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FINAL NO ACTION DECISION DOCUMENT LAGUNA LA CHIVA ATLANTIC FLEET WEAPONS TRAINING AREA FORMER VIEQUES NAVAL TRAINING RANGE VIEQUES ISLAND PUERTO RICO

09/01/2014

CH2M HILL

Final

No Action Decision Document
Laguna La Chiva

Atlantic Fleet Weapons Training Area-Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

Contract Task Order 037

September 2014

Prepared for

Department of the Navy
Naval Facilities Engineering Command
Atlantic

Under the

NAVFAC CLEAN 1000 Program
Contract N62470-08-D-1000

Prepared by

CH2MHILL

Virginia Beach, Virginia

Executive Summary

This Decision Document provides formal concurrence among the stakeholder agencies (United States Navy [Navy], Environmental Protection Agency [EPA] Region 2, Puerto Rico Environmental Quality Board [PREQB], and United States Fish and Wildlife Service [USFWS]) that no action is necessary at Laguna La Chiva, located within the former Vieques Naval Training Range (VNTR), under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). **Figure ES-1** shows the geographic location of Vieques, including the former VNTR, in relation to mainland Puerto Rico and the surrounding islands. The location of Laguna La Chiva is shown in **Figure ES-2**.

The no action determination made for Laguna La Chiva is based on an understanding of historical site uses, potential contaminant sources, and potential CERCLA-related release mechanisms; site visit observations; and collection and evaluation of site-specific environmental media samples. **Table ES-1** summarizes the information upon which the no action determination has been made for Laguna La Chiva. More detailed discussion is presented in Section 2 of this Decision Document.

NOTE: THIS SUMMARY IS PRESENTED IN ENGLISH AND SPANISH FOR THE CONVENIENCE OF THE READER. EVERY EFFORT HAS BEEN MADE FOR THE TRANSLATIONS TO BE AS ACCURATE AS REASONABLY POSSIBLE. HOWEVER, READERS SHOULD BE AWARE THAT THE ENGLISH VERSION OF THE TEXT IS THE OFFICIAL VERSION.

NOTA: ESTE RESUMEN SE PRESENTA EN INGLÉS Y EN ESPAÑOL PARA LA CONVENIENCIA DEL LECTOR. SE HA HECHO TODO LO POSIBLE PARA QUE LA TRADUCCIÓN SEA PRECISA EN LO MÁS RAZONABLEMENTE POSIBLE. SIN EMBARGO, LOS LECTORES DEBEN ESTAR AL TANTO QUE EL TEXTO EN INGLÉS ES LA VERSIÓN OFICIAL.

TABLE ES-1
Summary of Conclusions and Recommendations
Laguna La Chiva No Action Decision Document
Former Vieques Naval Training Range
Vieques, Puerto Rico

Site Name	Site Description	Site History	Potential Source(s)	Potential Release Mechanism(s)	Site-specific Data Collected	Results of 7-step Decision Analysis	Rationale for No Action/No Further Action Determination
Laguna La Chiva	Laguna La Chiva is an approximately 10 acre shallow marine lagoon located just north of Playa La Chiva. The general vicinity of the lagoon was historically used as a military training area for beach landings.	Site evaluated during an Environmental Baseline Survey (EBS), a National Oceanic and Atmospheric Administration (NOAA) crab tissue study, a NOAA marine ecosystem characterization, investigation of nearby former Camp Garcia landfill (SWMU 1) north (upgradient) of the lagoon, and a Site Inspection (SI).	Normal pesticide use associated with historical military training, drum remnants along the western lagoon shore, and upgradient SWMU 1.	Runoff from upland areas surrounding the lagoon, release from remnant drums, and transport via ephemeral streams from SWMU 1.	Sixteen sediment samples (representing 12 locations) and 7 soil samples were collected during the SI.	Data suggest potential source areas were sufficiently characterized	Data suggest the existing sediment and soil constituent concentrations do not pose a potentially unacceptable risk to human or ecological receptors.

(\\Managed.local\critigen\Projects) R:\USNavFacEngCom405450\Vieques\MapFiles\PI_21_Site_Features\Figure 1-1 - Regional Location Map.mxd10/2/2013celeftheriadis

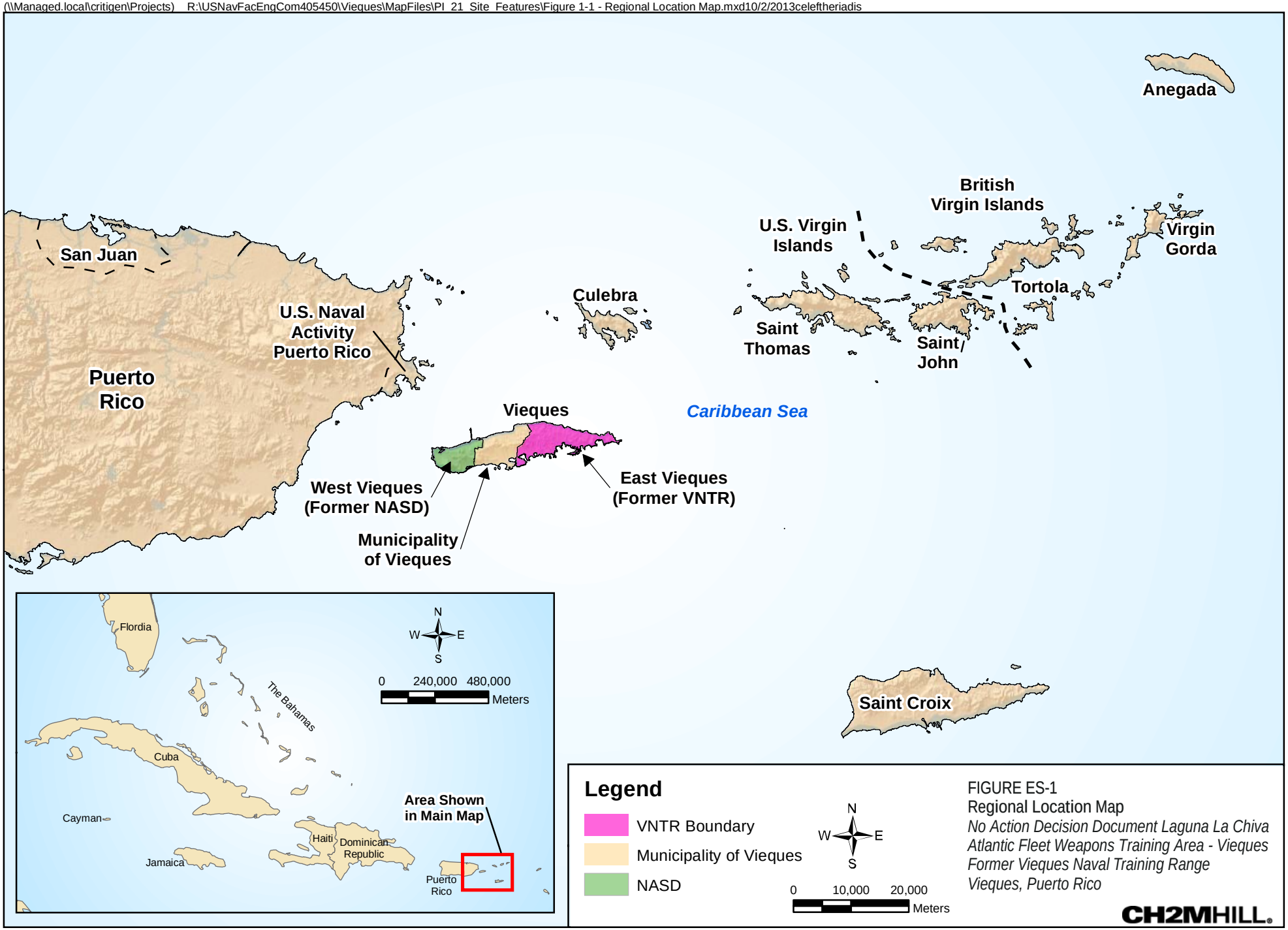

FIGURE ES-1
Regional Location Map
No Action Decision Document Laguna La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

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ES121113032416TPA ES-1 Regional Location Map.ai

(\\mnustrictgfs01\ctg$\projects) R:\USNavFacEngCom405450\Vieques\MapFiles\La_Chiva_Lagoon_NADD\FigureES-2_La_Chiva_Lagoon_SiteLocationMap.mxd7/24/2014

Legend

- Drum Remnants
- Ephemeral Stream
- Topographic Contour (1 Meter Interval)
- Topographic Contour (10 Meter Interval)
- SWMU 1

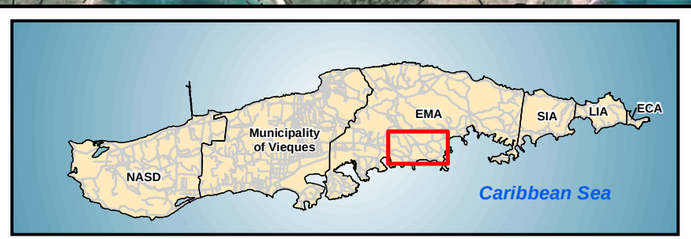

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Figure ES-2
Laguna La Chiva Site Location Map
No Action Decision Document Laguna La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

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Resumen Ejecutivo

Este Documento de Decisión provee concurrencia formal entre las agencias interesadas (Marina de los EE.UU. [Marina], la Agencia de Protección Ambiental [EPA, por sus siglas en inglés] Región 2, la Junta de Calidad Ambiental [JCA, o PREQB, por sus siglas en inglés], y el Servicio de Pesca y Vida Silvestre de los EE.UU. [USFWS, por sus siglas en inglés] de que ninguna acción es necesaria en Laguna La Chiva, localizada dentro del Antiguo Campo de Adiestramiento Naval de Vieques (VNTR, por sus siglas en inglés), bajo la Ley de Respuesta, Compensación y Responsabilidad Ambiental (CERCLA, por sus siglas en inglés). La **Figura ES-1** muestra la ubicación geográfica de Vieques, incluyendo el antiguo VNTR, en relación a la isla principal de Puerto Rico e islas circundantes. La localización de la Laguna La Chiva se muestra en la **Figura ES-2**.

La determinación de no acción tomada para la Laguna La Chiva es basada en el entendimiento de los usos históricos del sitio, fuentes potenciales de contaminación, y los mecanismos potenciales de descarga regulados bajo la ley CERCLA; observaciones durante visitas al sitio; y la colección y evaluación de muestras de los medios ambientales en el sitio. La **Tabla ES-1** resume la información bajo la cual la determinación de no acción fue tomada para la Laguna La Chiva. Se presenta una discusión más detallada en la Sección 2 de este Documento de Decisión.

NOTE: THIS SUMMARY IS PRESENTED IN ENGLISH AND SPANISH FOR THE CONVENIENCE OF THE READER. EVERY EFFORT HAS BEEN MADE FOR THE TRANSLATIONS TO BE AS ACCURATE AS REASONABLY POSSIBLE. HOWEVER, READERS SHOULD BE AWARE THAT THE ENGLISH VERSION OF THE TEXT IS THE OFFICIAL VERSION.

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TABLA ES-1

Resumen de Conclusiones y Recomendaciones

Documento de Decisión de No Acción para la Laguna La Chiva

Antiguo Campo de Adiestramiento Naval de Vieques

Vieques, Puerto Rico

Nombre del Sitio	Descripción del Sitio	Historia del Sitio	Fuente(s) Potencial(es)	Mecanismo(s) Potencial(es) de Liberación	Datos Recolectados en el Sitio	Resultados del Análisis de Decisión de 7-Pasos	Razón Fundamental para la Determinación de No Acción/No Acción Adicional
Laguna La Chiva	Laguna La Chiva es una laguna marina de poca profundidad que cubre aproximadamente 10 acres y está localizada justo al norte de Playa La Chiva. Las inmediaciones generales de la laguna fueron usadas históricamente como un área de adiestramiento militar para desembarcos en la playa.	El sitio fue evaluado durante un Estudio Ambiental Base (EBS, por sus siglas en inglés), un estudio de tejidos de cangrejo por la Administración Nacional Oceánica y Atmosférica de los EE. UU. (NOAA, por sus siglas en inglés), una caracterización del ecosistema marino por la NOAA, una investigación del antiguo vertedero cercano del Campamento García (SWMU 1) al norte (gradiente arriba) de la laguna, y una Inspección del Sitio (SI, por sus siglas en inglés).	Uso normal de pesticidas asociado con adiestramientos militares históricos, remanentes de barriles a lo largo de la orilla oeste de la laguna, y el SWMU 1 gradiente arriba.	Escorrentía desde las áreas altas en los alrededores de la laguna, descarga de los barriles remanentes, y transporte a través de corrientes efímeras desde SWMU 1.	Dieciséis muestras de sedimento (representando 12 localizaciones) y 7 muestras de suelo fueron colectadas durante el SI.	Los datos sugieren que las áreas de fuente(s) potencial(es) fueron suficientemente caracterizadas.	Los datos sugieren que las concentraciones de constituyentes existentes en sedimento y suelos no representan un riesgo potencial inaceptable para los receptores humanos o ecológicos.

Contents

Section **Page**

Executive Summary ..... **iii**

Resumen Ejecutivo ..... **v**

Acronyms and Abbreviations ..... **ix**

Declaration ..... **xi**

1 Introduction **1-1**

2 Decision Summary **2-1**

2.1 Site Background 2-1
2.2 Investigation History 2-1
2.2.1 Environmental Baseline Survey 2-1
2.2.2 NOAA Crab Tissue Study 2-2
2.2.3 NOAA Marine Ecosystem Characterization 2-2
2.2.4 SWMU 1 2-3
2.2.5 Laguna La Chiva Site Inspection 2-3
2.3 Conceptual Site Model 2-4
2.3.1 Physical Characteristics 2-4
2.3.2 Potential Contaminant Sources and Release/Transport Mechanisms 2-4
2.3.3 Future Land Use and Potential Receptors 2-5
2.4 Laguna La Chiva Release Assessment Decision Analysis 2-5
2.5 Conclusions and No Action Determination 2-11

3 References **3-1**

Appendices

A Analytical Results
B Data Quality Evaluation
C Human Health Risk Assessment
D Ecological Risk Assessment
E Data Validation Reports
F Final Responses to Agency Comments

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

ES-1 Summary of Conclusions and Recommendations
2-1 Laguna La Chiva Sediment Detection and Exceedance Results
2-2 Laguna La Chiva Soil Detection and Exceedance Results

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

ES-1 Regional Location Map
ES-2 La Chiva Lagoon Site Location Map
1-1 Regional Location Map
1-2 Laguna La Chiva Site Location Map
2-1 Laguna La Chiva NOAA Crab Sample Locations
2-2 Laguna La Chiva NOAA Sediment Sample Locations
2-3 SWMU 1 Ephemeral Stream Soil Samples
2-4 Laguna La Chiva Soil and Sediment Sample Pesticide Results
2-5 Site Inspection Evaluation Decision Tree

Acronyms and Abbreviations

AOC	Area of Concern
ATSDR	Agency for Toxic Substances and Disease Registry
BERA	baseline ecological risk assessment
CCP	Comprehensive Conservation Plan
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CLEAN	Comprehensive Long-term Environmental Action—Navy
COC	chemicals of concern
COPC	chemicals of potential concern
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethene
DDT	dichlorodiphenyltrichloroethane
DOI	Department of Interior
EBS	Environmental Baseline Survey
ECA	Eastern Conservation Area
ELCR	excess lifetime cancer risk
EMA	Eastern Maneuver Area
EqPs	equilibrium partitioning values
ERI	Environmental Research Inc.
ERM	effects range-median
ERP	Environmental Restoration Program
ESV	ecological screening value
HHRA	human health risk assessment
HI	Hazard Index
HQ	hazard quotient
LIA	Live Impact Area
LOAEL	lowest observed adverse effect level
µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
MATC	maximum acceptable toxicant concentration
NASD	Naval Ammunition Support Detachment
NAVFAC	Naval Facilities
NAVFACENGCOM	Naval Facilities Engineering Command
Navy	United States Navy
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
PAH	polycyclic aromatic hydrocarbons
PAOC	Potential Area of Concern
PCB	polychlorinated biphenyl
PEL	probable effects limit
PHC	Public Health Consultation
PI	photo identified

PPT	parts per thousand
PREQB	Puerto Rico Environmental Quality Board
ROD	Record of Decision
RSL	Regional Screening Level
SB	subsurface sample
SD	sediment sample
SERA	screening ecological risk assessment
SI	Site Investigation
SIA	Surface Impact Area
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TOC	total organic carbon
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
US Navy	United States Department of the Navy
VNTR	Vieques Naval Training Range

Declaration

The United States Department of the Navy (US Navy), in partnership with the United States Environmental Protection Agency (USEPA), Puerto Rico Environmental Quality Board (PREQB), and United States Fish and Wildlife Service (USFWS), has determined, based on the information contained within this Decision Document, that no further investigative activities are warranted and that no action is necessary to be protective of human health and the environment at Laguna La Chiva.

8/27/14

Kevin Cloe, Navy Remedial Project Manager

Date

Declaration

The United States Department of the Navy (US Navy), in partnership with the United States Environmental Protection Agency (USEPA), Puerto Rico Environmental Quality Board (PREQB), and United States Fish and Wildlife Service (USFWS), has determined, based on the information contained within this Decision Document, that no further investigative activities are warranted and that no action is necessary to be protective of human health and the environment at Laguna La Chiva.

8/28/2014

Daniel Rodriguez, USEPA Remedial Project Manager

Date

Declaration

The United States Department of the Navy (US Navy), in partnership with the United States Environmental Protection Agency (USEPA), Puerto Rico Environmental Quality Board (PREQB), and United States Fish and Wildlife Service (USFWS), has determined, based on the information contained within this Decision Document, that no further investigative activities are warranted and that no action is necessary to be protective of human health and the environment at Laguna La Chiva.

Wilmarie Rivera 8/29/2014

Wilmarie Rivera, PREQB Remedial Project Manager Date

Declaration

The United States Department of the Navy (US Navy), in partnership with the United States Environmental Protection Agency (USEPA), Puerto Rico Environmental Quality Board (PREQB), and United States Fish and Wildlife Service (USFWS), has determined, based on the information contained within this Decision Document, that no further investigative activities are warranted and that no action is necessary to be protective of human health and the environment at Laguna La Chiva.

Susan Silander, USFWS Remedial Project Manager

8/29/2014
Date

SECTION 1

Introduction

This Decision Document provides formal concurrence among the stakeholder agencies (United States Navy [Navy], United States Environmental Protection Agency [USEPA] Region 2, the Commonwealth of Puerto Rico Environmental Quality Board [PREQB], and the United States Fish and Wildlife Service [USFWS]) that no action is necessary at Laguna La Chiva, located within the former Vieques Naval Training Range (VNTR), under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (**Figures 1-1 and 1-2**). The former VNTR is part of the Atlantic Fleet Weapons Training Area – Vieques, which was placed on the National Priorities List (NPL) on February 11, 2005 (Comprehensive Environmental Response, Compensation, and Liability Information System [CERCLIS] National Superfund database identification number: PRN000204694).

This No Action Decision Document was prepared under the Navy Comprehensive Long-Term Environmental Action (CLEAN) Contract N62470-08-D-1000, Contract Task Order 0037, for submittal to the Naval Facilities Engineering Command (NAVFACENGCOM) Atlantic Division, USEPA Region 2, PREQB, and USFWS. The Navy, USEPA, PREQB, and USFWS work jointly as the Vieques CERCLA Environmental Restoration Program (ERP) Technical Subcommittee.

Laguna La Chiva is not a formal CERCLA site; however, military training activities were historically conducted in the vicinity of the approximately 10-acre lagoon. Playa La Chiva (a.k.a., Blue Beach), to the south of the lagoon, was one of the two most frequently used beaches for amphibious landing training (TAMS, 1979). In addition, Solid Waste Management Unit (SWMU) 1 (the former Camp Garcia landfill) is located hydraulically upgradient of Laguna La Chiva (**Figure 1-2**). In addition, as part of a 2007 island-wide characterization of Vieques' marine ecosystems, the National Oceanic and Atmospheric Administration (NOAA) collected sediment samples from Laguna La Chiva in which pesticides (primarily 4,4'-dichlorodiphenyltrichloroethane [DDT], 4,4'-dichlorodiphenyldichloroethane [DDE], and 4,4'-dichlorodiphenyldichloroethylene [DDD]) were detected at concentrations higher than at other Vieques lagoons and above ecological screening values (NOAA, 2010). Remnants of several steel drums were observed in Laguna La Chiva during various site surveys.

Based on the above information, the ERP Technical Subcommittee concurred a Site Inspection (SI) was warranted for Laguna La Chiva. The remainder of this Decision Document presents site-specific detail for Laguna La Chiva, including pertinent historical information and analytical data evaluation, followed by the rationale upon which the no action determination is based.

(\\Managed.local\critigen\Projects) R:\USNavFacEngCom405450\Vieques\MapFiles\PI_21_Site_Features\Figure 1-1 - Regional Location Map.mxd10/2/2013celeftheriadis

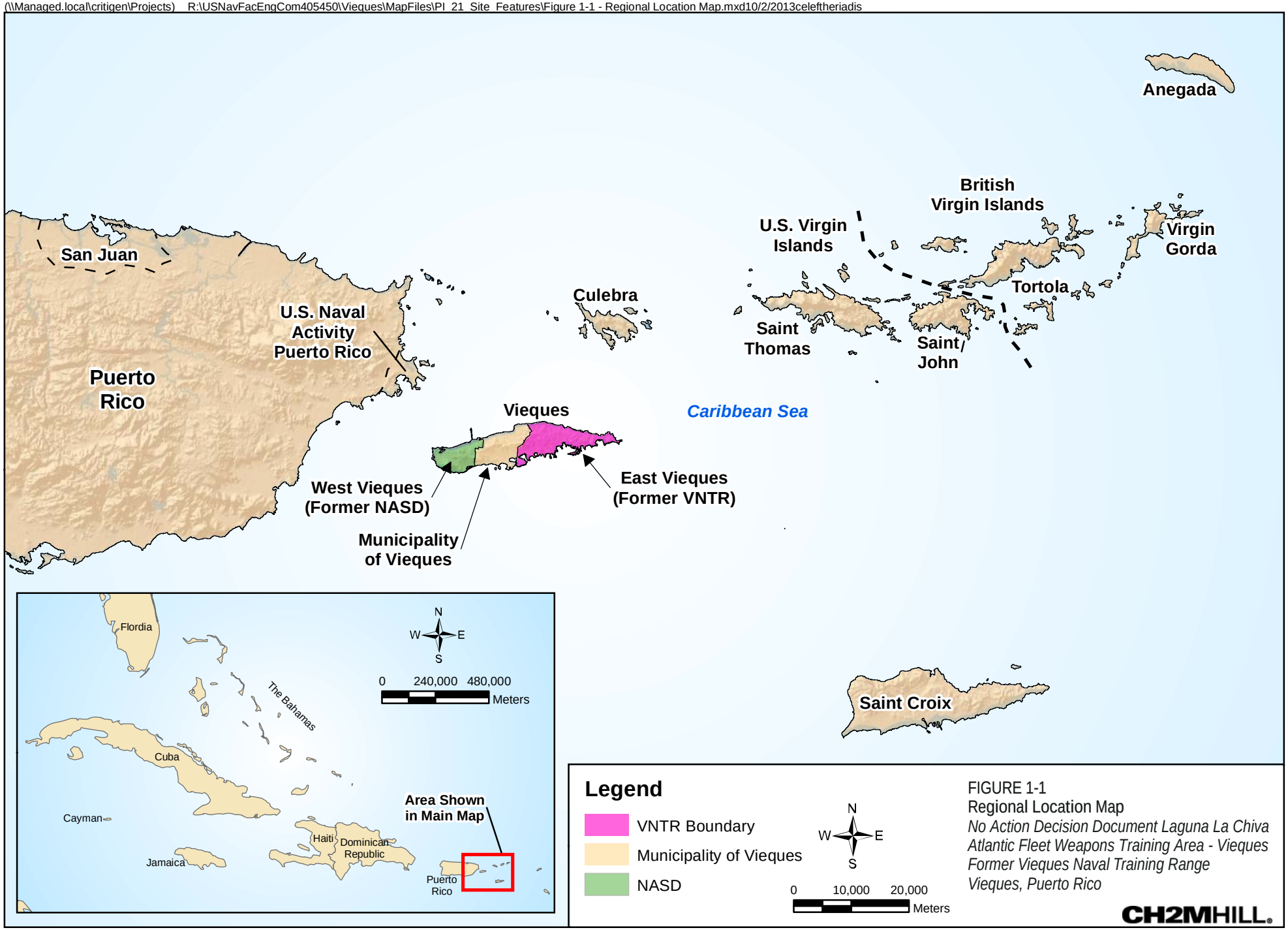

FIGURE 1-1
Regional Location Map
No Action Decision Document Laguna La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

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ES121113032416TPA F1-1 Regional Location Map.ai

(\\mnustrictgfs01\ctg$\projects) R:\USNavFacEngCom405450\Vieques\MapFiles\La_Chiva_Lagoon_NADD\Figure1-2_La_Chiva_Lagoon_SiteLocationMap.mxd7/24/2014

Legend

- Drum Remnants
- Ephemeral Stream
- Topographic Contour (1 Meter Interval)
- Topographic Contour (10 Meter Interval)
- SWMU 1

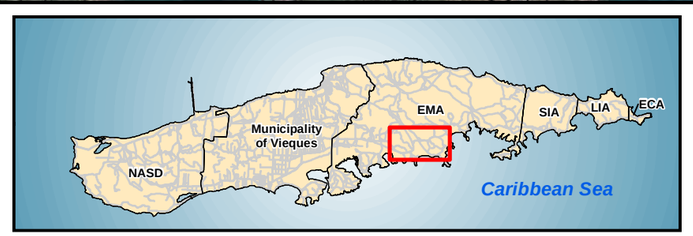

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Figure 1-2
Laguna La Chiva Site Location Map
No Action Decision Document Laguna La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

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SECTION 2

Decision Summary

This section presents a summary of the pertinent historical information and rationale for the no action determination for Laguna La Chiva.

2.1 Site Background

Vieques Island is approximately 7 miles southeast of the eastern tip of the main island of Puerto Rico (**Figure 1-1**). Vieques is the largest island in the Commonwealth of Puerto Rico, encompassing 33,088 acres. The Navy purchased large portions of Vieques in the early 1940s to conduct military training activities. Operations within the Former Naval Ammunition Support Detachment (NASD; western quarter of Vieques) consisted mainly of ammunition loading and storage, vehicle and facility maintenance, and some training. Operations within the Former VNTR (eastern half of Vieques) comprised various aspects of naval gunfire training, including air-to–ground ordnance delivery and amphibious landings, as well as housing the main base of operations for these activities at Camp Garcia. The former VNTR is over 14,000 acres and comprises the Eastern Maneuver Area (EMA), Surface Impact Area (SIA), Live Impact Area (LIA), and Eastern Conservation Area (ECA).

As noted in Section 1, Laguna La Chiva is sandwiched between two areas of former military activities (**Figure 1-2**). Since the general vicinity of the lagoon was historically used as a training area for beach landings, it is very likely to have involved spraying DDT for control of adult and larval mosquitoes and other insect pests (e.g., biting midges [“no-see-ums”]), especially due to the presence of the lagoon where mosquitoes and biting midges breed. Though there are no records available, a likely source of pesticides in Laguna La Chiva may be normal pesticide application during training activities; however rusted remnants of drums identified within the lagoon and the SWMU 1 landfill located hydraulically upgradient of the lagoon were also recognized as potential sources.

In 2012, during refurbishment by USFWS of the bridge along Route 104 where it crosses Laguna La Chiva, soil from the bank with some sediment from the southern arm of the lagoon was dredged and stockpiled west of Laguna La Chiva. The dredging did not take place in the area where sediment samples containing elevated pesticide concentrations were collected by NOAA.

2.2 Investigation History

The Navy ceased training exercises at the Former VNTR on April 30, 2003, in accordance with the Presidential Directive to the Secretary of Defense on January 30, 2000, when the land was transferred to the Department of Interior (DOI), to be managed by the USFWS as a National Wildlife Refuge. Although the DOI is directed to protect and conserve the transferred land as a wildlife refuge, the Navy retains the responsibility for conducting environmental investigations and clean-up of the property, as warranted.

Environmental investigations conducted at or in the vicinity of Laguna La Chiva include an Environmental Baseline Survey (EBS) in 2003, a NOAA crab tissue study in 2005, a NOAA island-wide marine ecosystem characterization in 2007, and an SI in 2013. A summary of each investigation is provided below.

2.2.1 Environmental Baseline Survey

During the EBS, Potential Area of Concern (PAOC) W was identified as an area of stagnant, discolored water where the road to Playa La Chiva crosses the southern arm of Laguna La Chiva (NAVFAC, 2003). An evaluation of mangrove forest health noted a significant decline in mangrove density in Laguna La Chiva, but attributed this to a variety of influences such as hurricane impacts, sediment accumulation, reduced inflow of freshwater, and limited or blocked circulation with the sea (Geo-Marine, 2002). Since mangroves contain large amount of tannins, the observation of discolored water was likely the result of tannins leached from mangrove leaves which is a natural process common in lagoons, and when there is limited flushing of lagoon water the dark color associated with the tannins can build. Observations made during a site visit performed

by representatives of the Navy, USEPA, PREQB, USFWS, and National Oceanic and Atmospheric Administration (NOAA) in 2007 supported these findings. Therefore, a no action determination was made for PAOC W, which is documented in the No Action Decision Document for 4 Consent Order Sites and 6 PI/PAOC Sites (CH2M HILL, 2009).

2.2.2 NOAA Crab Tissue Study

In 2005, NOAA collected fiddler crab (*Uca* spp.) and land crab (*Cardisoma guanhumi*) tissue samples from mudflats, mangrove wetlands, coastal forested areas, and sandy areas on the east and west ends of Vieques Island, including around Laguna La Chiva (NOAA and Ridolfi, 2006) (**Figure 2-1**). The primary purpose of the NOAA investigation was to characterize concentrations of explosive compounds, polychlorinated biphenyls (PCBs), organochlorine pesticides, and trace elements in these species. While pesticides were detected in crab tissue, the Public Health Consultation (PHC) prepared by the Agency for Toxic Substances and Disease Registry (ATSDR), in part using the NOAA data, stated that the level of pesticides found in the land crab samples were much lower than levels reported to cause harmful health effects (ATSDR, 2006). In addition, NOAA evaluated the data and concluded that the pesticide concentrations in crabs did not exceed ecological screening values intended for the protection of crustaceans.

2.2.3 NOAA Marine Ecosystem Characterization

In 2007, NOAA collected sediment samples from 78 near-shore and inland lagoon locations around Vieques (NOAA, 2010). These data were collected as part of an island-wide characterization of Vieques' marine ecosystems, during which three of the inland lagoon sediment samples were collected from Laguna La Chiva (**Figure 2-2**); results for the three samples showed the following:

- Pesticides – pesticides (primarily DDT, DDE, and DDD) were detected at concentrations higher than at other lagoons on Vieques. Concentrations of DDT and DDD exceeded their respective ecological screening levels in all three samples, while DDE exceeded its ecological screening level in two samples. No pesticides exceeded USEPA Regional Screening Levels (RSLs).
- Polychlorinated Biphenyls (PCBs) – PCBs were detected at concentrations much lower than the National Status and Trends mean values for the rest of US coastal waters (NOAA, 2010) and lower than or comparable to PCB concentrations detected throughout NOAA's Vieques-wide sediment samples (i.e., not likely related specifically to Laguna La Chiva). Most importantly, no PCBs exceeded ecological screening levels or USEPA RSLs.
- Polycyclic Aromatic Hydrocarbons (PAHs) – PAHs, a subset of semi-volatile organic compounds (SVOCs), were analyzed in accordance with NOAA's National Status and Trends protocol. While PAHs were detected in Laguna La Chiva sediment samples, all concentrations were lower than or comparable to National Status and Trends median values for the rest of US coastal waters (NOAA, 2010) and generally lower than or comparable to the PAH concentrations detected throughout NOAA's sediment samples (i.e., not likely related specifically to Laguna La Chiva). In fact, the NOAA report concluded: "Overall, the concentrations of total PAHs in sediments were low; none of the concentrations of total PAHs exceeded the sediment quality guidelines examined." Most importantly, none of the PAH concentrations detected in Laguna La Chiva sediment samples exceeded ecological screening levels or USEPA RSLs. Based on this multiple-lines-of-evidence approach, PAHs were determined not to warrant further consideration as potential contaminants of concern.
- Butyltins – Butyltins are a class of compounds more typically used as biocides, such as tributytlin which was historically incorporated into antifoulant paints such as on boat hulls. Butyltins were detected in sediment at concentrations lower than or comparable to butyltin concentrations detected throughout NOAA's island-wide data set (i.e., not likely related specifically to Laguna La Chiva). Most importantly no tributyltin was detected and none of the butyltin concentrations exceeded ecological screening levels or USEPA RSLs.

- Explosives – No explosives were detected.
- Metals – Metals were detected in Laguna La Chiva samples, but no sediment concentrations were above probable effects limit (PEL) or effects range-median (ERM) sediment quality guideline concentrations which would have indicated that effects were likely in sediment-inhabiting organisms.

Based on the above information, the pesticides DDD, DDE, and DDT were identified by the ERP Technical Subcommittee as the only potential contaminants of interest for further evaluation in the SI. Pesticides (other than DDD, DDE, and DDT), PCBs, PAHs, butyltins, explosives, and metals were eliminated by the ERP Technical Subcommittee as potential contaminants of interest for further evaluation because they were either not detected or were detected below ecological and human health risk-based screening levels.

2.2.4 SWMU 1

In March 2009, as part of an investigation of the former Camp Garcia landfill (SWMU 1), the Navy collected surface and subsurface soil samples from depositional areas within two ephemeral streams upgradient of Laguna La Chiva (**Figure 2-3**) to determine if hazardous constituents had been released to the streams. As shown in the figure, DDD, DDE, and DDT were not detected in the most downgradient stations representing the western and eastern ephemeral streams; stations SS26 and SB27, respectively. Upgradient ephemeral stream stations SS25 and SS24 contained DDD, DDE, and DDT at concentrations below human health and ecological screening levels; thus, there is no evidence from recent (2009) data of pesticide transport from SWMU 1 downstream into Laguna La Chiva. Additional detail regarding the investigation of SWMU 1 is presented in the *Streamlined Remedial Investigation/Feasibility Study Report, Solid Waste Management Unit 1 (SWMU 1), Former Vieques Naval Training Range, Vieques, Puerto Rico* (CH2M HILL, 2011).

2.2.5 Laguna La Chiva Site Inspection

The Laguna La Chiva SI was conducted in 2013 during which 16 sediment samples (representing 12 locations) across Laguna La Chiva and 7 soil samples within the surrounding upland were collected (**Figure 2-4**), all in accordance with the Sampling and Analysis Plan (CH2M HILL, 2013). The rationale for the locations, depths, and analyses of the samples is as follows:

Twelve sediment locations were selected to provide broad spatial coverage across the lagoon to help determine if there are any patterns of pesticide (or other contaminants) distribution. All sediment samples were analyzed for pesticides (DDD, DDE, and DDT), VOCs, SVOCs (less PAHs), total organic carbon (TOC), pH, and grain size. At all locations, sediment was collected from the top 6 inches, except as noted in the fifth bullet below.

- Sample locations SD01, SD02, SD03, and SD12 were placed to help evaluate potential transport of contaminants (primarily pesticides) from upgradient SWMU 1 or surrounding areas to the lagoon via the western ephemeral stream. Similarly, sample locations SD11, SD10, and SD09 were placed to perform the same function for the eastern ephemeral stream.
- Sample locations SD02, SD03, and SD12 were placed to help evaluate potential releases from remnant drums observed in those areas.
- Sample locations SD04, SD05, SD07, and SD08 were placed to help confirm the historical pesticide concentrations reported at NOAA sampling stations 46P, 47P, and 115S3A.
- Sample location SD06 was placed to evaluate sediment (together with sample SD07) near the public fishing pier on the vehicle bridge across the southern arm of the lagoon.
- At four of the sediment sampling locations (SD01, SD02, SD04, and SD11) both shallow (top 6 inches) and deep (6 to 12 inches) sediment samples were collected to evaluate whether there were higher concentrations in the deeper sediments, potentially corresponding to sediment present at or closer to the surface when the Navy training activities (including normal pesticide application to control insect pests) were taking place.

Seven surface soil samples were collected in areas surrounding the lagoon (**Figure 2-4**) and analyzed for pesticides (DDD, DDE, and DDT), TOC, pH, and grain size. The locations of the soil samples were selected to provide broad spatial coverage around the lagoon, as well as target specific features.

- Sample location SS01 was placed adjacent to where NOAA detected the highest pesticide concentrations in sediment, and is also within an area where land crabs occur. Land crab habitat occurs within most of the forested lagoon perimeter; however, samples SS05 and SS07 were collected to conservatively target land crab habitat within the southern perimeter where historic military training operations frequently occurred and where normal terrestrial pesticide application most likely occurred. Samples were collected from 0 to 24 inches at these land crab habitat stations.
- Sample locations SS02, SS03, SS04, and SS06 were placed in lagoon perimeter salt flat areas to evaluate pesticide concentrations in nearshore upland environments. These salt flats do not contain land crab habitat; therefore, soil samples were collected from 0 to 12 inches at these stations.

2.3 Conceptual Site Model

2.3.1 Physical Characteristics

Laguna La Chiva is an approximately 10-acre estuarine lagoon. Under current (normal) conditions, the hydrologic connection to the Caribbean Sea at the southern end of the lagoon is blocked by a large accumulation of sand at Playa La Chiva, and this appears to be a well established barrier to the sea that is infrequently breached by strong storm events. The interior of the lagoon contains extensive shallow water and large exposed mud flats and salt flats with sparse mangrove vegetation. Historically, this lagoon was dominated by mangroves, but a significant decrease in mangrove cover has occurred over time, likely the result of long-term blocked circulation with the sea resulting in increased lagoon salinity and the associated adverse effects on some mangrove species. Lagoon sediment, as evaluated during the SI, is characterized as predominantly soft silt/clay (92%) with a small amount of sand (8%). Average total organic carbon is 4.3%. Upland soils around the lagoon perimeter comprise silt/clay (59%) and sand (41%). The geology of the area is alluvial marsh deposits likely underlain by Cretaceous sandstones, and/or siltstones, and/or volcanics. The groundwater level is likely at the level of the lagoon, or within a few inches of this level. Average surface water characteristics measured during the SI included dissolved oxygen ranging from 4.9 to 6.6 milligrams per liter (mg/L), temperature ranging from 26.4 to 26.6 °C, salinity ranging from 38.9 to 39.5 parts per thousand (ppt), and pH ranging from 7.69 to 7.71 standard units.

The climate of Vieques is characterized as warm and humid (tropical-marine). Temperatures are nearly constant with an annual average temperature of about 79 °F; August is the warmest month, with an average temperature of 82 °F and February the coolest, with an average temperature of 76 °F. Vieques lies in the path of the prevailing easterly trade winds, regulating the climate. The trade winds result in a rainfall pattern characterized by a dry season from December through April and a rainy season from May through November. Due to tropical low pressure systems carried by the trade winds, heavy precipitation results from tropical storms and occasional hurricanes from July to November. The island's average rainfall is approximately 36 inches, with extremes of 25 inches in the east and 45 to 50 inches in the west.

Laguna La Chiva is an approximately 10-acre estuarine lagoon located in a low-lying area at an elevation less than 3 ft above mean sea level (**Figure 1-2**). Two ephemeral streams drain into the lagoon. Under current (normal) conditions, the hydrologic connection to the Caribbean Sea at the southern end of the lagoon is blocked by a large accumulation of sand at Playa La Chiva, and this appears to be a well-established barrier to the sea that is infrequently breached by strong storm events, as evident through time on historical aerial photographs. The lagoon water level varies based on the amount of precipitation.

2.3.2 Potential Contaminant Sources and Release/Transport Mechanisms

Potential sources of pesticides include (1) normal historical application during military training activities in the area, (2) leakage from historically disposed drums within the lagoon, and (3) migration of pesticides via

two ephemeral streams from upgradient SWMU 1. As discussed in Section 2.2.4, an RI was conducted at SWMU 1 to evaluate the nature and extent of contamination and the potential for contaminants to migrate downgradient of the site within the ephemeral streams. The RI/FS Report provides detail description of SWMU 1 and concluded that there was no evidence of contamination from the SWMU being transported along the ephemeral streams (CH2M HILL, 2011).

2.3.3 Future Land Use and Potential Receptors

The former VNTR was transferred to the DOI in 2003 to be managed by USFWS as part of the National Wildlife Refuge System, pursuant to Section 1049 of the National Defense Authorization Act for Fiscal Year 2002 (Public Law 107-107). A Comprehensive Conservation Plan (CCP) for the Vieques National Wildlife Refuge was completed by USFWS, which outlines the land use plan for managing the former VNTR as a wildlife refuge (DOI, 2007). Laguna La Chiva is managed and protected as part of the wildlife refuge. As a result, associated workers may access the lagoon and conduct various maintenance or construction activities. Although the site will not be developed for residential use, a residential scenario was included in the HHRA to evaluate the unrestricted land use scenario. The vehicle bridge over the southwest end of the lagoon includes a public fishing pier; thus, recreational fishing/crabbing can occur at this access point. Though public access to the remainder of the lagoon perimeter is not restricted, shoreline access is significantly impeded due to the lack of trails through the thick and thorny vegetation that surrounds the lagoon and USFWS currently does not have plans to foster access around the lagoon. Playa La Chiva, a popular beach just south of the lagoon, is currently open to the public and allows direct access to about 100 feet of open shoreline at the southern end of Laguna La Chiva where fishing or wading could occur.

A qualitative biological survey conducted during the SI identified several species of fish in the lagoon including snook (*Centropomus* sp.), tarpon (*Megalops atlanticus*), ladyfish (*Elops saurus*), white mullet (*Mugil curema*), and mojarra (*Eucinostomus* spp.). Blue crabs (*Calinectes sapidus*) and fiddler crabs (*Uca* sp.) are common in shallow water and mudflats throughout the lagoon. Common aquatic birds include clapper rail (*Rallus longirostris*), multiple shorebird species (yellowlegs [*Tringa* spp.], spotted sandpiper [*Actitis macularius*], black-bellied plover [*Pluvialis squatarola*], and ruddy turnstone [*Arenaria interpres*]), and herons (little blue heron [*Egretta caerulea*], snowy egret [*Egretta thula*], and green heron [*Butorides virescens*]). The white-cheeked pintail (*Anas bahamensis*), a Puerto Rico vulnerable species, has also been observed occasionally.

The low-lying fringe of the lagoon contains a mix of unvegetated mud and salt flats, areas of dense saltwort (*Batis maritima*), and patchy areas of black mangrove (*Avicennia germinans*) and some white mangrove (*Laguncularia racemosa*). Red mangroves (*Rhizophora mangle*) are only found lining the deeper channel at the southern end of the lagoon.

The vegetative community within the upland perimeter of Laguna La Chiva has historically been disturbed, and as a result the habitat is now dominated by low-growing, thick thorn scrub. The more common plant species include acacia (*Acacia* sp.), mesquite (*Prosopis juliflora*), white leadtree (*Leucaena glauca*), and box-briar (Randia aculeata). Common birds observed include common ground dove (*Columba passerina*), gray kingbird (*Tyrannus dominicensis*), bananaquit (*Coerba flaveola*), and yellow warbler (*Dendroica petechia*). The small Indian mongoose (*Herpestes auropunctatus*) has been observed occasionally. Land crab (*Cardisoma guanhumi*) burrows occur along most of the forested upland lagoon perimeter.

Thirteen federally listed species are known to occur, or have the potential to occur, on or near Vieques. None of these plants or animals have been identified within Laguna La Chiva, and designated critical habitat is not present at this site.

2.4 Laguna La Chiva Release Assessment Decision Analysis

Sixteen sediment samples (representing 12 locations) and 7 soil samples were collected during the SI (**Figure 2-4**). These samples provide sufficient coverage of potential contaminant sources at Laguna La Chiva to determine if a CERCLA-related release occurred at the site and whether further investigation or action is

warranted. Chemical constituents detected in the sediment and soil samples at Laguna La Chiva are summarized in **Table 2-1** (sediment) and **Table 2-2** (soil).

This subsection discusses the sample results in the context of the Data Evaluation Decision Tree (**Figure 2-5**).

Step 1: Is the site potentially CERCLA-eligible?

NOAA conducted an island-wide marine ecosystem evaluation in 2007 and found that the pesticides DDT, DDE, and DDD in Laguna La Chiva sediment were higher than at other lagoons on Vieques and above ecological screening values. Since the general vicinity of Laguna La Chiva was historically used as a frequent training area for beach landings, it is very likely to have involved spraying DDT for control of adult and larval mosquitoes and other insect pests. Though there are no records available, a likely source of pesticides in Laguna La Chiva may be normal pesticide application during training activities; however, rusted remnants of drums identified within the lagoon and the SWMU 1 landfill located hydraulically upgradient of the lagoon were also recognized as potential sources. Based on this information, the potential presence of CERCLA hazardous substance(s) could not be confidently ruled out without additional sample collection, which was conducted during the 2013 SI. Therefore, the decision analysis proceeds to Step 2.

Step 2: Does the data quality evaluation indicate the dataset as a whole is available and useful for the intended purpose?

The raw analytical data are provided in Appendix A. The data quality evaluation of the SI data is summarized in Appendix B. Based on the evaluation of the SI data, the 95% goal was met for each combination of matrix and analysis group with the exception of sediment SVOCs where 79.5% completeness was obtained. A total of 20.5% of the SVOC sediment data were R-qualified as “rejected” due to low recovery of a surrogate spike which is used to ensure target compounds are accurately recovered during the analytical process. The low recovery indicates there is a potential low bias due to matrix interference. Three of the 12 sediment stations (SD04, SD05, and SD06) were affected, comprising samples VENO-SD04-000H, VENO-SD04-0H01, VENO-SD05-000H, and VENO-SD06-000H. However, a number of SVOCs were still reportable (i.e., not rejected) in sample VENO-SD04-000H as non-detect. In addition, the 12 remaining sediment samples (representing 9 stations throughout the lagoon) had acceptable surrogate spike recoveries, and very significantly, SVOCs were non-detect for all results. In addition, PAHs detected in Laguna La Chiva sediment samples collected by NOAA, including in the vicinity of samples SD04, SD05, and SD06, were up to orders of magnitude below NOAA’s toxicological values and ecological and human health screening values used for Vieques sites. Further, there is no known or suspected source of an SVOC release to the lagoon; SVOC analysis was simply included because it had not been included in past sampling. Based on the above information, the rejected data do not represent a data gap that inhibits drawing conclusions and making determinations for Laguna La Chiva. Further, because the rejected results were due to matrix interferences, which is common in samples from settings such as Laguna La Chiva, additional samples from the area would likely result in similar matrix interferences. Therefore, the dataset as a whole is available and useful for the intended purpose of meeting the study objectives and making site-specific determinations.

Step 3: Were any pesticides, VOCs, or SVOCs detected?

For the samples collected during the SI (2013), the following were detected by medium:

Sediment (samples SD01 through SD12)

- Pesticides: DDD, DDE, and DDT
- VOCs: 2-butanone, acetone, bromoform, and carbon disulfide
- SVOCs: None detected

Surface Soil (samples SS01 through SS07)

- Pesticides: DDE

Step 4: Are there any pesticides, VOCs, or SVOCs that are potentially attributable to historic CERCLA-related releases at the site?

Sediment (samples SD01 through SD12)

As noted previously, the pesticide concentrations detected in Laguna La Chiva may very well be present due to normal pesticide application associated with the military training activities. However, they are carried forward in the decision analysis as a conservative measure due to the presence of the drum remnants and the location of the lagoon downgradient of the SWMU 1 landfill.

Four VOCs: 2-butanone, acetone, bromoform, and carbon disulfide were detected in sediment samples at low concentrations relative to screening levels (orders of magnitude below). 2-Butanone, acetone and bromoform are common laboratory contaminants and bromoform can also be produced by marine vegetation; carbon disulfide can be produced naturally by sediment microorganisms in wetlands. However, as a conservative measure, due to their other potential uses (e.g., solvents), they are carried forward in the decision analysis.

Surface Soil (samples SS01 through SS07)

Like the pesticides in sediment, the DDE detected in soil is retained for further evaluation in Step 5 as a conservative measure.

Step 5: Are there any exceedances of the most conservative screening values?

In this step of the decision analysis, the data for the CERCLA-related constituents identified in Step 4 are compared to the screening criteria shown on the detection tables (**Tables 2-1** and **2-2**). Those constituents that exceed one or more criteria are listed below.

Sediment

DDD: Nine detections (stations SD01 [0-6 and 6-12 inches], SD02 [0-6 inches only], SD03, SD04 [0-6 inches only], SD05, SD06, SD07, and SD12) at concentrations (between 2.6 J micrograms per kilogram (µg/kg) and 150 J µg/kg) above the Ecological Screening Value (ESV) (1.22 µg/kg).

DDE: Eight detections (stations SD01 [0-6 and 6-12 inches], SD02 [0-6 and 6-12 inches], SD03, SD04 [0-6 inches only], SD06, and SD12) at concentrations (between 11 J µg/kg and 41 J µg/kg) above the ESV (2.2 µg/kg).

DDT: Five detections (stations SD01 [0-6 and 6-12 inches], SD02 [0-6 inches], SD03, and SD12) at concentrations (between 3.2 J µg/kg and 210 J µg/kg) above the ESV (1.19 µg/kg).

VOCs: No exceedances

Surface Soil

DDE: One detection (station SS05) at a concentration (2,300 µg/kg) above the adjusted RSL for residential soil (1,400 µg/kg) and ESV (114 µg/kg).

As shown above, there are pesticide exceedances of the most conservative screening values in soil and sediment. Therefore, the decision analysis process continues to Step 6. It is noted here that in accordance with the Vieques Master Ecological Risk Assessment Protocol (CH2M HILL, 2010a and 2010b), detected constituents for which there are no ESVs are carried forward into quantitative ecological risk assessment (ERA). Although quantitative risk assessments are not standard components of SIs, the ERP Technical Subcommittee concurred during a preliminary review of the SI data during the August 2013 Technical Subcommittee meeting that quantitative risk assessments would be performed for the Laguna La Chiva SI. Therefore, because the four VOCs detected in Laguna La Chiva sediment do not have ESVs, they are carried forward into the ecological risk assessment performed in Step 6 of the decision analysis.

Step 6: Can more realistic evaluations of the data be performed, and if so, do they suggest contaminant levels that warrant no action?

As noted above, quantitative risk assessments were performed for the Laguna La Chiva SI; these risk assessments constitute the primary more realistic evaluation of the data and are summarized below. The full risk assessments are provided in **Appendix C** (human health) and **Appendix D** (ecological). In addition, a spatial evaluation of the pesticides detected in the lagoon is included in this step to help determine the likely source of the pesticides (i.e., normal pesticide application, release from drums, release from SWMU 1 landfill).

Human Health Risk Assessment

A human health risk assessment (HHRA) was conducted for Laguna La Chiva that evaluated potential/hypothetical current and future health risks from exposure to contaminants in site soil and sediment, and as modeled in the tissues of biota (fish and blue crab), based on the analytical data collected during the SI. Although the site will not be developed for residential use, a residential scenario was included in the HHRA to evaluate the unrestricted land use scenario.

The following chemicals of potential concern (COPCs), by medium and receptor group, were identified for surface soil and sediment using the screening process presented in the Vieques Master HHRA protocol (CH2M HILL, 2010a):

- Current/Future Recreational Users/Trespassers/Site Visitors:
  - DDE was identified as a COPC in surface soil for the direct contact exposure pathways.
  - No COPCs were identified in sediment for the direct contact exposure pathways.
- Future Residents
  - DDE was identified as a COPC in surface soil for the direct contact exposure pathways.
- Future Maintenance Workers/Industrial Workers/Construction Workers:
  - No COPCs were identified in surface soil for the direct contact exposure pathways.
- Current/Future Fish and Blue Crab Consumers:
  - Three pesticides (DDD, DDE, and DDT) were identified as COPCs for the fish/blue crab consumption pathways.

USEPA 's target (acceptable) range for excess lifetime cancer risk (ELCR) associated with CERCLA sites is 1-in-10,000 ($1x10^{-4}$) to 1-in-1,000,000 ($1x10^{-6}$). Similarly, the target (acceptable) non-cancer hazard index (HI) is 1 or less per target organ. Risk estimates were calculated for potential receptors and exposure pathways using conservative assumptions for exposure factors and exposure point concentrations. The risk estimates are summarized below:

- Recreational Users/Trespassers/Site Visitors – Current/Future Scenario – Surface soil (ingestion, dermal contact, and inhalation):
  - Adult: $2x10^{-7}$ ELCR
  - Youth: $1x10^{-7}$ ELCR
  - Child: $3x10^{-7}$ ELCR
- Fish Consumers – Current/Future Scenario – Fish (ingestion):
  - Adult: $3x10^{-5}$ ELCR, target organ-specific HI <1
  - Youth: $2x10^{-5}$ ELCR, target organ-specific HI <1
  - Child: $1x10^{-5}$ ELCR, target organ-specific HI <1
- Blue Crab Consumers (Adult) – Current/Future Scenario – Blue Crab (ingestion):
  - Adult: $5x10^{-5}$ ELCR, target organ-specific HI <1
  - Youth: $3x10^{-5}$ ELCR, target organ-specific HI <1

  - Child: $3x10^{-5}$ ELCR, target organ-specific HI <1

- Residents (Child/Adult) – Future Scenario Soil – Surface Soil (ingestion, dermal contact, and inhalation):
  - Adult/Child Aggregate: $2x10^{-6}$ cumulative ELCR

Chemicals of concern (COCs) are generally identified when the potential ELCR or HI for a receptor group exceeds USEPA threshold values (a total ELCR of $1x10^{-4}$ or a target organ-specific HI of 1) and concentrations are site-related and above background levels. For each receptor group, when a potential ELCR of $1x10^{-4}$ is exceeded for an environmental medium, the COPCs above background levels and posing an individual ELCR greater than $1x10^{-6}$ in that environmental medium are identified as COCs. When a potential target organ-specific HI exceeds 1 for an environmental medium, the COPCs above background levels and posing a hazard quotient (HQ) greater than 0.1 for the target organ in that environmental medium are identified as COCs. Factors such as nature of contamination source, laboratory contamination, and common pesticide use (unrelated to spills, improper storage disposal or use) are considered when identifying COCs.

ELCR and HI estimates for potential soil, sediment, and biota exposures at Laguna La Chiva were within USEPA -acceptable levels for all receptor groups. The potential ELCRs for the exposure scenarios evaluated at Laguna La Chiva were within or less than the target ELCR range of $1x10^{-6}$ to $1x10^{-4}$. Additionally, all estimated target organ-specific HIs were less than the threshold of 1. Therefore, no COCs were identified in soil, sediment, fish, or blue crab at Laguna La Chiva based on the exposure scenarios evaluated in the HHRA.

Ecological Risk Assessment

A screening ecological risk assessment (SERA), constituting Steps 1 and 2 of the ERA process, and the first step (Step 3A) of a baseline ecological risk assessment (BERA) was conducted for Laguna La Chiva using sediment and soil data collected during the SI.

For terrestrial habitats surrounding Laguna La Chiva, lines of evidence evaluated included: (1) comparison of surface soil concentrations with ecological screening values (ESVs); (2) evaluation of modeled dietary doses to wildlife; and (3) comparison with concentrations of pesticides detected in soil elsewhere on Vieques and attributed to normal pesticide use. DDD and DDT were not detected in any soil sample. DDE, detected in only one sample, had a concentration which exceeded the ESV. Seven terrestrial wildlife receptors were evaluated for food web exposure to DDE; however, potential risk was conservatively identified only for the velvet free-tailed bat consuming aerial insects with resulting HQs of 2.3 based upon the maximum acceptable toxicant concentration (MATC), and slightly above one (1.04) based upon the lowest observed adverse effect level (LOAEL). Concentrations of pesticides detected in soil elsewhere on Vieques and attributed to normal pesticide use were considered in the risk evaluation. The maximum concentration of DDE detected in Vieques soils and attributed to normal pesticide use is 3,990 µg/kg, a value based on the record of decision (ROD) for Area of Concern (AOC) H, which presented a no action determination indicating there is no unacceptable risk over that of background to human health or the environment under current or potential future site use. At AOC H, DDE was detected in 22 of 32 surface soil samples ranging from 1.4 to 3,990 µg/kg. This maximum DDE concentration is greater than the maximum soil concentration of DDE (2,300 µg/kg) at Laguna La Chiva. Thus, considering that the maximum (and only) detected concentration of DDE in soil around Laguna La Chiva is within the range of concentrations detected in soil on Vieques and attributed to normal pesticide use, DDE was not identified as a COC.

For the lagoon (aquatic) habitat, lines of evidence included: (1) comparison of sediment concentrations with ESVs and equilibrium partitioning values (EqPs); and (2) evaluation of modeled dietary doses to aquatic wildlife. Though DDD, DDE, and DDT were detected above ESVs, concentrations were below EqPs and therefore they were not retained as COPCs in sediment. Carbon disulfide was the only sediment chemical that exceeded the EqP, but was not identified as a final COC considering that is unlikely present as a result of past releases, taking into account factors such as high volatility, low partitioning to sediment, and a half-life in sediment of 7.4 months. Carbon disulfide is also known to be produced naturally by sediment

microorganisms in wetlands. For the evaluation of modeled dietary doses to aquatic wildlife, the food web evaluation did not identify any sediment COCs.

In conclusion, no COCs were identified for direct surface soil or sediment exposures at Laguna La Chiva. Similarly, no COCs were identified for food web exposures to these media. Thus, risks to ecological receptors are acceptable.

Spatial Evaluation of Pesticide Concentrations

Among the station locations (SD01, SD02, SD03, and SD12) placed to help evaluate the potential transport of contaminants from upgradient SWMU 1 via the western ephemeral stream, DDD, DDE, and DDT were detected in all surface (0-6 inches) sediment samples at maximum concentrations of 76 J µg/kg (SD03), 17 J µg/kg (SD02 and SD03), and 54 J µg/kg (SD03), respectively. Additionally, DDD, DDE, and DDT were detected in subsurface (6-12 inches) sediment at SD01 (140 J, 41 J, and 210 J µg/kg, respectively), and DDE was detected in subsurface sediment at SD02 (14 J µg/kg). DDD, DDE, and DDT concentrations are generally greater in the subsurface sediment than in the surface sediment, which suggests there is no ongoing or recent release from the ephemeral stream, but that there may have been historic releases via the ephemeral stream. However, it is also just as likely that the higher concentrations at depth are due to the fact that pesticide applications in support of military training activities ceased decades ago.

Samples from stations SD09, SD10, and SD11, collected to evaluate the potential transport of contaminants from upgradient SWMU 1 or surrounding areas via the eastern ephemeral stream, were non-detect for DDD, DDE, and DDT other than a very low-level DDE detection (1.5 J µg/kg). The non-detect (DDD and DDT) and low detect (DDE) results for the eastern half of the lagoon suggest that an upgradient CERCLA-related release potentially resulting in the transport of contaminants to the lagoon via the eastern ephemeral stream is unlikely because if there was an upgradient CERCLA-related pesticide release, expected concentrations of pesticides at samples from stations SD09, SD10, and SD11 would be higher.

Stations SD02, SD03, and SD12 were also sampled to evaluate potential releases from remnant drums observed at those locations. DDD, DDE, and DDT were detected in surface sediment at all three locations and DDE was detected in subsurface sediment at SD02. The highest concentrations of DDD and DDT were found at SD03 (76 J µg/kg and 54 J µg/kg, respectively); the highest DDE concentration occurred at SD02 and SD03 at 17 J µg/kg for both. Additionally, DDE was detected in subsurface sediment at SD02 (14 J µg/kg). The concentrations of DDD, DDE, and DDT at these three drum locations, including surface and subsurface data, are within the range of concentrations at all other sediment stations at the southwestern end of the lagoon (i.e., stations SD01, SD04, SD05, SD06, and SD07). DDD ranged from 3.6 UJ to 76 J µg/kg at the drum stations, and from 6.3 UJ to 150 J µg/kg at the southwestern lagoon stations. DDE ranged from 14 J to 17 J µg/kg at the drum stations, and from 2.6 UJ to 41 J µg/kg at the southwestern lagoon stations. DDT ranged from 3.6 UJ to 54 J µg/kg at the drum stations, and from 2.6 UJ to 210 J µg/kg at the southwestern lagoon stations. These comparable data sets indicate that the drums are not the likely source of pesticides detected in Laguna La Chiva sediment.

Samples collected at stations SD04, SD05, SD07, and SD08 were used to help confirm the historical (2007) pesticide concentrations reported at NOAA sampling stations 46P, 47P, and 115S3A. The 2013 SI results show that the elevated DDD, DDE, and DDT concentrations previously measured at NOAA station 46P were not found in the SI sampling at this station (SD04) or in the nearby (approximately 30 ft) deeper channel station (SD05). DDD was detected in surface sediment at SD04 at a concentration of 8.3 J µg/kg and at SD05 at a concentration of 7.2 J µg/kg (versus 195 µg/kg at NOAA station 46P). DDE was detected at a concentration of 20 J µg/kg at SD04 (versus 123 µg/kg at NOAA station 46P) and was not detected at nearby station SD05. DDT was not detected at either SD04 or SD05; DDT was previously detected at a concentration of 654 µg/kg at station 46P. SI sampling at NOAA stations 47P and 115S3A (SI stations SD08 and SD07, respectively) resulted in all concentrations below detection with the exception of a single detect of DDD (2.6 J µg/kg) at SD07.

Samples from stations SD06 and SD07 were collected to evaluate sediment near the public fishing pier on the vehicle bridge across the southern arm of the lagoon. DDD was detected at a concentration of 150 J µg/kg upgradient of the fishing pier (SD06) and at a concentration of 2.6J µg/kg downgradient (SD07). DDE was detected at SD06 at a concentration of 14 J µg/kg but was non-detect at SD07. DDT was not detected at either station. As discussed previously, none of the pesticide concentrations in lagoon sediment poses an unacceptable risk to potential human receptors, including those catching fish from the lagoon.

Step 7: Does the historic information and/or spatial distribution of data indicate the potential source area was sufficiently sampled?

Evaluation of historical information, observations made during inter-agency site visits, and inter-agency discussions determined that the transport of contaminants from upgradient SWMU 1 or surrounding areas to the lagoon via the eastern and/or western ephemeral streams and drum remnants represented the potential sources of potential CERCLA-related releases warranting investigations. Surface soil and sediment samples were collected in these areas during the SI. In addition, surface soil and sediment samples were collected at locations previously sampled by NOAA in 2007 that exhibited elevated DDD, DDE, and DDT concentrations. Sediment samples were also collected near the public fishing pier on the vehicle bridge across the southern arm of the lagoon and surface soil samples were collected from the uplands surrounding the lagoon. Additionally, samples were collected across the entire reach of the lagoon and at multiple depths to help assess spatial variability, potential sources (including normal pesticide application), and risks. Based on this information, the spatial distribution of the samples collected at Laguna La Chiva and the resulting data indicate that the potential source areas were sufficiently sampled and the data are representative of the lagoon surface water and sediment as a whole. Further, the information collected during historical sampling by NOAA, observations made during the SI (i.e., absence of source area), and analytical results of SI sampling throughout and adjacent to Laguna La Chiva indicate the data are also representative of the dredged soil/sediment.

2.5 Conclusions and No Action Determination

The decision analysis process described above indicates that, based on the SI data, the existing sediment and soil constituent concentrations do not pose a potentially unacceptable risk to human or ecological receptors. In addition, the concentrations and spatial distribution of pesticides support the assumption that the likely source of pesticides was normal pesticide application. Therefore, no action is warranted for Laguna La Chiva or the dredged soil/sediment associated with the bridge refurbishment. However, should the dredged soil/sediment be identified for re-use, it will be characterized in accordance with the planned re-use.

TABLE 2-1
Laguna La Chiva Sediment Detection and Exceedance Results
Laguna La Chiva No Action Decision Document
Former Vieques Naval Training Range
Vieques, Puerto Rico

Sample ID	**RSL Residential Soil Adjusted[1]**	**ESV Sediment**	Veno-SD01-000H	Veno-SD01-0H01	Veno-SD01P-000H	Veno-SD02-000H	Veno-SD02-0H01	Veno-SD03-000H	VENO-SD04-000H	VENO-SD04-0H01	VENO-SD05-000H	VENO-SD06-000H
Sample Type			Native	Native	Field Duplicate	Native	Native	Native	Native	Native	Native	Native
Sample Depth (ft)			0 - 0.5	0.5 - 1.0	0 - 0.5	0 - 0.5	0.5 - 1.0	0 - 0.5	0 - 0.5	0.5 - 1.0	0 - 0.5	0 - 0.5
Sample Date			5/15/2013 10:30	5/15/2013 10:45	5/15/2013 10:30	5/15/2013 9:15	5/15/2013 10:00	5/15/2013 8:15	5/17/2013 8:35	5/17/2013 8:20	5/17/2013 9:10	5/17/2013 9:35
Chemical Name												
Volatile Organic Compounds (UG/KG)												
2-Butanone	2,800,000	--	4.6 UJ	**5.3 J**	**4.9 J**	**48 J**	**27 J**	**23 J**	**23 J**	**13 J**	**25 J**	**56 J**
Acetone	6,100,000	--	**12.0 J**	**26 J**	**22 J**	**140 J**	**100 J**	**90 J**	**120 J**	**71 J**	**130 J**	**240 J**
Bromoform	62,000	--	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ
Carbon disulfide	82,000	--	9.1 U	8.2 U	9 U	13 UJ	9.1 UJ	**8.4 J**	**51 J**	**85 J**	**16 J**	**20 J**
Semivolatile Organic Compounds (UG/KG)												
No Detections												
Pesticides (UG/KG)												
4,4'-DDD	2,000	1.22	**8.4 J**	**140 J**	**15 J**	**7.1 J**	3.6 UJ	**76 J**	**8.3 J**	6.3 UJ	**7.2 J**	**150 J**
4,4'-DDE	1,400	2.2	**11 J**	**41 J**	**16 J**	**17 J**	**14 J**	**17 J**	**20 J**	6.3 UJ	7.2 UJ	**14 J**
4,4'-DDT	1,700	1.19	**3.2 J**	**210 J**	**8.8 J**	**3.7 J**	3.6 UJ	**54 J**	8.4 UJ	6.3 UJ	7.2 UJ	5.4 UJ

Notes:
1 - Adjusted Regional Screening Levels (RSLs)(USEPA, Nov 2013)
ESV - Ecological screening value
J - Estimated result
NS - Not sampled
U - Not detected
UJ - Not detected, quantitation limit may be inaccurate
MG/KG - Milligrams per kilogram
Bold text indicates detection
Blue shading indicates exceedance of ESV

TABLE 2-1
Laguna La Chiva Sediment Detection and Exceedance Results
Laguna La Chiva No Action Decision Document
Former Vieques Naval Training Range
Vieques, Puerto Rico

Sample ID	**RSL Residential Soil Adjusted[1]**	**ESV Sediment**	VENO-SD07-000H	VENO-SD07P-000H	Veno-SD08-000H	Veno-SD09-000H	Veno-SD10-000H	Veno-SD11-000H	Veno-SD11-0H01	Veno-SD12-000H
Sample Type			Native	Field Duplicate	Native	Native	Native	Native	Native	Native
Sample Depth (ft)			0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0.5 - 1.0	0 - 0.5
Sample Date			5/17/2013 10:15	5/17/2013 10:15	5/16/2013 10:15	5/16/2013 10:45	5/16/2013 9:50	5/16/2013 8:50	5/16/2013 9:00	5/15/2013 8:30
Chemical Name										
Volatile Organic Compounds (UG/KG)										
2-Butanone	2,800,000	--	2.8 U	3.3 U	**17 J**	**7.8 J**	**24 0**	**23 J**	**8.3 0**	**16 J**
Acetone	6,100,000	--	**7.8 J**	**8.1 J**	**95 J**	**43 J**	**120 0**	**100 J**	**37 0**	**73 J**
Bromoform	62,000	--	1.1 U	1.3 U	3.6 UJ	2.3 UJ	**0.70 J**	2.7 UJ	1.2 U	2.6 UJ
Carbon disulfide	82,000	--	**4.8 J**	**4.1 J**	**34 J**	**25 J**	9.6 U	**13 J**	**21 0**	**21 J**
Semivolatile Organic Compounds (UG/KG)										
No Detections										
Pesticides (UG/KG)										
4,4'-DDD	2,000	1.22	**2.6 J**	**2.5 J**	5.8 UJ	4.7 UJ	3.8 UJ	4.7 UJ	2.1 UJ	**4 J**
4,4'-DDE	1,400	2.2	2.6 UJ	2.6 UJ	5.8 UJ	4.7 UJ	3.8 UJ	4.7 UJ	**1.5 J**	**14 J**
4,4'-DDT	1,700	1.19	2.6 UJ	2.6 UJ	5.8 UJ	4.7 UJ	3.8 UJ	4.7 UJ	2.1 UJ	**4 J**

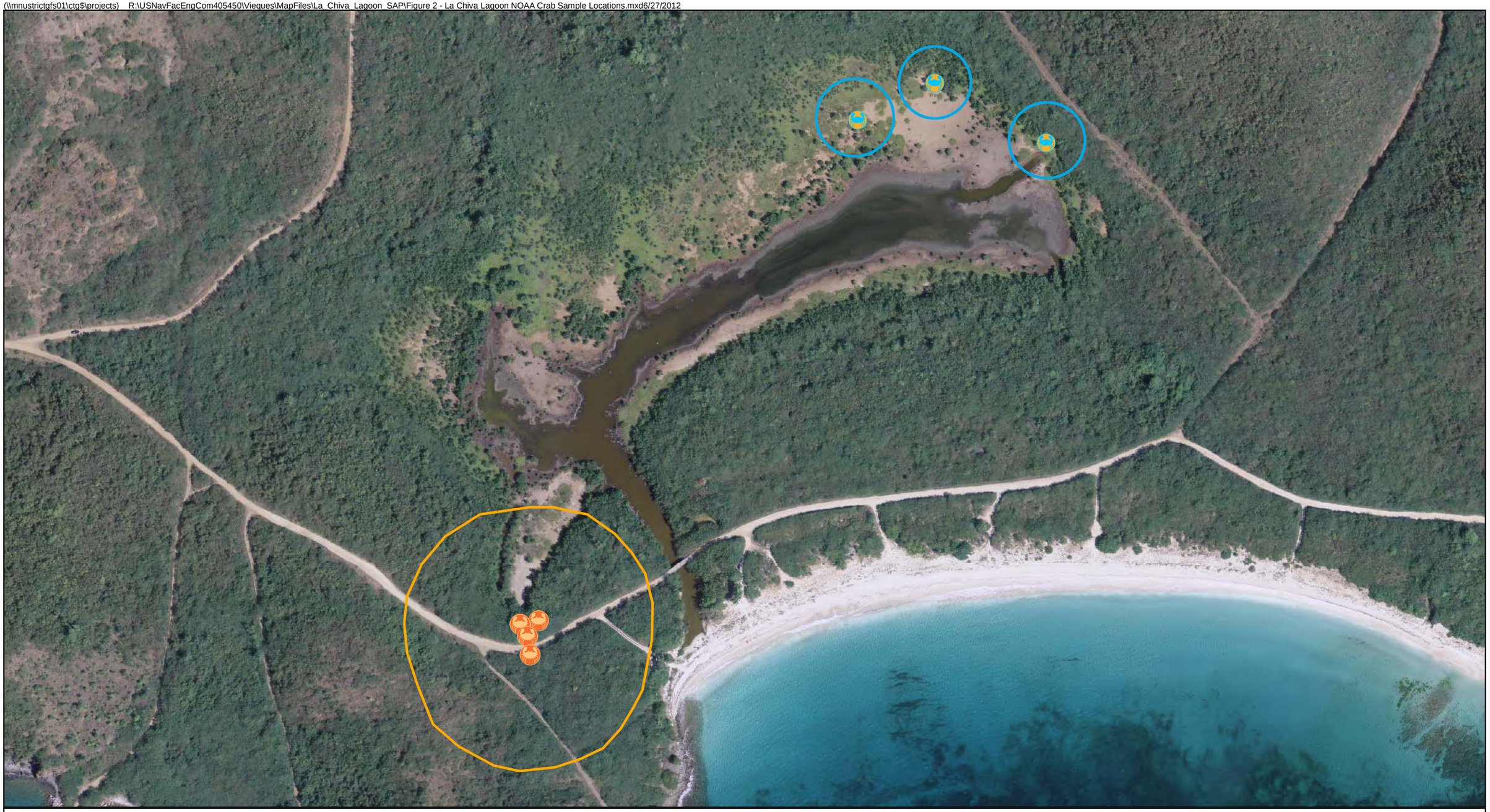
Notes:
1 - Adjusted Regional Screening Levels (RSLs)(USEPA, Nov 2013)
ESV - Ecological screening value
J - Estimated result
NS - Not sampled
U - Not detected
UJ - Not detected, quantitation limit may be inaccurate
MG/KG - Milligrams per kilogram
Bold text indicates detection
Blue shading indicates exceedance of ESV

TABLE 2-2
Laguna La Chiva Soil Detection and Exceedance Results
Laguna La Chiva No Action Decision Document
Former Vieques Naval Training Range
Vieques, Puerto Rico

Sample ID	**RSL Residential Soil Adjusted[1]**	**ESV Soil**	Veno-SS01-0002	Veno-SS01P-0002	VENO-SS02-0001	VENO-SS03-0001	Veno-SS04-0001	Veno-SS05-0002	VENO-SS06-0001	Veno-SS07-0002
Sample Type			Native	Field Duplicate	Native	Native	Native	Native	Native	Native
Sample Depth (ft)			0 - 2.0	0 - 2.0	0 - 1.0	0 - 1.0	0 - 1.0	0 - 2.0	0 - 1.0	0 - 2.0
Sample Date			5/14/2013 9:30	5/14/2013 9:30	5/16/2013 14:35	5/16/2013 14:20	5/14/2013 11:00	5/14/2013 10:30	5/16/2013 15:10	5/14/2013 13:30
Chemical Name										
Pesticides (UG/KG)										
4,4'-DDE	1,400	114	1.3 U	1.3 UJ	1.4 UJ	1.4 U	1.5 UJ	**2,300**	2 UJ	2.1 U

Notes:
1 - Adjusted Regional Screening Levels (RSLs)(USEPA, Nov 2013)
ESV - Ecological screening value
NS - Not sampled
U - Not detected
UJ - Not detected, quantitation limit may be inaccurate
MG/KG - Milligrams per kilogram
Bold text indicates detection
Green shading indicates exceedance of Adjusted RSL for Residential Soil and ESV
Blue shading indicates exceedance of ESV

(\\mnustrictgfs01\ctg$\projects) R:\USNavFacEngCom405450\Vieques\MapFiles\La_Chiva_Lagoon_SAP\Figure 2 - La Chiva Lagoon NOAA Crab Sample Locations.mxd6/27/2012

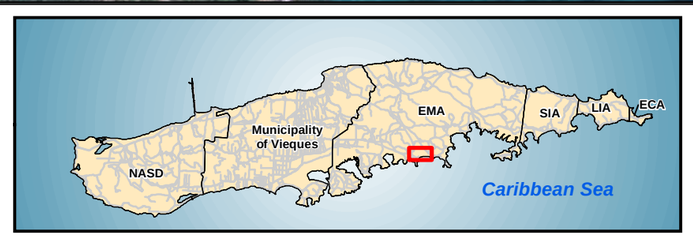


Land Crab Location

Fiddler Crab Location

Sampled Land Crab Habitat Range (100m from burrow)

Sampled Fiddler Crab Habitat Range (30m from burrow)



N
W E
S

0 250
Feet

FIGURE 2-1
Laguna La Chiva NOAA Crab Sample Locations
No Action Decision Document Laguna La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

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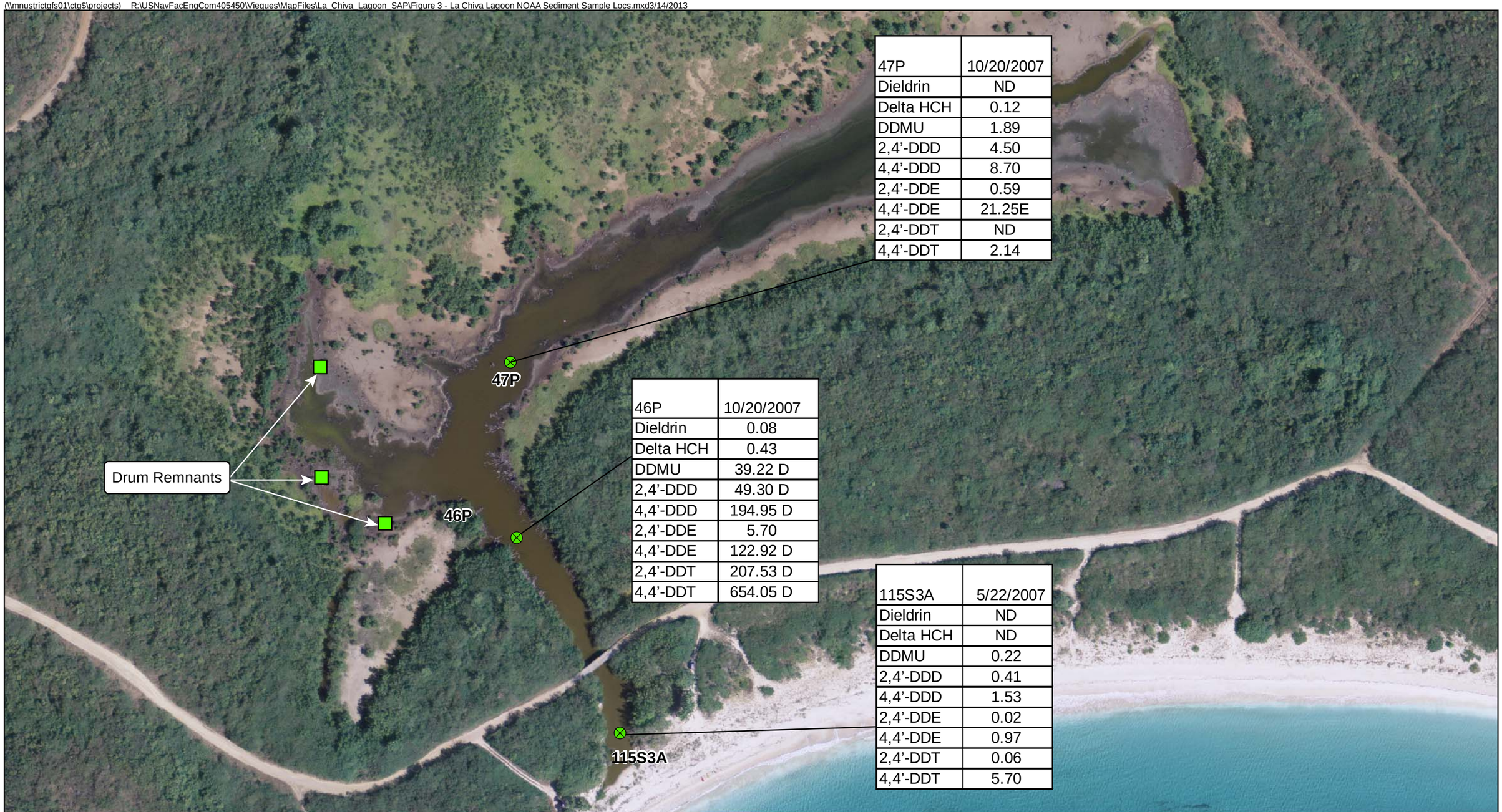
* An Ecological Characterization of The Marine Resources of Vieques, Puerto Rico.
Part II: Field Studies of Habitats, Nutrients, Contaminants, Fish and Benthic Communities.
NOAA Technical Memorandum NOS NCCOS 110

ES121113032416TPA F2-1 Laguna La Chiva NOAA Crab Sample Locations.ai



47P	10/20/2007
Dieldrin	ND
Delta HCH	0.12
DDMU	1.89
2,4'-DDD	4.50
4,4'-DDD	8.70
2,4'-DDE	0.59
4,4'-DDE	21.25E
2,4'-DDT	ND
4,4'-DDT	2.14

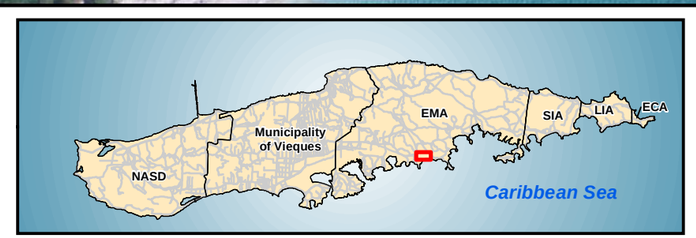
46P	10/20/2007
Dieldrin	0.08
Delta HCH	0.43
DDMU	39.22 D
2,4'-DDD	49.30 D
4,4'-DDD	194.95 D
2,4'-DDE	5.70
4,4'-DDE	122.92 D
2,4'-DDT	207.53 D
4,4'-DDT	654.05 D

115S3A	5/22/2007
Dieldrin	ND
Delta HCH	ND
DDMU	0.22
2,4'-DDD	0.41
4,4'-DDD	1.53
2,4'-DDE	0.02
4,4'-DDE	0.97
2,4'-DDT	0.06
4,4'-DDT	5.70

Legend

NOAA Sediment Samples

ND = Not Detected
All concentrations listed in µg/kg



N
W E
S

0 175 350
Feet

FIGURE 2-2
Laguna La Chiva NOAA Sediment Sample Locations
No Action Decision Document Laguna La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

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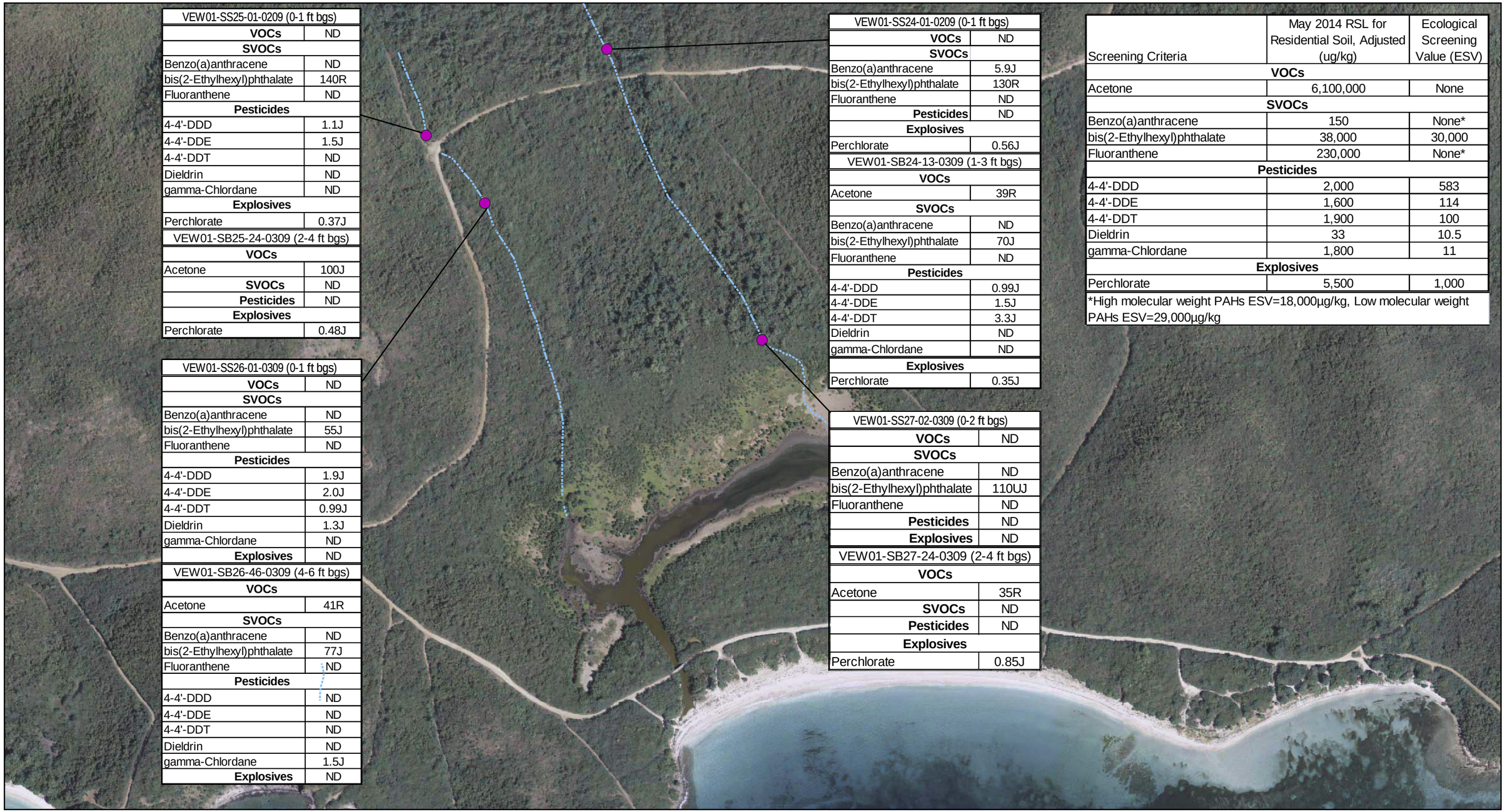

VEW01-SS25-01-0209 (0-1 ft bgs)	
VOCs	ND
SVOCs	
Benzo(a)anthracene	ND
bis(2-Ethylhexyl)phthalate	140R
Fluoranthene	ND
Pesticides	
4-4'-DDD	1.1J
4-4'-DDE	1.5J
4-4'-DDT	ND
Dieldrin	ND
gamma-Chlordane	ND
Explosives	
Perchlorate	0.37J

VEW01-SB25-24-0309 (2-4 ft bgs)	
VOCs	
Acetone	100J
SVOCs	ND
Pesticides	ND
Explosives	
Perchlorate	0.48J

VEW01-SS26-01-0309 (0-1 ft bgs)	
VOCs	ND
SVOCs	
Benzo(a)anthracene	ND
bis(2-Ethylhexyl)phthalate	55J
Fluoranthene	ND
Pesticides	
4-4'-DDD	1.9J
4-4'-DDE	2.0J
4-4'-DDT	0.99J
Dieldrin	1.3J
gamma-Chlordane	ND
Explosives	ND

VEW01-SB26-46-0309 (4-6 ft bgs)	
VOCs	
Acetone	41R
SVOCs	
Benzo(a)anthracene	ND
bis(2-Ethylhexyl)phthalate	77J
Fluoranthene	ND
Pesticides	
4-4'-DDD	ND
4-4'-DDE	ND
4-4'-DDT	ND
Dieldrin	ND
gamma-Chlordane	1.5J
Explosives	ND

VEW01-SS24-01-0209 (0-1 ft bgs)	
VOCs	ND
SVOCs	
Benzo(a)anthracene	5.9J
bis(2-Ethylhexyl)phthalate	130R
Fluoranthene	ND
Pesticides	ND
Explosives	
Perchlorate	0.56J

VEW01-SB24-13-0309 (1-3 ft bgs)	
VOCs	
Acetone	39R
SVOCs	
Benzo(a)anthracene	ND
bis(2-Ethylhexyl)phthalate	70J
Fluoranthene	ND
Pesticides	
4-4'-DDD	0.99J
4-4'-DDE	1.5J
4-4'-DDT	3.3J
Dieldrin	ND
gamma-Chlordane	ND
Explosives	
Perchlorate	0.35J

VEW01-SS27-02-0309 (0-2 ft bgs)	
VOCs	ND
SVOCs	
Benzo(a)anthracene	ND
bis(2-Ethylhexyl)phthalate	110UJ
Fluoranthene	ND
Pesticides	ND
Explosives	ND

VEW01-SB27-24-0309 (2-4 ft bgs)	
VOCs	
Acetone	35R
SVOCs	ND
Pesticides	ND
Explosives	
Perchlorate	0.85J

Screening Criteria	May 2014 RSL for Residential Soil, Adjusted (ug/kg)	Ecological Screening Value (ESV)
VOCs		
Acetone	6,100,000	None
SVOCs		
Benzo(a)anthracene	150	None*
bis(2-Ethylhexyl)phthalate	38,000	30,000
Fluoranthene	230,000	None*
Pesticides		
4-4'-DDD	2,000	583
4-4'-DDE	1,600	114
4-4'-DDT	1,900	100
Dieldrin	33	10.5
gamma-Chlordane	1,800	11
Explosives		
Perchlorate	5,500	1,000

*High molecular weight PAHs ESV=18,000µg/kg, Low molecular weight PAHs ESV=29,000µg/kg

Legend

Ephemeral Stream

2009 Ephemeral Stream Sample Locations

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

NJ - Presumptively present at approximate quantity

R - Rejected result

UJ - Not detected, quantitation limit may be inaccurate

ND - Not detected

All concentrations listed in µg/kg

0 250 500 Feet

N W E S

FIGURE 2-3
SWMU 1 Ephemeral Stream Soil Samples
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Atlantic Fleet Weapons Training Area - Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

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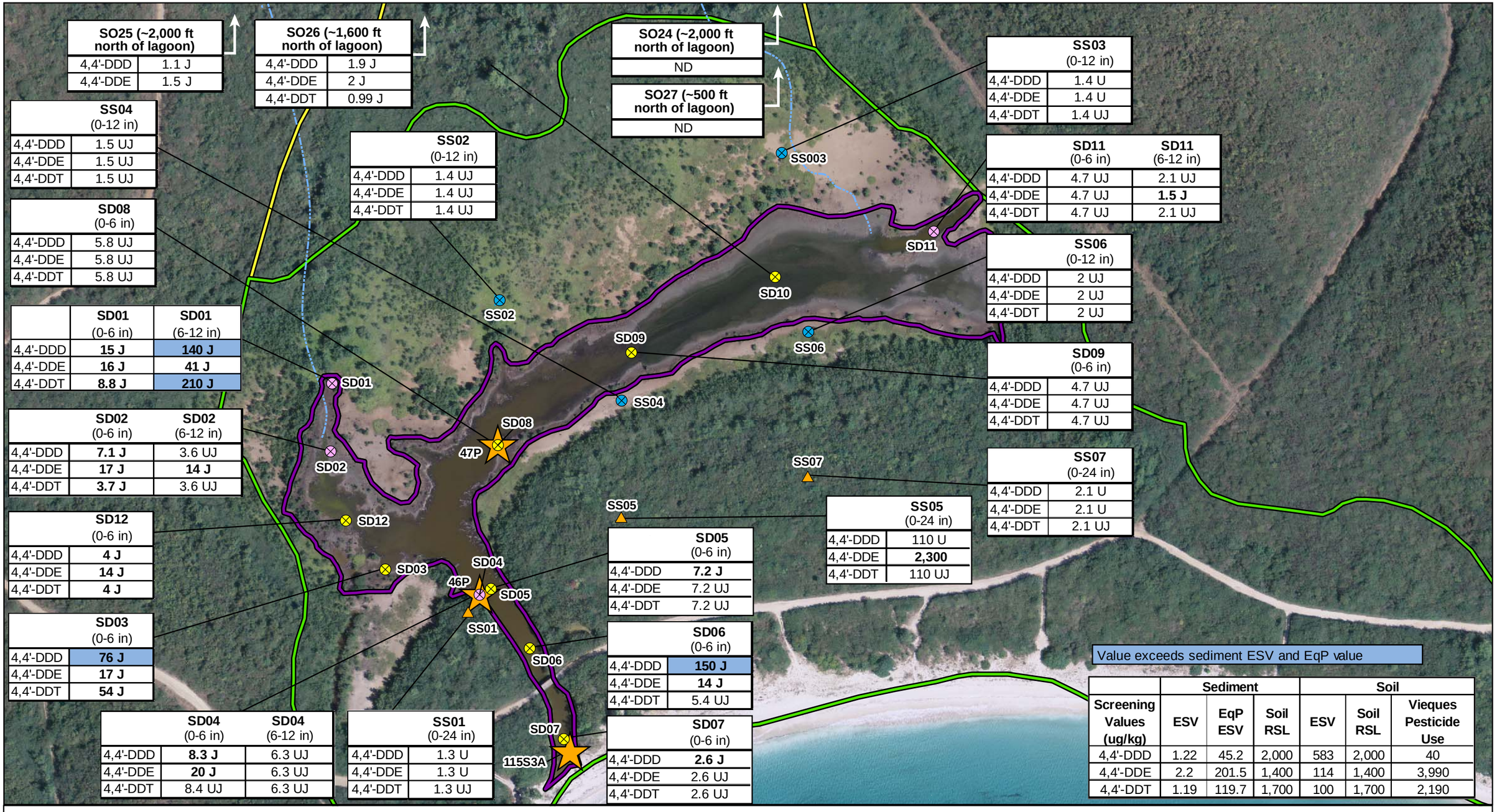

Screening Values (ug/kg)	Sediment ESV	Sediment EqP ESV	Sediment Soil RSL	Soil ESV	Soil Soil RSL	Soil Vieques Pesticide Use
4,4'-DDD	1.22	45.2	2,000	583	2,000	40
4,4'-DDE	2.2	201.5	1,400	114	1,400	3,990
4,4'-DDT	1.19	119.7	1,700	100	1,700	2,190

FIGURE 2-4
Laguna La Chiva Soil and Sediment Sample Pesticide Results
No Action Decision Document Laguna La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

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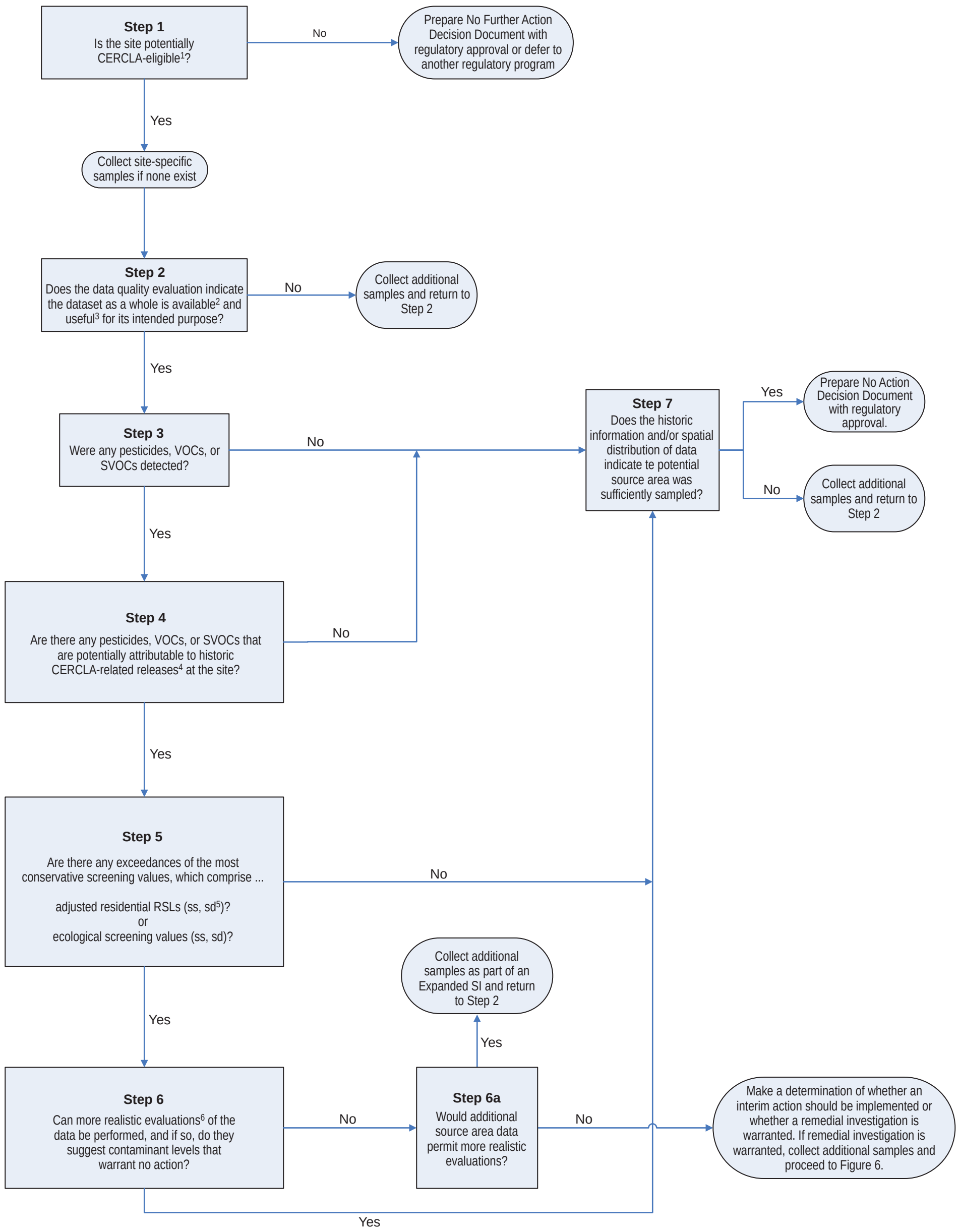

Notes:
The decision makers associated with this decision tree are the Navy, USEPA, PREQB, and USFWS.

This decision tree, and the worksheets referenced below, originated from the *Sampling and Analysis Plan Laguna La Chiva Site Inspection/Remedial Investigation, Atlantic Fleet Weapons Training Area - Vieques, Former Vieques Naval Training Range, Vieques, Puerto Rico, April 2013.*

[1] Determination of CERCLA eligibility is described in Worksheet #11

[2] "Available" data are described in Worksheet #37

[3] "Useful" data are described in Worksheet #37

[4] CERCLA-related releases are defined in Worksheet #11

[5] ss = surface soil; sd = sediment

[6] Examples of the types of more realistic evaluations that may be performed are described in Section 1.1.2 of the Final SI/ESI Report (CH2M HILL, October 2009)

FIGURE 2-5
Site Inspection Evaluation Decision Tree
No Action Decision Document Laguna La Chiva
Atlantic Fleet Weapons Training Area - Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

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SECTION 3

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Appendix A
Analytical Data

Vieques East
Laguna La Chiva
Validated Sediment Raw Analytical Data
May 2013

Sample ID	Veno-SD01-000H	Veno-SD01-0H01	Veno-SD01P-000H	Veno-SD02-000H	Veno-SD02-0H01	Veno-SD03-000H	VENO-SD04-000H	VENO-SD04-0H01	VENO-SD05-000H	VENO-SD06-000H	VENO-SD07-000H	VENO-SD07P-000H	Veno-SD08-000H	Veno-SD09-000H	Veno-SD10-000H	Veno-SD11-000H	Veno-SD11-0H01	Veno-SD12-000H
Sample Date	5/15/2013 10:30	5/15/2013 10:45	5/15/2013 10:30	5/15/2013 9:15	5/15/2013 10:00	5/15/2013 8:15	5/17/2013 8:35	5/17/2013 8:20	5/17/2013 9:10	5/17/2013 9:35	5/17/2013 10:15	5/17/2013 10:15	5/16/2013 10:15	5/16/2013 10:45	5/16/2013 9:50	5/16/2013 8:50	5/16/2013 9:00	5/15/2013 8:30
Chemical Name																		
Volatile Organic Compounds (UG/KG)																		
1,1,1-Trichloroethane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,1,2,2-Tetrachloroethane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,1,2-Trichloroethane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,1-Dichloroethane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,1-Dichloroethene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,2,3-Trichlorobenzene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,2,4-Trichlorobenzene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,2-Dibromo-3-chloropropane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,2-Dibromoethane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,2-Dichlorobenzene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,2-Dichloroethane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,2-Dichloropropane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,3-Dichlorobenzene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
1,4-Dichlorobenzene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
2-Butanone	4.6 UJ	5.3 J	4.9 J	48 J	27 J	23 J	23 J	13 J	25 J	56 J	2.8 U	3.3 U	17 J	7.8 J	24	23 J	8.3	16 J
2-Hexanone	4.6 U	4.1 U	4.5 U	6.3 UJ	4.6 UJ	5.4 UJ	14 UJ	9.5 UJ	13 UJ	9.8 UJ	2.8 U	3.3 U	9 UJ	5.8 UJ	4.8 U	6.6 UJ	2.9 U	6.4 UJ
4-Methyl-2-pentanone	4.6 U	4.1 U	4.5 U	6.3 UJ	4.6 UJ	5.4 UJ	14 UJ	9.5 UJ	13 UJ	9.8 UJ	2.8 U	3.3 U	9 UJ	5.8 UJ	4.8 U	6.6 UJ	2.9 U	6.4 UJ
Acetone	12 J	26 J	22 J	140 J	100 J	90 J	120 J	71 J	130 J	240 J	7.8 J	8.1 J	95 J	43 J	120	100 J	37	73 J
Benzene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Bromochloromethane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Bromodichloromethane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Bromoform	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	0.7 J	2.7 UJ	1.2 U	2.6 UJ
Bromomethane	9.1 U	8.2 U	9 U	13 UJ	9.1 UJ	11 UJ	29 UJ	19 UJ	25 UJ	20 UJ	5.5 U	6.6 U	18 UJ	12 UJ	9.6 U	13 UJ	5.9 U	13 UJ
Carbon disulfide	9.1 U	8.2 U	9 U	13 UJ	9.1 UJ	8.4 J	51 J	85 J	16 J	20 J	4.8 J	4.1 J	34 J	25 J	9.6 U	13 J	21	21 J
Carbon tetrachloride	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Chlorobenzene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Chloroethane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Chloroform	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Chloromethane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
cis-1,2-Dichloroethene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
cis-1,3-Dichloropropene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Cyclohexane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Dibromochloromethane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Dichlorodifluoromethane (Freon-12)	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Ethylbenzene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Isopropylbenzene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
m- and p-Xylene	3.6 U	3.3 U	3.6 U	5.1 UJ	3.6 UJ	4.3 UJ	12 UJ	7.6 UJ	10 UJ	7.8 UJ	2.2 U	2.6 U	7.2 UJ	4.7 UJ	3.8 U	5.3 UJ	2.3 U	5.1 UJ
Methyl acetate	9.1 U	8.2 U	9 U	13 UJ	9.1 UJ	11 UJ	29 UJ	19 UJ	25 UJ	20 UJ	5.5 U	6.6 U	18 UJ	12 UJ	9.6 U	13 UJ	5.9 U	13 UJ
Methylcyclohexane	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Methylene chloride	9.1 U	8.2 U	9 U	13 UJ	9.1 UJ	11 UJ	29 UJ	19 UJ	25 UJ	20 UJ	5.5 U	6.6 U	18 UJ	12 UJ	9.6 U	13 UJ	5.9 U	13 UJ
Methyl-tert-butyl ether (MTBE)	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
o-Xylene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Styrene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Tetrachloroethene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Toluene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
trans-1,2-Dichloroethene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
trans-1,3-Dichloropropene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Trichloroethene	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Trichlorofluoromethane (Freon-11)	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ
Vinyl chloride	1.8 U	1.6 U	1.8 U	2.5 UJ	1.8 UJ	2.2 UJ	5.8 UJ	3.8 UJ	5 UJ	3.9 UJ	1.1 U	1.3 U	3.6 UJ	2.3 UJ	1.9 U	2.7 UJ	1.2 U	2.6 UJ

Vieques East
Laguna La Chiva
Validated Sediment Raw Analytical Data
May 2013

Sample ID	Veno-SD01-000H	Veno-SD01-0H01	Veno-SD01P-000H	Veno-SD02-000H	Veno-SD02-0H01	Veno-SD03-000H	VENO-SD04-000H	VENO-SD04-0H01	VENO-SD05-000H	VENO-SD06-000H	VENO-SD07-000H	VENO-SD07P-000H	Veno-SD08-000H	Veno-SD09-000H	Veno-SD10-000H	Veno-SD11-000H	Veno-SD11-0H01	Veno-SD12-000H
Sample Date	5/15/2013 10:30	5/15/2013 10:45	5/15/2013 10:30	5/15/2013 9:15	5/15/2013 10:00	5/15/2013 8:15	5/17/2013 8:35	5/17/2013 8:20	5/17/2013 9:10	5/17/2013 9:35	5/17/2013 10:15	5/17/2013 10:15	5/16/2013 10:15	5/16/2013 10:45	5/16/2013 9:50	5/16/2013 8:50	5/16/2013 9:00	5/15/2013 8:30
Chemical Name																		
Semivolatile Organic Compounds (UG/KG)																		
1,1-Biphenyl	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
1,2,4,5-Tetrachlorobenzene	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
2,2'-Oxybis(1-chloropropane)	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
2,3,4,6-Tetrachlorophenol	360 U	330 UJ	360 U	430 UJ	360 UJ	430 UJ	840 UJ	630 R	720 R	540 R	260 U	260 U	580 UJ	470 UJ	380 U	470 UJ	210 U	510 UJ
2,4,5-Trichlorophenol	180 U	160 UJ	180 U	210 UJ	180 UJ	220 UJ	420 UJ	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
2,4,6-Trichlorophenol	180 U	160 UJ	180 U	210 UJ	180 UJ	220 UJ	420 UJ	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
2,4-Dichlorophenol	180 U	160 UJ	180 U	210 UJ	180 UJ	220 UJ	420 UJ	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
2,4-Dimethylphenol	180 U	160 UJ	180 U	210 UJ	180 UJ	220 UJ	420 UJ	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
2,4-Dinitrophenol	550 UJ	490 UJ	540 UJ	640 UJ	550 UJ	650 UJ	1300 UJ	950 R	1100 R	810 R	400 UJ	390 UJ	870 UJ	700 UJ	570 UJ	710 UJ	320 UJ	770 UJ
2,4-Dinitrotoluene	180 UJ	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 UJ	130 UJ	290 UJ	230 UJ	190 UJ	240 UJ	110 UJ	260 UJ
2,6-Dinitrotoluene	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
2-Chlorophenol	180 U	160 UJ	180 U	210 UJ	180 UJ	220 UJ	420 UJ	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
2-Methylphenol	180 U	160 UJ	180 U	210 UJ	180 UJ	220 UJ	420 UJ	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
2-Nitroaniline	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
2-Nitrophenol	180 U	160 UJ	180 U	210 UJ	180 UJ	220 UJ	420 UJ	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
3- and 4-Methylphenol	360 U	330 UJ	360 U	430 UJ	360 UJ	430 UJ	840 UJ	630 R	720 R	540 R	260 U	260 U	580 UJ	470 UJ	380 U	470 UJ	210 U	510 UJ
3,3'-Dichlorobenzidine	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
3-Nitroaniline	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
4,6-Dinitro-2-methylphenol	550 UJ	490 UJ	540 UJ	640 UJ	550 UJ	650 UJ	1300 UJ	950 R	1100 R	810 R	400 UJ	390 UJ	870 UJ	700 UJ	570 UJ	710 UJ	320 UJ	770 UJ
4-Bromophenyl-phenylether	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
4-Chloro-3-methylphenol	180 U	160 UJ	180 U	210 UJ	180 UJ	220 UJ	420 UJ	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
4-Chloroaniline	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
4-Chlorophenyl-phenylether	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
4-Nitroaniline	180 UJ	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 UJ	130 UJ	290 UJ	230 UJ	190 UJ	240 UJ	110 UJ	260 UJ
4-Nitrophenol	180 UJ	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 UJ	320 R	360 R	270 R	130 UJ	130 UJ	290 UJ	230 UJ	190 UJ	240 UJ	110 UJ	260 UJ
Acetophenone	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Atrazine	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Benzaldehyde	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
bis(2-Chloroethoxy)methane	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
bis(2-Chloroethyl)ether	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
bis(2-Ethylhexyl)phthalate	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Butylbenzylphthalate	180 UJ	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 UJ	130 UJ	290 UJ	230 UJ	190 UJ	240 UJ	110 UJ	260 UJ
Caprolactam	360 U	330 UJ	360 UJ	430 UJ	360 UJ	430 UJ	840 R	630 R	720 R	540 R	260 U	260 U	580 UJ	470 UJ	380 U	470 UJ	210 U	510 UJ
Carbazole	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Dibenzofuran	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Diethylphthalate	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Dimethyl phthalate	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Di-n-butylphthalate	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Di-n-octylphthalate	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Hexachlorobenzene	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Hexachlorobutadiene	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Hexachlorocyclopentadiene	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Hexachloroethane	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Isophorone	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
Nitrobenzene	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
n-Nitroso-di-n-propylamine	180 U	160 UJ	180 UJ	210 UJ	180 UJ	220 UJ	420 R	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ
n-Nitrosodiphenylamine	360 U	330 UJ	360 UJ	430 UJ	360 UJ	430 UJ	840 R	630 R	720 R	540 R	260 U	260 U	580 UJ	470 UJ	380 U	470 UJ	210 U	510 UJ
Pentachlorophenol	550 U	490 UJ	540 U	640 UJ	550 UJ	650 UJ	1300 UJ	950 R	1100 R	810 R	400 U	390 U	870 UJ	700 UJ	570 U	710 UJ	320 U	770 UJ
Phenol	180 U	160 UJ	180 U	210 UJ	180 UJ	220 UJ	420 UJ	320 R	360 R	270 R	130 U	130 U	290 UJ	230 UJ	190 U	240 UJ	110 U	260 UJ

Vieques East
Laguna La Chiva
Validated Sediment Raw Analytical Data
May 2013

Sample ID	Veno-SD01-000H	Veno-SD01-0H01	Veno-SD01P-000H	Veno-SD02-000H	Veno-SD02-0H01	Veno-SD03-000H	VENO-SD04-000H	VENO-SD04-0H01	VENO-SD05-000H	VENO-SD06-000H	VENO-SD07-000H	VENO-SD07P-000H	Veno-SD08-000H	Veno-SD09-000H	Veno-SD10-000H	Veno-SD11-000H	Veno-SD11-0H01	Veno-SD12-000H
Sample Date	5/15/2013 10:30	5/15/2013 10:45	5/15/2013 10:30	5/15/2013 9:15	5/15/2013 10:00	5/15/2013 8:15	5/17/2013 8:35	5/17/2013 8:20	5/17/2013 9:10	5/17/2013 9:35	5/17/2013 10:15	5/17/2013 10:15	5/16/2013 10:15	5/16/2013 10:45	5/16/2013 9:50	5/16/2013 8:50	5/16/2013 9:00	5/15/2013 8:30
Chemical Name																		
Pesticide/Polychlorinated Biphenyls (UG/KG)																		
4,4'-DDD	8.4 J	140 J	15 J	7.1 J	3.6 UJ	76 J	8.3 J	6.3 UJ	7.2 J	150 J	2.6 J	2.5 J	5.8 UJ	4.7 UJ	3.8 UJ	4.7 UJ	2.1 UJ	4 J
4,4'-DDE	11 J	41 J	16 J	17 J	14 J	17 J	20 J	6.3 UJ	7.2 UJ	14 J	2.6 UJ	2.6 UJ	5.8 UJ	4.7 UJ	3.8 UJ	4.7 UJ	1.5 J	14 J
4,4'-DDT	3.2 J	210 J	8.8 J	3.7 J	3.6 UJ	54 J	8.4 UJ	6.3 UJ	7.2 UJ	5.4 UJ	2.6 UJ	2.6 UJ	5.8 UJ	4.7 UJ	3.8 UJ	4.7 UJ	2.1 UJ	4 J
Wet Chemistry																		
pH (pH units)	7.7	7.5	NS	7.8	7.8	8	7.3	7.5	7.5	7.5	7.7	NS	7.6	8.1	7.8	7.8	8.1	8
Total organic carbon (TOC) (MG/KG)	32000	22000	NS	48000	28000	47000	100000	67000	47000	38000	4500	NS	70000	44000	26000	36000	20000	55000
Grain Size (PCT)																		
Coarse Sand (%)	0.1	0		0.4	0	0.2	2.7	0.4	0	0	0.1		0.8	0	0	0	0	0.1
Fine Sand (%)	0.4	0.4		0.4	0.3	0.6	4	1.3	0.2	0.5	63.3		1.6	0.5	0.5	0.3	0.1	0.7
Fines (%)	99.3	99.3		98.1	99.3	98.5	88.5	97.2	99.7	99.4	6.7		96.5	99.3	99.4	99.7	99.8	98.7
Gravel (%)	0	0.1		0	0	0	0.5	0	0	0	0		0	0	0	0	0	0
Medium Sand (%)	0.2	0.2		1.1	0.4	0.7	4.3	1.1	0.1	0.1	29.9		1.1	0.2	0.1	0	0.1	0.5
Grain Size (PCT/P)																		
GS06 Sieve 1.5" (37.5 mm)	100	100		100	100	100	100	100	100	100	100		100	100	100	100	100	100
GS07 Sieve 1" (25.0 mm)	100	100		100	100	100	100	100	100	100	100		100	100	100	100	100	100
GS08 Sieve 0.75" (19.0 mm)	100	100		100	100	100	100	100	100	100	100		100	100	100	100	100	100
GS09 Sieve 0.5" (12.5 mm)	100	100		100	100	100	100	100	100	100	100		100	100	100	100	100	100
GS10 Sieve 0.375" (9.5 mm)	100	100		100	100	100	100	100	100	100	100		100	100	100	100	100	100
Sieve No. 004 (4.75 mm)	100	99.9		100	100	100	99.5	100	100	100	100		100	100	100	100	100	100
Sieve No. 010 (2.00 mm)	99.9	99.9		99.6	100	99.8	96.8	99.6	100	100	99.9		99.2	100	100	100	100	99.9
Sieve No. 020 (850 um)	99.8	99.9		98.8	99.8	99.4	94.3	99	99.9	100	96.7		98.8	99.9	99.9	100	100	99.6
Sieve No. 040 (425 um)	99.7	99.7		98.5	99.6	99.1	92.5	98.5	99.9	99.9	70		98.1	99.8	99.9	100	99.9	99.4
Sieve No. 060 (250 um)	99.6	99.7		98.3	99.5	99	91	98	99.8	99	45		97.5	99.7	99.7	99.9	99.9	99.2
Sieve No. 140 (106 um)	99.4	99.5		98.2	99.3	98.6	89.1	97.4	99.8	99.5	6.9		96.6	99.5	99.5	99.8	99.9	98.9
Sieve No. 200 (75 um)	99.3	99.3		98.1	99.3	98.5	88.5	97.2	99.7	99.4	6.7		96.5	99.3	99.4	99.7	99.8	98.7

Notes:
J - Estimated result
NS - Not sampled
R - Rejected result
U - Not detected
UJ - Not detected, quantitation limit may be inaccurate
MG/KG - Milligrams per kilogram
PCT - Percent
PCT/P - Percent Passed

Vieques East
Laguna La Chiva
Validated Surface Soil Raw Analytical Data
May 2013

Sample ID	Veno-SS01-0002	Veno-SS01P-0002	VENO-SS02-0001	VENO-SS03-0001	Veno-SS04-0001	Veno-SS05-0002	VENO-SS06-0001	Veno-SS07-0002
Sample Date	5/14/2013 9:30	5/14/2013 9:30	5/16/2013 14:35	5/16/2013 14:20	5/14/2013 11:00	5/14/2013 10:30	5/16/2013 15:10	5/14/2013 13:30
Chemical Name								
Pesticide/Polychlorinated Biphenyls (UG/KG)								
4,4'-DDD	1.3 U	1.3 UJ	1.4 UJ	1.4 U	1.5 UJ	110 U	2 UJ	2.1 U
4,4'-DDE	1.3 U	1.3 UJ	1.4 UJ	1.4 U	1.5 UJ	2300	2 UJ	2.1 U
4,4'-DDT	1.3 UJ	1.3 UJ	1.4 UJ	1.4 UJ	1.5 UJ	110 UJ	2 UJ	2.1 UJ
Wet Chemistry								
pH (pH units)	8.1	NS	7.6	7.5	8.2	7.7	7.8	7.8
Total organic carbon (TOC) (MG/KG)	14000	NS	10000	8900	13000	22000	17000	24000
Grain Size (PCT)								
Coarse Sand (%)	0.7	NA	0.8	0	0.3	0.5	0.1	0.4
Medium Sand (%)	20.3	NA	1	0	3.7	27	4.2	22.6
Fine Sand (%)	62	NA	2.7	0.4	12.4	57.6	8.9	61.4
Fines (%)	17	NA	95.5	99.6	83.6	14.9	86.8	15.5
Gravel (%)	0	NA	0	0	0	0	0	0.1
GRAINSIZE (PCT/P)								
GS06 Sieve 1.5" (37.5 mm)	100	NA	100	100	100	100	100	100
GS07 Sieve 1" (25.0 mm)	100	NA	100	100	100	100	100	100
GS08 Sieve 0.75" (19.0 mm)	100	NA	100	100	100	100	100	100
GS09 Sieve 0.5" (12.5 mm)	100	NA	100	100	100	100	100	100
GS10 Sieve 0.375" (9.5 mm)	100	NA	100	100	100	100	100	100
Sieve No. 004 (4.75 mm)	100	NA	100	100	100	100	100	99.9
Sieve No. 010 (2.00 mm)	99.3	NA	99.2	100	99.7	99.5	99.9	99.5
Sieve No. 020 (850 um)	96.4	NA	98.7	100	99.1	96.1	98.9	96.9
Sieve No. 040 (425 um)	79	NA	98.2	100	96	72.5	95.7	76.9
Sieve No. 060 (250 um)	53.1	NA	97.5	99.9	91.5	42.8	92.3	43.9
Sieve No. 140 (106 um)	18.2	NA	96.2	99.8	84.8	15.7	87.6	16.3
Sieve No. 200 (75 um)	17	NA	95.5	99.6	83.6	14.9	86.8	15.5

Notes:
NS - Not sampled
NA - Not analyzed
U - Not detected
UJ - Not detected, quantitation limit may be inaccurate
UG/KG - Micrograms per kilogram
MG/KG - Milligrams per kilogram
PCT - Percent
PCT/P - Percent passing
PH - pH units

Appendix B
Data Quality Evaluation

Contents

Section Page

B Data Quality Evaluation 1-1

B.0 Data Quality Assessment 1-1
B.0.1 Laboratory Internal Quality Control Review 1-1
B.0.2 Data Validation 1-2
B.0.3 Primary Data Validation Qualifiers 1-3
B.0.4 Impact of Data Quality on Project Data Quality Objectives and Data Usability 1-4
B.0.5 Comparison of Nondetects to Screening Levels 1-5
B.0.5.1 Concentration Ranges for Sediment Pesticides 1-6
B.0.5.2 Concentration Ranges for Soil Pesticides 1-6
B.0.5.3 Alternative Analytical Techniques for Soil/Sediment Pesticides 1-7
B.0.5.4 Concentration Ranges for Sediment VOAs and SVOAs 1-7
B.0.6 Laboratory Qualifications, Data Validation Qualifiers, Data Validation Reason Codes, Data Availability, and Data Use 1-8
B.1 Vieques Laguna La Chiva Soil 1-8
B.1.1 Soil Pesticides 1-8
B.1.2 Soil Wet Chemistry 1-9
B.1.3 Soil Grain Size 1-9
B.2 Vieques Laguna La Chiva Sediment 1-9
B.2.1 Sediment VOA 1-9
B.2.2 Sediment SVOA 1-9
B.2.3 Sediment Pesticides 1-10
B.2.4 Sediment Wet Chemistry 1-10
B.2.5 Sediment Grain Size 1-10
B.3 PARCC Considerations 1-11
B.3.1 Precision 1-11
B.3.2 Accuracy 1-11
B.3.3 Representativeness 1-11
B.3.4 Completeness 1-12
B.3.5 Comparability 1-12
B.4 References 1-12

List of Tables

B-1 Comparison of Nondetects to Screening Levels

B-2 Data Availability and Use

APPENDIX B

Data Quality Evaluation

B.0 Data Quality Assessment

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

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

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

This document presents the results of the data quality evaluation performed on the data set corresponding to Laguna La Chiva (site), discrete surface soil and sediment (matrices), and May 14-17, 2013 (date range).

B.0.1 Laboratory Internal Quality Control Review

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

B.0.2 Data Validation

A third-party data validator reviewed all data packages using the validation criteria outlined in the site-specific UFP-SAP Worksheets #34-36 (CH2M HILL, 2013). For the most part, these Worksheets reference the appropriate Region II SOP if such an SOP exists for that analysis method. Then, UFP-SAP limits are used in place of those referenced in the SOP. If a Region II SOP does not exist for the analysis method, then the data are validated against the limits in the UFP-SAP. Guidance and qualifiers are taken from related Region II SOPs and guidance is taken from National Functional Guidelines. The following protocol was used for validation:

- For VOA via SW-846 8260B:
  - "Validation of Organic Data Acquired Using SW-846 Method 8260B (SOP HW-24, Rev. 2)" (August, 2008)
  - UFP-SAP limits for accuracy/precision (CH2M Hill, 2013)
  - Guidance from "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" (EPA, October, 1999) as needed
- For SVOA via SW-846 8270D:
  - "Validation of Organic Data Acquired Using SW-846 Method 8270D (SOP HW-22, Rev. 4)" (August, 2009)
  - UFP-SAP limits for accuracy/precision
  - Guidance from "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" as needed
- For PEST/PCB via SW-846 8081B:
  - "Validation of Organic Data Acquired Using SW-846 Method 8081B (SOP HW-44, Rev. 1)" (August, 2009)
  - UFP-SAP limits for accuracy/precision
  - Guidance from "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review" as needed

Although not subject to such stringent data validation, WCHEM and GRAINSIZE data were still subject to the verification and validation procedures outlined in Worksheets #34-36.

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

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

1. The non-rejected result
2. The result from the appropriate concentration range (dilution factor)
3. The detect when one or more result is detected and one or more result is nondetect

4. The greater of detects, and
5. The lesser of nondetects (U-Values).

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

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

In extreme cases, a result is rejected and deemed to be unusable. “Unusable” in this instance is defined as a result that is not analytically sound and is not generally considered available for use by the project team. In some cases, the project team may still decide to use a rejected result. An example of this occurrence would be if a result is rejected because it is biased extremely high, yet it is still below the screening level (SL). A conservative decision may be made to consider this result a non-exceedance, even if its concentration was rejected. For that reason, it is important to examine why a result was rejected. For the most part, however, rejected results are not usable, and the R-qualifier is the only qualifier that has an adverse effect on the availability of data.

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

B.0.3 Primary Data Validation Qualifiers

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

- **U** - Not detected. Sample was analyzed for this parameter, but it was not detected at greater than the reported LOD. The data validator may also apply this qualifier to indicate that a concentration

was not detected at significantly greater than that in an associated blank. Thus, this qualifier does not necessarily indicate a quality control exceedance.

- **UJ** – Not detected, LOD estimated. Sample was analyzed for this parameter, but it was not detected above the reported LOD. The LOD for this parameter is estimated due to a quality control exceedance.
- **J** - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample. Often, a J-qualifier is applied simply because the result was less than the limit of quantitation and thus does not necessarily indicate a quality control exceedance.
- **R** - Rejected. The result was rejected because quality control limits were exceeded. It may or may not have been detected by the laboratory. The presence or absence of the parameter cannot be verified and the result generally is not usable as detected or not detected.
- **[No qualifier present] -** Detected. Qualification was not warranted.

B.0.4 Impact of Data Quality on Project Data Quality Objectives and Data Usability

The laboratories analyzed the samples in accordance with EPA SW-846 methods. The data packages were reviewed by a data validator taking guidance from USEPA Region II Validation procedures.

The laboratory utilized various qualifiers to represent “below reporting limit,” “nondetect,” and “detected.” Any other extraneous laboratory qualifiers were superseded by data validation qualifiers. The data validator utilized J-qualifiers, UJ-qualifiers, U-qualifiers, and R-qualifiers to represent “estimated,” “nondetect, estimated LOD,” “nondetect or not detected at significantly greater than that in an associated blank,” and “rejected,” respectively. The only time the data validator changed a result’s detect status was when J-qualifiers were changed to U-qualifiers (detect to nondetect) as a result of blank contamination. There were also 181 instances where R-qualifiers were applied to nondetected data as a result of a surrogate spike recovery below QC limits.

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

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

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

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

B.0.5 Comparison of Nondetects to Screening Levels

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

- Sediment samples are compared to Adjusted Residential Soil EPA RSLs (November, 2013), EPA SSLs (Risk-Based if no MCL-Based; November, 2013) and Marine Sediment ESVs.
- Surface soil samples are compared to Adjusted Residential Soil RSLs, EPA SSLs, and Soil ESVs.

Nondetect results are also compared to SLs, typically during a risk assessment or exceedance screening, by comparing one-half the LOD to the SL. However, this is only done when the same constituent was

detected in another sample of the same matrix at the same site. The assumption is that, if the constituent is present in a given sample of a particular matrix at a site, then it may also be present at low concentrations (less than the LOD) in a nondetect sample of the same matrix from the same site. However, when a constituent was not detected in any samples of a particular matrix at a site, then it is considered not present at the site in that matrix. In this instance, it is important to compare the nondetect results to the SL. If the nondetect results (LODs) are not low enough when compared to the SL, then it may be possible that the constituent is present in a sample at greater than the SL but not detected or reported by the laboratory instrumentation. This situation is a common occurrence and is not cause for alarm. There are various typical reasons why this occurs and is expected. Please refer to section B.0.4, above.

B.0.5.1 Concentration Ranges for Sediment Pesticides

For this specific effort, the following reasons most-notably affected reporting limits:

- Matrix effects necessitating dilution
- High percent moisture (results and reporting limits are reported on a dry-weight basis). Sediment samples contained as much as 76% moisture.

All non-detect results (U-values) were less than the RSLs and SSLs.

In 12 samples, the LOD of one or more targeted pesticide was elevated to greater than the ESV. Of these 12 samples, six had detected exceedances for at least one target pesticide against the ESV. Therefore, in those six cases, the elevated reporting limits are inconsequential because the data user is forced to acknowledge that a detected exceedance (for a targeted pesticide against its ESV) occurred within that same sample.

In the remaining six cases, the DL should be considered because it is the level above which the instrumentation can distinguish a positive detection from noise.

Consider the “worst-case” example; VENO-SD04-0H01 has the most-elevated reporting limits for nondetect results and was 68.4% moisture. Note the narrow ranges of concentration which may be of interest when assessing added uncertainty. 4,4’-DDD (between 1.22 and 3ug/kg); 4,4’-DDE (between 2.2ug/kg and 3.3ug/kg) and/or 4,4’-DDT (between 1.19 and 4.2ug/kg) may have been detected at greater than the ESV yet not reported by the laboratory because such a detection would not be at a level which can be distinguished from noise (possible false positive if detected). If such resulting added uncertainty cannot be accepted, then the data user could calculate risk based on these concentrations.

Nondetect results (including for VENO-SD04-0H01) consisted of DLs both less than and greater than screening levels. For 4,4’-DDD, nondetect DLs ranged from 1 to 3ug/kg (ESV = 1.22ug/kg). For 4,4’-DDE, nondetect DLs ranged from 1.4 to 3.7ug/kg (ESV = 2.22ug/kg). For 4,4’-DDT, nondetect DLs ranged from 1.4 to 5.5ug/kg (ESV = 1.19ug/kg).

B.0.5.2 Concentration Ranges for Soil Pesticides

Reporting limits were elevated for the same reasons as for sediment samples. However, the effect is not as significant, and reporting limits are not as elevated as for sediment samples.

All non-detect (U-values) were less than the RSLs and ESVs. Percent moisture was not as significant an issue as for sediment samples.

There were only two instances (4,4’-DDD and 4,4’-DDT in VENO-SS05-0002) where the U-qualified result (LOD) exceeded the SSL. However, this sample also exhibited a detected exceedance for 4,4’-DDE

against the SSL. Therefore, the elevated reporting limits are inconsequential because the data user is forced to acknowledge that a detected exceedance (for a targeted pesticide against its SSL) occurred within that same sample.

B.0.5.3 Alternative Analytical Techniques for Soil/Sediment Pesticides

At the time of UFP-SAP preparation, it was determined that analysis was sufficiently-low concentration for the data needs. Although it may have been possible to predict high percent moisture values, it could not be predicted that matrix interference would be an issue. Lower-concentration analysis using routine methods is not available. Other laboratories may have marginally-lower reporting limits, but the difference is not expected to be significant. Specialty analysis methods may be available, either to eliminate interferences or to be such low-concentration that dilution and percent moisture can be tolerated. However, for the reasons described above, further analysis should not be necessary because the data user can still draw conclusions from this data set.

B.0.5.4 Concentration Ranges for Sediment VOAs and SVOAs

It should be noted that for sediment VOAs and SVOAs, there were no detected exceedances. There were very few detections overall.

Please refer to **Table B-1**. For the purpose of performing this comparison, the minimum of applicable SLs for each analyte is considered to be the SL for that analyte. One row (combination of matrix and analyte) was generated if there was at least one instance where a nondetect U-Value (LOD or detected result U-qualified due to blank contamination) exceeded a SL.

The number of detects is not presented because there were no detects for analytes where at least one nondetect U-value exceeded a SL. The number of nondetects and number of rejected points is presented. The minimum and maximum U-Values are further presented in **Table B-1**. The minimum U-Value is generally understood as the lowest LOD that the instrumentation can practically report considering the conditions at the site. The maximum U-Value is then generally understood as the LOD adjusted for the worst conditions (i.e. greatest dilution factors, matrix interference, and percent moisture). Because there is not a large spread (greatest factor is 5.3X) between the minimum and maximum U-Values, it is therefore concluded that the site conditions did not have a significant impact on the analysis for this data set. There are 1,573 nondetect (U- or UJ-qualified) data points in this data set. Of these, 764 nondetect data points exceeded the SL. They corresponded to 261 nondetect data points in the VOA fraction and 503 nondetect data points in the SVOA fraction. In most cases (42 shaded rows out of 58 analytes shown on **Table B-1**), the maximum U-Value exceeded the SL but the minimum U-Value did not. These are instances, represented by unshaded rows, where the LOD is usually low enough, but conditions necessitated elevating the LOD in one or more samples. In the remaining cases, the minimum U-Value exceeded the SL. These are instances, represented by rows shaded in yellow (or pink) where the concentration range is not low enough to practically report an LOD at less than the SL. In these instances, however, where the LOD > SL, the instrumentation may still be able to report a result, if an analyte is detected in a sample at greater than the SL, when the DL is less than the SL.

Therefore, when a U-Value exceeds a SL, it is worthwhile to consider the DL. Note that DLs, as reported by the laboratory and as presented in **Table B-1**, are “Adjusted DLs” in that they are adjusted for dilution factors, matrix interference, etc. This is synonymous with the adjustment of nondetect results (U-Values or LODs), and also detected results. The DL is the level at which the laboratory is able to distinguish a detection from noise, and therefore is able to report a detection. Furthermore, the laboratory will report (J-qualified as applicable) any detections at greater than the DL. The minimum and maximum DLs are also presented in **Table B-1**. A total of four rows (corresponding to 2-Hexanone, Benzene,

Ethylbenzene, and MTBE)) correspond to instances where the U-Value is greater than the SL in all samples but the DL is still less than the SL in all samples. A total of 38 rows (corresponding to 561 results, represented by rows shaded in pink) correspond to instances where the U-Value is greater than the SL and the DL is also greater than the SL for all nondetect results.

Looking at **Table B-1** from an analytical group standpoint, one can see that there are several affected analytes for VOAs and SVOAs. This phenomenon is due to unrealistically low SLs (established without considering current instrumentation technology) which the reporting limits could not meet.

For these instances where the DL is greater than the SL, the data user must understand that an analyte may be present in a sample at or at greater than the SL (but less than the DL), but the laboratory instrumentation may not be sensitive enough to detect it. This phenomenon is unavoidable when projects use a “full analysis group” approach and the project team is not able to focus on constituents of concern. Recall that pesticides were addressed separately in sections B.0.5.1 and B.0.5.2, above. This “full analysis group” approach is most-common for projects in the early stages of investigation. However, because there is no suspected release for any of these contaminants, it should not be necessary to demonstrate their absence at less than the SL. It is also worth noting that the achieved reporting limits are comparable to those required by the UFP-SAP and so the laboratory performed the analyses at the concentration ranges specified in the approved work plan.

B.0.6 Laboratory Qualifications, Data Validation Qualifiers, Data Validation Reason Codes, Data Availability, and Data Use

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

A total of 44.32% of the data are available for use as reported by the laboratory. A total of 47.86% of the data are available for use as qualified by the data validator. Altogether, a total of 92.18% of the data are available for use, qualified as applicable. A total of 7.82% of the data are rejected and not available for use. Data rejection occurred only for soil SVOAs. The UFP-SAP project completeness goal of “95% available data” was not met for this data set.

B.1 Vieques Laguna La Chiva Soil

The purpose of this data quality evaluation is to summarize the findings of the data validation and any effects on the availability of the soil data within Vieques Laguna La Chiva, as well as to provide an assessment of data usability. Soil samples were collected by CH2M HILL, Inc. on May 14, 2013 and May 16, 2013.

B.1.1 Soil Pesticides

4,4’-DDD, 4,4’-DDE, and 4,4’-DDT were analyzed via SW-846 8081B. The validation process resulted in the following qualifiers for results in the pesticides fraction:

Matrix	Analysis Group	Validator Qualifier	Reason Code	Count	Percent
Soil	PEST/PCB	UJ	SSL	12	50.00%
Soil	PEST/PCB	U	[none]	6	25.00%
Soil	PEST/PCB	UJ	CCL	4	16.67%
Soil	PEST/PCB	U	2C	1	4.17%
Soil	PEST/PCB	[none]	[none]	1	4.17%
				24	100.00%

100.00% not R-flagged and available for use

B.1.2 Soil Wet Chemistry

Wet chemistry (pH and TOC) were analyzed via SW-846 9045C and Walkley-Black, respectively. No qualifiers were deemed necessary or applied.

B.1.3 Soil Grain Size

Grain size (sieve-only, no hydrometer) was analyzed via ASTM D422. No qualifiers were deemed necessary or applied.

B.2 Vieques Laguna La Chiva Sediment

The purpose of this data quality evaluation is to summarize the findings of the data validation and any effects on the availability of the soil data within Vieques Laguna La Chiva, as well as to provide an assessment of data usability. Sediment samples were collected by CH2M HILL, Inc. on May 15, 2013 through May 17, 2013.

B.2.1 Sediment VOA

SOM01-List VOAs (excluding 1,4-Dioxane) were analyzed via SW-846 8260B. The validation process resulted in the following qualifiers for results in the VOA fraction:

Matrix	Analysis Group	Validator Qualifier	QC Narrative	Count	Percent
Sediment	VOA	U	[none]	341	37.15%
Sediment	VOA	UJ	%SOL	337	36.71%
Sediment	VOA	UJ	SSL	193	21.02%
Sediment	VOA	J	%SOL	20	2.18%
Sediment	VOA	J	SSL	11	1.20%
Sediment	VOA	J	[none]	9	0.98%
Sediment	VOA	[none]	[none]	5	0.54%
Sediment	VOA	UJ	FD	1	0.11%
Sediment	VOA	J	FD	1	0.11%
				918	100.00%

100.00% not R-flagged and available for use

B.2.2 Sediment SVOA

SOM01-List SVOAs (excluding PAHs) were analyzed via SW-846 8270D. The validation process resulted in the following qualifiers for results in the pesticides fraction:

Matrix	Analysis Group	Validator Qualifier	QC Narrative	Count	Percent
Sediment	SVOA	U	[none]	227	25.74%
Sediment	SVOA	UJ	SSL	196	22.22%
Sediment	SVOA	UJ	%SOL	196	22.22%
Sediment	SVOA	R	SSL	181	20.52%
Sediment	SVOA	UJ	HT	49	5.56%
Sediment	SVOA	UJ	CCH	21	2.38%
Sediment	SVOA	UJ	ICH	12	1.36%
				882	100.00%

79.48% not R-flagged and available for use

All R-flags were applied due to an extremely low recovery of a surrogate spike. The surrogate spike is used to ensure that target compounds are accurately recovered during the analytical process. The extremely low recovery indicates that there is a potential extreme low bias due to matrix interference. Therefore, related nondetects were R-qualified as “rejected” by the data validator.

R-qualified results are not available for use by the project team, but the data user can confidently draw conclusions using the remaining available data in the overall dataset. The only affected samples were VENO-SD04-000H, VENO-SD04-0H01, VENO-SD05-000H, and VENO-SD06-000H. There are still twelve other sediment samples with no SVOA detections associated with acceptable surrogate spike recoveries.

B.2.3 Sediment Pesticides

4,4’-DDD, 4,4’-DDE, and 4,4’-DDT were analyzed via SW-846 8081B. The validation process resulted in the following qualifiers for results in the pesticides fraction:

Matrix	Analysis Group	Validator Qualifier	QC Narrative	Count	Percent
Sediment	PEST/PCB	UJ	SSL	27	50.00%
Sediment	PEST/PCB	J	SSL	24	44.44%
Sediment	PEST/PCB	J	FD	2	3.70%
Sediment	PEST/PCB	J	CCL	1	1.85%
				54	100.00%

100.00% not R-flagged and available for use

B.2.4 Sediment Wet Chemistry

Wet chemistry (pH and TOC) were analyzed via SW-846 9045C and Walkley-Black, respectively. No qualifiers were deemed necessary or applied.

B.2.5 Sediment Grain Size

Grain size (sieve-only, no hydrometer) was analyzed via ASTM D422. No qualifiers were deemed necessary or applied.

B.3 PARCC Considerations

B.3.1 Precision

Precision is defined as the agreement between duplicate results and was characterized by comparing duplicate matrix spike recoveries, laboratory replicates, and field duplicate sample results. For this data set, precision was also assessed by examining dual-column reproducibility (percent difference between instrument columns). There is no actual significant negative impact on precision because no data points were deemed unusable (rejected) due to precision exceedances. Minor precision exceedances were noted. Please refer to **Table B-2**. Three detections were J-qualified as "estimated" and one nondetect was UJ-qualified as "nondetect, estimated reporting limit" due to field duplicate relative percent difference exceeding 30%. Affected analytes were 2-Butanone; 4,4'-DDD; and 4,4'-DDE. Because they are noted via the field duplicate, these are likely the result of matrix heterogeneity and not associated with analytical non-conformances. One detection (4,4'-DDD in VENO-SS05-0002) was U-qualified as "not detected" due to dual-column reproducibility because the data validator determined that the detection was not confirmed. These minor precision exceedances do not affect the overall reliability of the results because the affected (qualified but not rejected) results are available for use by the project team.

B.3.2 Accuracy

Accuracy is a measure of the agreement between an experimental determination and the true value of the parameter being measured. For organic analyses, each sample was spiked with surrogate compounds; and for organic and inorganic analyses, an MS/MSD and LCS were spiked with a known parameter concentration before preparation. Internal standards also provide a measure of accuracy. Internal standards, surrogates and MS/MSD provide a measure of the matrix effects on the analytical accuracy. LCS demonstrates accuracy of the method and the laboratory's ability to meet the method criteria. Accuracy is also assessed by calibration recoveries. There is a negative impact on accuracy due to QC exceedances because a significant number of data points were deemed unusable (rejected) due to accuracy exceedances (surrogate spike recovery). Refer to Section B.2.2, above. Minor accuracy exceedances were also noted, as shown in **Table B-2**. In addition to the rejected results discussed above, 463 results were J-qualified as "estimated" or UJ-qualified as "nondetect, estimated reporting limit" due to low spiked surrogate recovery. This comprised 63 pesticides results, 196 SVOC results, and 204 VOC results and is likely a result of matrix effects because the surrogate QC is sample-specific and confirmed by reanalysis. Although this may indicate a potential low bias, the exceedance is not severe enough to warrant rejection, and thus this does not affect the availability or reliability of the data. Twenty one nondetect results were UJ-qualified due to high recovery in the continuing calibration and 12 nondetect results were UJ-qualified due to high recovery in the initial calibration. Because this may indicate a potential high bias associated with nondetect data, the results are qualified simply to indicate that an exceedance has occurred, and there is no effect on the usability of the data set. A very small amount of data (four nondetects and one detection, all for pesticides) were UJ- or J-qualified due to low recovery in a continuing calibration. Continuing calibration exceedances may be due to analytical effects but can also be due to matrix effects. Although these minor accuracy exceedances may indicate a potential low bias, they do not affect the overall reliability of the results because the affected (qualified but not rejected) results are available for use by the project team.

B.3.3 Representativeness

Representativeness is a qualitative measure of the degree to which sample data accurately and precisely represent a characteristic environmental condition (in this case, nature and extent of contamination). Representativeness is a subjective parameter and is used to evaluate the efficacy of the sample planning

design. In terms of data quality, representativeness was assured because the sampling team followed approved standard operating procedures for sample collection and handling, and the laboratory followed approved standard operating procedures for sample handling, preparation, and analysis.

B.3.4 Completeness

For purposes of this DQE, completeness is defined as the percentage of measurements that are judged to be valid; validity being defined by the DQOs. Therefore, completeness is calculated as the number of analytically-sound results that are available for use compared to the total number of measurements made. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review; EPA 540/R-99/008; October, 1999; SOP HW-24 Validation of Organic Data Acquired Using SW-846 Method 8260B (Rev. 2, August, 2008), SOP HW-22 Validation of Organic Data Acquired Using SW-846 Method 8270D (Rev. 3, October, 2006); SOP HW-44 Validation of Organic Data Acquired Using SW-846 Method 8081B (Rev. 1, October, 2006) designate all results except those R-qualified as “rejected” to be available for use as analytically-sound results. The R-qualifier is the only qualifier that negatively affects a data point’s availability. Completeness is provided, above, for each combination of matrix and analysis group.

The overall completeness goal of 95% was not met for this data set; it was, however, met for each combination of matrix and analysis group with the exception of sediment SVOA.

B.3.5 Comparability

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

B.4 References

CH2M HILL. 2013. *Final Sampling and Analysis Plan, Laguna La Chiva Site Inspection/Remedial Investigation*. April.

EPA. 1999. *Contract Laboratory Program National Functional Guidelines for Organic Data Review.* October.

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

Tables

TABLE B-1

Comparison of Nondetects to Screening Levels

Laguna La Chiva No Action Decision Document

Former VNTR, Vieques, Puerto Rico

Group	Analyte	CAS	RSL[1,2]	SSL[1,3]	ESV[1]	# R	# ND	min ND[1]	max ND[1]	# U > SL	min ND DL[1]	max ND DL[1]	# ND DL > SL
VOA	1,1,2,2-Tetrachloroethane	79-34-5	560	0.026			18	1.1	5.8	18	0.3	1.7	18
VOA	1,1,2-Trichloroethane	79-00-5	160	1.6			18	1.1	5.8	14	0.7	3.5	5
VOA	1,1-Dichloroethane	75-34-3	3300	0.68			18	1.1	5.8	18	0.6	3.3	17
VOA	1,1-Dichloroethene	75-35-4	24000	2.5			18	1.1	5.8	7	0.7	3.6	2
VOA	1,2,4-Trichlorobenzene	120-82-1	6200	200	4.8		18	1.1	5.8	2	0.9	4.9	1
VOA	1,2-Dibromo-3-chloropropane	96-12-8	5.4	0.086			18	1.1	5.8	18	0.6	3.3	18
VOA	1,2-Dibromoethane	106-93-4	34	0.014			18	1.1	5.8	18	0.3	1.8	18
VOA	1,2-Dichloroethane	107-06-2	430	1.4			18	1.1	5.8	15	0.4	1.8	2
VOA	1,2-Dichloropropane	78-87-5	940	1.7			18	1.1	5.8	14	0.6	3.2	5
VOA	2-Hexanone	591-78-6	21000	7.9			18	2.8	14	5	1	5.2	
VOA	Benzene	71-43-2	1100	2.6			18	1.1	5.8	6	0.4	2.3	
VOA	Bromomethane	74-83-9	730	1.8			18	5.5	29	18	1	5.2	10
VOA	Carbon tetrachloride	56-23-5	610	1.9			18	1.1	5.8	10	0.7	3.5	5
VOA	cis-1,3-Dichloropropene	10061-01-5	1700	0.15			18	1.1	5.8	18	0.3	1.7	18
VOA	Ethylbenzene	100-41-4	5400	780	4		18	1.1	5.8	2	0.6	3.2	
VOA	Methylene chloride	75-09-2	36000	1.3			18	5.5	29	18	0.8	4	10
VOA	Methyl-tert-butyl ether (MTBE)	1634-04-4	43000	2.8			18	1.1	5.8	5	0.3	1.6	
VOA	Tetrachloroethene	127-18-4	8600	2.3	57		18	1.1	5.8	8	0.5	2.8	2
VOA	trans-1,3-Dichloropropene	10061-02-6	1700	0.15			18	1.1	5.8	18	0.3	1.8	18
VOA	Trichloroethene	79-01-6	440	1.8	41		18	1.1	5.8	11	0.6	2.9	4
VOA	Vinyl chloride	75-01-4	60	0.69			18	1.1	5.8	18	0.5	2.5	15
SVOA	2,4,5-Trichlorophenol	95-95-4	610000	3300	3	3	15	110	420	15	61	240	15
SVOA	2,4,6-Trichlorophenol	88-06-2	6100	13	6	3	15	110	420	15	63	250	15
SVOA	2,4-Dichlorophenol	120-83-2	18000	41		3	15	110	420	15	75	300	15
SVOA	2,4-Dimethylphenol	105-67-9	120000	320	29	3	15	110	420	15	78	310	15
SVOA	2,4-Dinitrophenol	51-28-5	12000	34		3	15	320	1300	15	130	500	15
SVOA	2-Chlorophenol	95-57-8	39000	57		3	15	110	420	15	86	340	15
SVOA	2-Methylphenol	95-48-7	310000	580	63	3	15	110	420	15	74	290	15
SVOA	3- and 4-Methylphenol	m&pCRESOL	310000	570	670	3	15	210	840	2	170	670	1
SVOA	4,6-Dinitro-2-methylphenol	534-52-1	490	2		3	15	320	1300	15	140	550	15
SVOA	Pentachlorophenol	87-86-5	890	10	360	3	15	320	1300	15	150	590	15
SVOA	1,1-Biphenyl	92-52-4	5100	8.7	17	4	14	110	290	14	100	270	14
SVOA	1,2,4,5-Tetrachlorobenzene	95-94-3	1800	5.8		4	14	110	290	14	73	200	14
SVOA	2,2'-Oxybis(1-chloropropane)	108-60-1	4600	0.11		4	14	110	290	14	86	240	14
SVOA	2,4-Dinitrotoluene	121-14-2	1600	0.28		4	14	110	290	14	76	210	14
SVOA	2,6-Dinitrotoluene	606-20-2	330	0.058	549	4	14	110	290	14	73	200	14
SVOA	2-Nitroaniline	88-74-4	61000	62		4	14	110	290	14	70	190	14
SVOA	3,3'-Dichlorobenzidine	91-94-1	1100	0.71		4	14	110	290	14	96	260	14
SVOA	4-Chloroaniline	106-47-8	2400	0.13		4	14	110	290	14	97	270	14
SVOA	4-Nitroaniline	100-01-6	24000	1.4		4	14	110	290	14	86	240	14

TABLE B-1

Comparison of Nondetects to Screening Levels

Laguna La Chiva No Action Decision Document

Former VNTR, Vieques, Puerto Rico

Group	Analyte	CAS	RSL[1,2]	SSL[1,3]	ESV[1]	# R	# ND	min ND[1]	max ND[1]	# U > SL	min ND DL[1]	max ND DL[1]	# ND DL > SL
SVOA	Atrazine	1912-24-9	2100	1.9		4	14	110	290	14	78	210	14
SVOA	bis(2-Chloroethoxy)methane	111-91-1	18000	11		4	14	110	290	14	67	180	14
SVOA	bis(2-Chloroethyl)ether	111-44-4	210	0.0031		4	14	110	290	14	97	270	14
SVOA	bis(2-Ethylhexyl)phthalate	117-81-7	35000	1400	182	4	14	110	290	7	89	250	4
SVOA	Butylbenzylphthalate	85-68-7	260000	200	63	4	14	110	290	14	98	270	14
SVOA	Dibenzofuran	132-64-9	7800	110	110	4	14	110	290	13	69	190	10
SVOA	Diethylphthalate	84-66-2	4900000	4700	6	4	14	110	290	14	79	220	14
SVOA	Dimethyl phthalate	131-11-3			6	4	14	110	290	14	65	180	14
SVOA	Di-n-butylphthalate	84-74-2	610000	1700	58	4	14	110	290	14	83	230	14
SVOA	Di-n-octylphthalate	117-84-0	61000	44000	61	4	14	110	290	14	70	190	14
SVOA	Hexachlorobenzene	118-74-1	300	13	6	4	14	110	290	14	85	230	14
SVOA	Hexachlorobutadiene	87-68-3	6100	0.5	1.3	4	14	110	290	14	84	230	14
SVOA	Hexachlorocyclopentadiene	77-47-4	37000	160		4	14	110	290	10	98	270	10
SVOA	Hexachloroethane	67-72-1	4300	0.48	73	4	14	110	290	14	78	210	14
SVOA	Isophorone	78-59-1	510000	22		4	14	110	290	14	76	210	14
SVOA	Nitrobenzene	98-95-3	4800	0.079	21	4	14	110	290	14	83	230	14
SVOA	n-Nitroso-di-n-propylamine	621-64-7	69	0.007		4	14	110	290	14	95	260	14
SVOA	n-Nitrosodiphenylamine	86-30-6	99000	57	28	4	14	210	580	14	150	400	14

Notes:

1. All numbers (except counts) are in ug/kg.
2. "RSLs" are Adjusted Residential Soil RSLs and are current as of November, 2013.
3. "SSLs" are MCL-based or else Risk-based if not MCL-based. They are current as of November, 2013.

One row is provided for each analyte where at least one nondetect U-Value exceeds the screening level. For each row, at least one nondetect DL also exceeded the screening level.

Rows are shaded in yellow if all nondetect U-Values exceeded the screening level.

Rows are shaded in pink if all nondetect DLs exceeded the screening level.

TABLE B-2

Data Availability and Use

Laguna La Chiva No Action Decision Document

Former VNTR, Vieques, Puerto Ricc

Lab_Qual	DV_Qual	DV_Qual_Code	Count	Percent	Available as Reported	Available as Qualified	Not Available	Comment
U (and UD)	U	[none]	574	24.79%	24.79%			Not detected by the laboratory and may have been the result of a dilution. The reported result is the LOD. No further qualification was necessary.
U (and UQ)	UJ	%SOL	533	23.02%		23.02%		Not detected by the laboratory and miscellaneous QA/QC exceedances were noted. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to high percent moisture.
[none]	[none]	[none]	442	19.09%	19.09%			Detected by the laboratory. No further qualification was necessary.
U (and UQ, UD, and UDQ)	UJ	SSL	428	18.49%		18.49%		Not detected by the laboratory and miscellaneous QA/QC exceedances were noted. May have been the result of a dilution. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to low spiked surrogate recovery.
U (and UQ)	R	SSL	181	7.819%			7.819%	Not detected by the laboratory and a miscellaneous QA/QC exceedance was noted. The reported result is the LOD. The result was rejected and is not available for use due to extremely low spiked surrogate recovery. This corresponds to 34 SVOCs compounds in VENO-SD04-000H and all (49) SVOCs compounds in each of VENO-SD04-0H01; VENO-SD05-000H; and VENO-SD06-000H.
UQ	UJ	HT	49	2.117%		2.117%		Not detected by the laboratory and miscellaneous QA/QC exceedances were noted. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to holding time exceedance.
U (and UQ)	UJ	CCH	21	0.9071%		0.9071%		Not detected by the laboratory. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to high continuing calibration recovery.
D (and Q and DPQ)	J	SSL	16	0.6911%		0.6911%		Detected by the laboratory and a miscellaneous QA/QC exceedance is noted. May have been the result of a dilution. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to low spiked surrogate recovery.
J (and JD and JDQ)	J	SSL	13	0.5616%		0.5616%		Detected by the laboratory at less than the LOQ and a miscellaneous QA/QC exceedance is noted. May have been the result of a dilution. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to low spiked surrogate recovery.
[none]	J	%SOL	12	0.5184%		0.5184%		Detected by the laboratory. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to high percent moisture.
U (and UQ)	UJ	ICH	12	0.5184%		0.5184%		Not detected by the laboratory and miscellaneous QA/QC exceedances were noted. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to high initial calibration recovery.

TABLE B-2

Data Availability and Use

Laguna La Chiva No Action Decision Document

Former VNTR, Vieques, Puerto Ricc

Lab_Qual	DV_Qual	DV_Qual_Code	Count	Percent	Available as Reported	Available as Qualified	Not Available	Comment
J	J	[none]	9	0.3888%	0.3888%			Detected by the laboratory at less than the LOQ. No further qualification was necessary. The result is available for use at the reported value as long as the data user understands that it is "estimated".
J	J	%SOL	8	0.3456%		0.3456%		Detected by the laboratory at less than the LOQ. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to high percent moisture.
[none]	J	SSL	6	0.2592%		0.2592%		Detected by the laboratory. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to low spiked surrogate recovery.
U (and UD)	UJ	CCL	4	0.1728%		0.1728%		Not detected by the laboratory. May have been the result of a dilution. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to low continuing calibration recovery.
D	J	FD	2	0.0864%		0.0864%		Detected by the laboratory and is the result of a dilution. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to field duplicate precision exceedance.
D	[none]	[none]	1	0.04320%	0.04320%			Detected by the laboratory and is the result of a dilution. No further qualification was necessary.
J	J	FD	1	0.04320%		0.04320%		Detected by the laboratory at less than the LOQ. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to field duplicate precision exceedance.
JD	J	CCL	1	0.04320%		0.04320%		Detected by the laboratory at less than the LOQ and is the result of a dilution. The result is available for use at the reported value as long as the data user understands that it is "estimated" due to low continuing calibration recovery.
JDQ	U	2C	1	0.04320%		0.04320%		Detected by the laboratory at less than the LOQ, is the result of a dliution, and miscellaneous QA/QC exceedances were noted. The data validator determined that the detection is not confirmed due to dual-column precision exceedance, applied a U-flag, and raised the result to the LOD (if less than the LOD). The result is available for use as a nondetect as long as the data user understands that it was detected then subsequently deemed "not detected" due to dual-column precision exceedance.
U	UJ	FD	1	0.04320%		0.04320%		Not detected by the laboratory. The reported result is the LOD. The result is available for use at the reported LOD as long as the data user understands that it is "not detected, LOD estimated" due to field duplicate precision exceedance.
		Totals:	**2315**	**100%**	**44.32%**	**47.86%**	**7.819%**	

Appendix C
Human Health Risk Assessment

Table of Contents

Section **Page**

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

1 Introduction **1-1**
1.1 Overview 1-1
1.2 Scope of the Risk Assessment 1-1
1.3 Potential Receptors 1-1

2 Data Evaluation **2-1**
2.1 Data Used in the HHRA 2-1
2.1.1 Surface Soil 2-1
2.1.2 Sediment 2-1
2.2 Selection of Chemicals of Potential Concern 2-1
2.2.1 COPC Screening Levels 2-1
2.2.2 Pesticide Concentrations Attributable to Normal Pest Control 2-2
2.2.3 COPC Screening Results 2-2
2.3 Hot Spot Evaluation 2-3

3 Exposure Assessment **3-1**
3.1 Exposure Pathways Quantified 3-1
3.2 Quantification of Exposure 3-1
3.2.1 Exposure Point Concentrations 3-1
3.2.2 Exposure Factors 3-1

4 Toxicity Assessment **4-1**
4.1 Non-Carcinogenic Toxicity Values 4-1
4.2 Carcinogenic Toxicity Values 4-1
4.3 Derivation of Dermal Toxicity Values 4-1

5 Risk Characterization **5-1**
5.1 Approach for Potential Non-Carcinogenic Effects 5-1
5.2 Approach for Potential Carcinogenic Effects 5-2
5.3 Summary of Risk Estimates 5-2
5.4 Chemicals of Concern 5-3
5.5 Uncertainty Analysis 5-3
5.5.1 Data Evaluation 5-3
5.5.2 Exposure Point Concentrations 5-3
5.5.3 Exposure Assumptions 5-4
5.5.4 Chemicals 100% Non-Detected in a Matrix 5-4

6 References **6-1**

Attachments

C-1 RAGS Part D Tables
C-2 Figures
C-3 Tables
C-4 ProUCL Output
C-5 Comparison of Detection Limits to Screening Levels
C-6 Analytical Data Used in the HHRA

Acronyms and Abbreviations

ABS_{GI}	gastrointestinal absorption factor
BSAF	Biota-to-sediment accumulation factor
Cal/EPA	California Environmental Protection Agency
CDI	Chronic Daily Intake
CCP	Comprehensive Conservation Plan
CEM	conceptual exposure model
COC	Chemical of Concern
COPC	Chemical of Potential Concern
CSF	Cancer Slope Factor
DOI	Department of Interior
EC	Exposure Concentration
ELCR	Excess Lifetime Cancer Risk
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration
ERP	Environmental Restoration Program
HHEM	Human Health Evaluation Manual
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
IRIS	Integrated Risk Information System
IUR	Inhalation Unit Risk
K_{ow}	Octanol-Water Partition Coefficient
$\mu g/m^3$	microgram per cubic meter
µg/kg	microgram per kilogram
MCL	Maximum Contaminant Level
PEF	Particulate Emission Factor
PPRTV	Provisional Peer-Reviewed Toxicity Value
PREQB	Puerto Rico Environmental Quality Board
RAGS	Risk Assessment Guidance for Superfund
RfC	Reference Concentration
RfD	Reference Dose
RME	Reasonable Maximum Exposure
ROD	Record of Decision
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SVOC	Semivolatile Organic compound
UCL	Upper Confidence Limit
USACE	United States Army Corps of Engineers
USFWS	US Fish and Wildlife Service
VNTR	Vieques Naval Training Range
VOC	Volatile Organic Compound
mg/m^3	milligram per cubic meter
mg/kg	milligram per kilogram
mg/kg-day	milligram per kilogram per day

SECTION 1

Introduction

1.1 Overview

This human health risk assessment (HHRA) was prepared for Laguna La Chiva ("the Site"), Atlantic Fleet Weapons Training Area – Former Vieques Naval Training Range, Vieques, Puerto Rico, based on the analytical data collected during the Site Inspection/Remedial Investigation in May 2013. The approach and assumptions used in the HHRA were presented in the Final Sampling and Analysis Plan (SAP; CH2M HILL, 2013) and the *Master Standard Operating Procedures, Protocols, and Plans* (CH2M HILL, 2010), hereinafter referred to as the Vieques Master HHRA protocol, for sites in the Vieques Environmental Restoration Program (ERP).

As presented in the HHRA protocol contained in the Vieques Master HHRA protocol, for sites in the Vieques ERP, and in accordance with the U.S. Environmental Protection Agency (EPA) guidance documents, this HHRA consists of a four-step evaluation process comprised of:

- Data evaluation
- Exposure assessment
- Toxicity assessment
- Risk characterization

1.2 Scope of the Risk Assessment

The HHRA was prepared in accordance with the SAP (CH2MHILL, 2013) and the Vieques Master HHRA protocol. The protocol is consistent with EPA Region II policy and EPA guidance, including: *Risk Assessment Guidance for Superfund (RAGS), Volume 1: Human Health Evaluation Manual, Parts A, D, E, and F* (EPA, 1989, 2001, 2004, 2009), and *Human Health Evaluation Manual (HHEM), Standard Default Exposure Factors* (EPA, 1991). In addition, other EPA guidance documents were used and are cited in the text and tables.

1.3 Potential Receptors

The former Vieques Naval Training Range (VNTR) was transferred to the Department of Interior (DOI) in 2003 to be managed by US Fish and Wildlife Service (USFWS) as part of the National Wildlife Refuge System, pursuant to Section 1049 of the National Defense Authorization Act for Fiscal Year 2002 (Public Law 107-107). A Comprehensive Conservation Plan (CCP) for the Vieques National Wildlife Refuge was completed by USFWS, which outlines the land use plan for managing the former VNTR as a wildlife refuge (DOI, 2007). The beach just south of the lagoon is currently open to the public. Laguna La Chiva is accessible to the public for recreational fishing, which can include targeting various marine fish species and aquatic crabs. The primary access point is along the recently replaced vehicle bridge that crosses a deep (approximately 5 feet) channel on the south side of the lagoon. A portion of the bridge was built out to provide protected access for the public to fish from the bridge. In addition, anglers can access a short segment (about 100 feet) of the southern end the lagoon channel at its confluence with the Caribbean Sea along Play La Chiva (a.k.a. Blue Beach), which is typically plugged by sand that blocks tidal exchanges with the sea. The remainder of the lagoon perimeter is densely vegetated, much of it thorny, and the water is shallow with extensive soft mud flats. These conditions would generally deter fishing activities in other areas around the lagoon.

Consistent with the Vieques Master HHRA protocol, the following potential/hypothetical receptors were evaluated in the HHRA:

- **Current/Future Recreational Users/Trespassers/Site Visitors** – children (ages 1-6), youth (ages 6-16), and adults who may use the site for recreational purposes
- **Current/Future Fish and Blue Crab Consumers** – children (ages 1-6), youth (ages 6-16), and adults who may consume fish and blue crabs caught in the lagoon
- **Future Residents** – child (ages 1-6) and adult residents, assuming that the site is developed for residential use

- **Future Maintenance Workers** – workers who may be involved in grounds maintenance or landscaping activities. Maintenance workers are assumed to be USFWS workers. However, there is no specific planned future use of the site by USFWS. Therefore, the default maintenance worker presented in the final HHRA Protocol (CH2M HILL, 2010) was evaluated in the HHRA for Laguna La Chiva
- **Future Industrial Workers** – indoor/outdoor workers, assuming that the site is developed as an industrial facility
- **Future Construction Workers** – workers who may be involved in construction activities

The preliminary human health conceptual exposure model (CEM) presents potential exposure media, exposure points, receptors (current and future), and exposure routes, and is provided in **Table 1 of Attachment C-1** and graphically in **Figure 1 of Attachment C-2**. Although trespassers and site visitors could access the site and be potentially exposed populations, their exposure potential and duration are considerably lower than most receptors listed above and are similar to the recreational scenario. Therefore, the recreational exposures quantified in the HHRA adequately represent potential exposures by trespassers and site visitors and quantitative risk evaluations for trespassers and site visitors are not presented separately in the HHRA. Fish and blue crab consumers may have direct contact with sediment and surface water at the lagoon, and these exposure pathways (associated with sediment only due to the lack of surface water data) are quantified under a recreational user/trespasser/site visitor exposure scenario. Since surface water samples were not collected at the Site, uncertainties associated with not quantifying the surface water exposure pathway in the HHRA are discussed in Section 5.5. The exposure frequency and duration assumed for potential recreational users/trespassers/site visitors were used as conservative estimates for sediment exposures by potential fish or blue crab consumers.

SECTION 2

Data Evaluation

2.1 Data Used in the HHRA

The analytical data used in the HHRA consist of surface soil and sediment data collected during the Site Inspection/Remedial Investigation conducted in May, 2013. The locations of surface soil and sediment samples used in the HHRA are depicted in **Figure 2-4** of the No Action Decision Document. A summary of the samples used in the HHRA and the data groupings based on exposure medium and potential exposure area are presented in **Table 1 of Attachment C-3**. A complete copy of the analytical dataset for the samples used in the HHRA is presented in **Attachment C-6**.

2.1.1 Surface Soil

The surface soil dataset consists of 7 samples collected from the 0-1 and 0-2 foot below ground surface (bgs) intervals. Soil samples were analyzed for 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT in accordance with the agency-approved SAP (CH2MHILL, 2013).

2.1.2 Sediment

The sediment dataset consists of 14 samples collected from the 0-0.5 foot bgs and 0.5-1 foot bgs intervals. For the exposure scenario addressing direct contact with chemicals in sediment, sediment samples collected from areas where the water depth is less than 3 feet were used. The shallow sediment samples collected from the 0-0.5 foot interval were used for the food chain modeling of chemicals into fish and blue crab. Sediment samples collected from the lagoon were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT in accordance with the agency-approved SAP (CH2MHILL, 2013).

2.2 Selection of Chemicals of Potential Concern

The chemicals of potential concern (COPCs) are those chemicals that have the greatest potential to cause adverse human health effects if receptors come in contact with site media. COPCs were selected in accordance with the Vieques Master HHRA protocol (CH2M HILL, 2010). Chemicals that were 100 percent non-detected in an exposure medium were not selected as COPCs for that medium/data grouping.

For samples with field duplicate analyses, the higher of the two concentrations was used when both values were detected and the lower of the two reporting limits was used when both values were non-detected. In cases where one result was detected and the other non-detected, the detected value was used.

2.2.1 COPC Screening Levels

The EPA's Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (EPA, 2013a) were used to screen site data. The maximum detected concentrations in surface soil and sediment (direct contact pathway only) were compared to RSLs to identify COPCs for the HHRA. The RSLs are based on a target excess lifetime cancer risk (ELCR) of $1x10^{-6}$ and a non-cancer hazard quotient (HQ) of 1. The RSLs for non-carcinogenic effects were adjusted downward by a factor of 10 to account for cumulative non-cancer effects

In accordance with the Vieques Master HHRA protocol, the RSLs used for each receptor/sample population are indicated below:

- **Recreational Users/Trespassers/Site Visitors** – Concentrations detected in soil samples collected from the 0-2 foot interval and sediment samples from the lagoon (in areas where the water depth is less than 3 feet) were compared to adjusted residential soil RSLs to evaluate COPCs for direct contact exposures with soil and sediment.
- **Residents** - Concentrations detected in soil samples collected from the 0-2 foot interval were compared to adjusted residential soil RSLs.

- **Maintenance Workers/ Industrial Workers/ Construction Workers** – Concentrations detected in soil samples collected from the 0-2 foot interval were compared to adjusted industrial soil RSLs.
- **Fish Consumers/Blue Crab Consumers** – Sediment data were used to select COPCs for the fish and blue crab ingestion exposure pathway. Since sediment screening levels addressing ingestion of aquatic organisms are not available, selection of COPCs was conducted based on a constituent's potential to bioaccumulate in organisms. Organic constituents detected in sediment were identified as COPCs if their Log octanol-water partition coefficient (log K_{ow}) value exceeded 3.

2.2.2 Pesticide Concentrations Attributable to Normal Pest Control

It is possible that the pesticide concentrations detected in surface soil and lagoon sediment are the result of normal pesticide use associated with historic military training at and adjacent to Play La Chiva. Play La Chiva was one of the two most frequently used beaches for amphibious landing training (TAMS, 1979). Though there are no records available, it is likely that pesticides were used to control insects during training events, especially in and around the lagoon, which would likely have been (and still is) prime mosquito habitat. While the pesticide concentrations detected in surface soil and sediment samples may be associated with normal pesticide use, rusted pieces of several drums were observed around the lagoon, with the majority being observed on the northeast and west banks of the northwestern branch of the lagoon. Since pesticides would likely have been stored and transported in drums, the drum remnants offer another potential explanation for the source of pesticides in the lagoon (i.e., discarding of drums containing pesticide residues). The detected concentration of 4,4'-DDE in Laguna La Chiva surface soil was compared to the maximum concentration of 4,4'-DDE detected in Vieques soils and attributed to normal pesticide use (3,990 µg/kg), a value based on the record of decision (ROD) for Area of Concern (AOC) H which presented a no action determination indicating there is no unacceptable risk over that of background to human health or the environment under current or potential future site use (**Tables 2.1 and 2.1a of Attachment C-1**). At AOC H, 4,4'-DDE was detected in 22 of 32 surface soil samples ranging from 1.4 to 3,990 µg/kg. This maximum 4,4'-DDE concentration is greater than the maximum soil concentration of 4,4'-DDE (2,300 µg/kg) at Laguna La Chiva. Although 4,4'-DDE was detected at Laguna La Chiva at concentrations less than the established maximum concentration from normal pesticide application, it was not eliminated as a COPC based on the comparison and was carried forward to risk estimates in the HHRA.

2.2.3 COPC Screening Results

The analytes with maximum detected concentrations exceeding screening levels were identified as COPCs for soil and sediment (direct contact pathways only). For consumption of aquatic organisms, COPCs were identified based on sediment data, using the qualitative approaches discussed in Section 2.2.1. Results of the COPC screening process for each environmental medium and receptor group are presented in **Tables 2.1 through 2.3 of Attachment C-1** and are summarized below:

Recreational Users/Trespassers/Site Visitors:

- 4,4'-DDE was identified as a COPC in surface soil for the direct contact exposure pathways (**Table 2.1 of Attachment C-1**).
- No COPCs were identified in sediment for the direct contact exposure pathways (**Table 2.2 of Attachment C-1**).

Residents:

- 4,4'-DDE was identified as a COPC in surface soil for the direct contact exposure pathways (**Table 2.1 of Attachment C-1**).

Maintenance Workers/Industrial Workers/Construction Workers:

- No COPCs were identified in surface soil for the direct contact exposure pathways (**Table 2.1a of Attachment C-1**).

Fish Consumers/Blue Crab Consumers:

- Three pesticides (4,4'-DDD, 4,4'-DDE, and 4,4'-DDT) were identified as COPCs for the fish/blue crab consumption pathways (**Table 2.3 of Attachment C-1**).

2.3 Hot Spot Evaluation

A review of site data was conducted to determine if potential hot spots were present in exposure media that may require a separate exposure evaluation. The detected concentrations were compared to 10 times the adjusted residential soil RSLs (i.e., resulting in an HQ = 1.0 and ELCR of $1x10^{-5}$) to determine the presence (if any) of a discrete area where concentrations are considerably higher than those present in the surrounding area. As seen in **Table 2.1 of Attachment C-1**, the maximum detected concentration of 4,4-DDE was less than 10 times the adjusted residential soil RSL. Therefore, it was concluded that no discrete hot spots are present.

SECTION 3

Exposure Assessment

3.1 Exposure Pathways Quantified

In accordance with the Vieques Master HHRA protocol, various potential exposure pathways were quantified in the HHRA. The potential exposure pathways quantified for each receptor group are presented below:

- Recreational Users/Trespassers/Site Visitors – Ingestion, dermal contact, and inhalation exposures to COPCs in surface soil (0-2 feet) were quantified for potential current and future adult, youth, and child recreational users; exposure point concentrations (EPCs) are presented in **Table 3.1 of Attachment C-1**.
- Residents – Ingestion, dermal contact, and inhalation exposures to COPCs in surface soil (0-2 feet) were quantified for potential future adult and child residents; EPCs are presented in **Table 3.1 of Attachment C-1**.
- Fish Consumers/Blue Crab Consumers – Ingestion exposures to COPCs in fish and blue crab in the lagoon were quantified for potential current and future adult, youth, and child consumers.

  Fish and blue crab EPCs were modeled using sediment concentrations and biota-to-sediment accumulation factors (BSAFs). The BSAFs used to model fish and blue crab concentrations from sediment were obtained from EPA's (2008) Biota-Sediment Accumulation Factor Data Set. Several factors (e.g., level of sediment contamination used in the study, fish habitat, edible species) were taken into consideration when selecting appropriate BSAFs for the HHRA. The sediment EPCs used to model fish and blue crab concentrations are presented in **Table 3.2 of Attachment of C-1**. The BSAFs are presented in **Table 3.2 Supplement A of Attachment C-1**. The output from EPA's (2008) Biota-Sediment Accumulation Factor Data Set and the selection of the BSAFs for organic COPCs are presented in **Table 2 of Attachment C-3**. The parameters used to model fish and blue crab EPCs in units of milligram (mg) of chemical per kilogram (kg) of fish or blue crab on a wet weight basis included: a site-specific organic carbon content in lagoon sediment (4.6%), the EPA's default value for percent moisture in fish (75%)(1993), the EPA's default value for fish lipid content (5%)(2000), and the arithmetic mean crab lipid content (3.8%) from the USACE's BSAF database (2009). The calculation of the site-specific organic carbon content in lagoon sediment is presented in **Table 3.2 Supplement B of Attachment C-3**.

3.2 Quantification of Exposure

To evaluate the potentially complete exposure pathways further, the magnitude, frequency, and duration of exposures were estimated and quantified. EPCs were identified and pathway-specific intakes were estimated. EPA guidance (1989) recommends selecting intake variable values for a given pathway so that the combination of all intake variable values results in an estimate of the reasonable maximum exposure (RME) for that pathway. EPA recommends using upper-bound parameter values (as opposed to average values) for exposure frequency and exposure duration. EPA guidance also recommends that the contact rate be a value representing the 95th percentile.

3.2.1 Exposure Point Concentrations

Based on the Vieques Master HHRA protocol, calculation of the upper confidence limit (UCL) of the mean concentration requires at least 8 available samples within a sample group. The surface soil data grouping has less than 8 samples and one detection of the COPC; therefore, the UCL of the mean was not calculated and the maximum detected concentration was used in place of the UCL as the EPC for 4,4'-DDE in surface soil. For the COPCs identified for the fish and blue crab consumption pathways, the UCL on the mean concentration in sediment was calculated using the most recent version of ProUCL (Version 4.1.01; EPA, 2011). The EPCs used in the intake calculations are presented in **Tables 3.1 through 3.2 of Attachment C-1** and the ProUCL output is provided in **Attachment C-4**.

3.2.2 Exposure Factors

An RME scenario was quantified for potential current and future receptors (EPA, 1989). The exposure factors used in the intake calculations are presented in **Tables 4.1 through 4.5 of Attachment C-1.** The primary references for

exposure factors are standard default exposure factors presented in EPA guidance (EPA, 1989; EPA, 1991; EPA, 2002; EPA, 2004; EPA, 2013a).

A site-specific particulate emission factor (PEF) was calculated for use in intake estimates for recreational users and residents (**Table 4 Supplement A of Attachment C-1**). The PEF was calculated using Equation 4-5 and Exhibit D-2 of the *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (EPA, 2002). Climate Zone 9 (based on Miami, FL) and a 1.6-acre areal extent of site contamination were used in the site-specific PEF calculations. The areal extent of site contamination was estimated, conservatively assuming an approximate 300-foot diameter circle centered at the location [VENOSS005] where 4,4'-DDE exceeded the RSL.

In accordance with the methodology used to establish the EPA RSLs for soil (EPA, 2013a), the dermal exposure route for soil was quantified for 4,4'-DDE using a dermal absorption fraction from soil value of 0.1, as presented in Exhibit 3-4 of the EPA's *RAGS Volume I: HHEM (Part E, Supplemental Guidance for Dermal Risk Assessment*; EPA, 2004).

SECTION 4

Toxicity Assessment

The following hierarchy of sources was used to obtain toxicity data for COPCs (EPA, 2003):

- Integrated Risk Information System (IRIS) (EPA, 2013b);
- Provisional Peer-Reviewed Toxicity Values (PPRTVs); and
- Other Peer-Reviewed Sources (e.g., California Environmental Protection Agency [Cal/EPA] Toxicity Criteria Database [Cal/EPA, 2013]).

Non-cancer toxicity values used for COPCs in the HHRA are presented in **Tables 5.1 and 5.2 of Attachment C-1**. Cancer toxicity values for COPCs are provided in **Tables 6.1 and 6.2 of Attachment C-1.**

4.1 Non-Carcinogenic Toxicity Values

Non-carcinogenic toxicity values (oral reference dose [RfDs]) were used in estimating potential adverse health effects associated with exposure to COPCs. An inhalation reference concentration (RfC) was not available for the COPC in surface soil. Chronic toxicity data for potential non-carcinogenic effects of COPCs are presented in **Tables 5.1 and 5.2 of Attachment C-1**.

4.2 Carcinogenic Toxicity Values

Carcinogenic toxicity values (cancer slope factors [CSFs] and inhalation unit risks [IURs]) were used in evaluating potential carcinogenic effects associated with exposure to known, probable, or possible carcinogens having an EPA weight-of-evidence classification of A, B, or C, respectively. CSFs and IURs were used to estimate upper-bound lifetime statistical probabilities of a hypothetical individual developing cancer as a result of exposure to a potential carcinogen. Toxicity data for potential carcinogenic effects for COPCs are presented in **Tables 6.1 and 6.2 of Attachment C-1**.

4.3 Derivation of Dermal Toxicity Values

In general, oral RfDs and CSFs are converted to dermal RfDs and CSFs using a gastrointestinal absorption factor (ABS_{GI}). The values used for this conversion were obtained from *RAGS Part E* Section 4.2 and Exhibit 4-1 (EPA, 2004). Following EPA's recommendation (EPA, 2004), such a conversion is necessary only when a chemical has an ABS_{GI} of less than 50%. Since the ABS_{GI} for the one COPC in surface soil (4,4'-DDE) is greater than 50%, the oral RfD and CSF were used as the dermal RfD and CSF without adjustment. The dermal RfD and CSF for 4,4'-DDE are included in **Table 5.1** and **Table 6.1 of Attachment C-1**, respectively.

SECTION 5

Risk Characterization

Potential human health risks are discussed separately for carcinogenic and non-carcinogenic COPCs due to the different toxicological endpoints, relevant exposure durations, and methods used to estimate risk. EPA Superfund guidance considers an acceptable site ELCR range to be within 1 to 100 in a million ($1x10^{-6}$ to $1x10^{-4}$). Generally, remedial actions are not warranted for site media with an ELCR of $1x10^{-4}$ or below, or a Hazard Index (HI) of 1 or less, although it may be warranted if a standard (e.g., maximum contaminant level [MCL]) is exceeded, or if other site-specific information suggests to risk managers that action is appropriate.

5.1 Approach for Potential Non-Carcinogenic Effects

The HHRA evaluated the potential for non-carcinogenic effects by comparing exposure intakes of each COPC over a specified time period (chronic) with RfDs derived for similar exposure periods. In EPA methodology, this ratio of exposure to toxicity is referred to as a HQ. The HQ assumes that there is a level of exposure below which it is unlikely for even sensitive populations to experience adverse health effects. If the exposure level exceeds this threshold, there is the potential for non-cancer health effects to occur. The HQ is calculated as follows:

$$HQ = \frac{I}{RfD}$$

Where:

HQ = Hazard quotient

I = Intake level (mg/kg-day)

RfD = Reference dose (mg/kg-day)

Intake and RfD are expressed in the same units (mg/kg-day) and represent the same exposure period. A HQ that exceeds 1 (i.e., intake exceeds the RfD) indicates that there is a potential for adverse health effects associated with exposure to that COPC.

To assess the potential for non-carcinogenic health effects posed by exposure to multiple COPCs and exposure routes, an HI approach was used (EPA, 1989). This approach assumes that non-carcinogenic hazards associated with exposure to more than one COPC and exposure route are additive. Synergistic or antagonistic interactions between COPCs are not quantified. The HI may exceed 1 even if all of the individual HQs are less than 1. The HI is equal to the sum of the HQs and is calculated as follows:

$$HI = \frac{I_1}{RfD_1} + \frac{I_2}{RfD_2} + \ldots \frac{I_i}{RfD_i}$$

Where:

HI = Hazard index

I = Intake level (mg/kg-day)

RfD = Reference dose (mg/kg-day)

I_i = Intake level for the "*i*"th constituent

RfD_i = Reference dose for the "*i*"th constituent

5.2 Approach for Potential Carcinogenic Effects

The potential for carcinogenic effects due to exposure to site media was evaluated by estimating the ELCR. The ELCR is the incremental increase in the probability of developing cancer during one's lifetime (as a result of exposure to site media) above the probability of developing cancer from non-site exposures.

Potential ELCRs associated with exposure to individual carcinogens were calculated using CSFs and chronic daily intakes (CDIs) for oral and dermal contact exposures and IURs and ECs for inhalation exposures. The linear low-dose equation was used to estimate the incremental probability of an individual developing cancer over a lifetime as a result of exposure to potential carcinogens. Estimated ELCRs are calculated by multiplying the CDI by the CSF or EC by the IUR:

$$ELCR = CDI \times CSF \quad \text{or} \quad ELCR = EC \times IUR$$

Where:

ELCR = unitless probability of developing cancer

CDI = chronic daily intake (mg/kg-day)

CSF = cancer slope factor $(mg/kg\text{-}day)^{-1}$

EC = exposure concentration [microgram per cubic meter ($\mu g/m^3$)]

IUR = inhalation unit risk $(\mu g/m^3)^{-1}$

The theoretical probability of developing cancer as a consequence of exposure to two or more COPCs and by two or more exposure pathways was calculated by summing the risk estimates for each COPC in the appropriate scenarios using the following equation:

$$Total\ ELCR = (CDI_1 \times CSF_1) + (CDI_2 \times CSF_2) + \ldots (CDI_i \times CSF_i) +$$
$$(EC_1 \times IUR_1) + (EC_2 \times IUR_2) + \ldots (EC_i \times IUR_j)$$

Where:

CDI = Chronic daily intake (mg/kg-day)

CSF = Cancer slope factor $(mg/kg\text{-}day)^{-1}$

CDI_i = Chronic daily intake for the '*i*'th constituent

CSF_i = Cancer slope factor for the '*i*'th constituent

EC = Exposure concentration ($\mu g/m^3$)

IUR = Inhalation unit risk $(\mu g/m^3)^{-1}$

EC_j = Exposure concentration for the 'j'th constituent

IUR_j = Inhalation unit risk for the '*j*'th constituent

5.3 Summary of Risk Estimates

Potential exposures to soil, fish, and blue crab were quantified for the RME scenarios identified below. The calculated ELCRs and HIs are as follows:

- **Recreational Users/Trespassers/Site Visitors – Current/Future Scenario –**

  Surface soil (ingestion, dermal contact, and inhalation);

  - Adult: $2x10^{-7}$ ELCR (**Table 7.1**, summarized **in Table 9.1 of Attachment C-1**)
  - Youth: $1x10^{-7}$ ELCR (**Table 7.2**, summarized **in Table 9.2 of Attachment C-1**)
  - Child: $3x10^{-7}$ ELCR (**Table 7.3**, summarized **in Table 9.3 of Attachment C-1**)

- **Fish Consumers – Current/Future Scenario – Fish (ingestion);**
  - Adult: $3x10^{-5}$ ELCR, all target organ-specific HI <1 (**Table 7.4**, summarized in **Table 9.4 of Attachment C-1)**
  - Youth: $2x10^{-5}$ ELCR, all target organ-specific HI <1 (**Table 7.5**, summarized in **Table 9.5 of Attachment C-1)**
  - Child: $1x10^{-5}$ ELCR, all target organ-specific HI <1 (**Table 7.6**, summarized in **Table 9.6 of Attachment C-1)**
- **Blue Crab Consumers (Adult) – Current/Future Scenario – Blue Crab (ingestion);**
  - Adult: $5x10^{-5}$ ELCR, all target organ-specific HI <1 (**Table 7.7**, summarized in **Table 9.7 of Attachment C-1)**
  - Youth: $3x10^{-5}$ ELCR, all target organ-specific HI <1 (**Table 7.8**, summarized in **Table 9.8 of Attachment C-1)**
  - Child: $3x10^{-5}$ ELCR, all target organ-specific HI <1 (**Table 7.9**, summarized in **Table 9.9 of Attachment C-1)**
- **Residents (Child/Adult) – Future Scenario Soil – Surface Soil (ingestion, dermal contact, and inhalation);**
  - Adult/Child Aggregate: $2x10^{-6}$ cumulative ELCR (**Table 7.12**, summarized in **Table 9.12 of Attachment C-1**)

5.4 Chemicals of Concern

In general, chemicals of concern (COCs) are identified when the potential ELCR or HI for a receptor group exceeds EPA threshold values (a total ELCR of $1x10^{-4}$ or a target organ-specific HI of 1) and concentrations are site-related and above background levels. When a potential ELCR of $1x10^{-4}$ is exceeded for an exposure medium for a receptor group, the COPCs above background levels and posing an individual ELCR greater than $1x10^{-6}$ in the environmental medium responsible for the unacceptable risks are identified as COCs. When a potential target organ-specific HI exceeds 1 for an exposure medium for a receptor group, the COPCs above background levels and posing a HQ greater than 0.1 for that target organ in the environmental medium responsible for the unacceptable HI are identified as COCs. Factors such as nature of contamination source, laboratory contamination, and common pesticide use (unrelated to spills, improper storage disposal or use) are typically considered when identifying COCs.

Risk estimates for current and future receptor groups were within EPA acceptable levels. Therefore, no COCs were identified.

5.5 Uncertainty Analysis

The assumptions used in the HHRA have inherent uncertainty. While it is theoretically possible that this leads to underestimates of potential risk, the use of numerous upper-bound assumptions most likely results in conservative estimates of potential risk. A receptor group's potential exposure and subsequent potential risk are influenced by the exposure scenario and dose/response and vary on a case-by-case basis. The key assumptions in the HHRA and their influence on the numerical risk estimates are presented below in **Table 5-1**. Additionally, specific uncertainties associated with the HHRA for Laguna La Chiva are discussed below.

5.5.1 Data Evaluation

No surface water samples were collected from the lagoon during the Site Inspection/Remedial Investigation in May 2013. Therefore, there is some uncertainty regarding potential risks associated with exposure to chemicals in surface water by current and future recreational receptors. However, based on the chemicals and levels of detections in lagoon sediment (mainly, low level VOCs and pesticides), the chemicals in lagoon surface water are not expected to pose significant health risk to human receptors.

5.5.2 Exposure Point Concentrations

In this HHRA, several conservative approaches were taken to calculate EPCs with the intention of yielding health-protective risk estimates. For example, the maximum detected concentration of 4,4'-DDE in surface soil was selected as the EPC because there were less than eight surface soil samples. Using the maximum detected concentration as the EPC will likely lead to an overestimation of actual exposure because receptors are assumed to be exposed to the maximum detected concentration for their entire exposure duration.

5.5.3 Exposure Assumptions

In accordance with EPA guidance and the Vieques Master HHRA protocol (CH2M HILL, 2010a), exposure estimates were calculated for a RME scenario. A RME scenario results in upper-bound exposure estimates and likely overestimates actual site exposures. For instance, potential health risks associated with consumption of fish and blue crab from Laguna la Chiva were evaluated using an exposure frequency of 7 days per week (i.e., 365 days per year) based on the study conducted by Burger and Gochfeld (1991). According to the results of the survey conducted during the ATSDR's Public Health Assessment Fish and Shellfish Evaluation study (ATSDR, 2003), approximately two thirds of the respondents (Vieques Island residents [n=51]) reported to eat fish 1-2 times or less per week. The EPA's default fish ingestion rate (227 grams/meal for an adult) was used in the HHRA to evaluate consumption of fish and blue crab. The EPA's fish ingestion rate is less than the mean fish ingestion rate (284 grams/day) provided in the study by Burger and Gochfeld (1991). The fish ingestion rate of 284 grams/day was estimated based on Frontera fisherman consuming approximately 80 percent of a tilapia fish with an average weight of 355 grams. Even though the EPA's consumption rate is less than the value provided by Burger and Gochfeld (1991), the conservative exposure frequency of 7 days per week used in this HHRA likely results in estimated risks that are greater than actual risks for non-subsistence consumption of fish and blue crab. Subsistence fishing and crabbing are unlikely to occur at Laguna la Chiva; however, if subsistence populations are consuming locally harvested fish and blue crab from the lagoon, the estimated risks in the HHRA using EPA's fish consumption rate could be underestimated for those populations.

5.5.4 Chemicals 100% Non-Detected in a Matrix

For chemicals that were 100 percent non-detected in surface soil and sediment, the maximum detection limits and reporting limits were compared to the EPA RSLs for residential soil (adjusted to an HI of 0.1). The comparison is provided in **Attachment C-5** and the results are discussed below for each medium:

- **Sediment** – The maximum detection limits of three SVOCs (4,6-dinitro-2-methylphenol, bis(2-chloroethyl)ether, and n-nitroso-di-n-propylamine) exceeded their respective adjusted RSLs. Although the maximum detection limits of these three SVOCs exceed adjusted RSLs, this is expected to have little impact on the overall risk conclusions because detected chemicals from the same analytical groups in sediment were not identified as COPCs. Also, the degree of adjusted RSL exceedances is insignificant and the detection limits of two chemicals (4,6-dinitro-2-methylphenol and bis(2-chloroethyl)ether) did not exceed adjusted RSLs in all samples. Therefore, it is unlikely that these non-detected chemicals would be identified as COCs in the HHRA.
- **Soil** – The maximum detection limits of 4,4'-DDD and 4,4'-DDT were lower than the adjusted RSLs.

TABLE 5-1
Uncertainties In The Human Health Risk Assessment

Category	Methodology	Probable Effect on Site-Related Risk Estimates
DATA EVALUATION		
Chemicals that were 100% non-detected in an exposure medium.	When a chemical was 100% non-detected in an exposure medium, it was assumed to be not present in the medium.	No significant impact
EXPOSURE ASSESSMENT		
Exposure scenarios and pathways	Assumed that the site is developed for residential use in the future.	Overestimates
Fish/blue crab consumption frequency	Assumed 7 fish or blue crab meals from the site per week	Overestimates
Use of maximum detected concentration of 4,4'-DDE as the EPC in surface soil	Receptors are assumed to be exposed to the maximum detected concentration for the entire exposure duration.	Likely overestimates
Modeled fish and crab concentrations	Fish and crab EPCs were modeled from measured sediment concentrations using BSAFs, which are not derived from site-specific data.	May under- or overestimate
TOXICITY ASSESSMENT		
Missing toxicity values	Oral and inhalation non-cancer toxicity values are missing for 4,4'-DDD and 4,4'-DDE	May underestimate
Study selection	Not all toxicity values represent the same degree of certainty. All are subject to change as new evidence becomes available.	Under- or overestimates risks
Toxicity values derived from animal studies	Extrapolation from animal to human toxicity may introduce error because of differences in pharmacokinetics, target organs, and population variability.	Under- or overestimates risks
Toxicity values derived primarily from high doses (whereas most environmental exposures occur at low doses)	This assumes linearity at low doses and tends to have conservative exposure assumptions.	Under- or overestimates risks
RISK CHARACTERIZATION		
Risk from multiple chemicals	Assumes additivity of risks from multiple chemicals; chemical mixtures may actually have synergistic or antagonistic effects.	May under- or overestimate
Combination of several upper-bound assumptions	Various upper-bound exposure and toxicity assumptions are combined.	Overestimates.

SECTION 6

References

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Attachment C-1
RAGS Part D Tables

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age (1)	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soil	Surface Soil (0-2 feet)	Surface Soil (0-2 feet)	Recreational User/ Trespasser/ Site Visitor (2)	Adult/Youth/Child	Dermal	On-site	Quant	Recreational Users/Trespassers/Site Visitors may contact surface soil while visiting the site.
						Ingestion	On-site	Quant	
		Ambient Air	Emissions from Surface Soil	Recreational User/ Trespasser/ Site Visitor (2)	Adult/Youth/Child	Inhalation	On-site	Quant	Recreational Users/Trespassers/Site Visitors may inhale dust from surface soil while visiting the site.
	Sediment	Sediment	Sediment	Recreational User/ Trespasser/ Site Visitor (2)	Adult/Youth/Child	Dermal	On-site	Quant	Recreational Users/Trespassers may contact sediment while wading in the lagoon.
						Ingestion	On-site	Quant	
	Surface Water	Surface Water	Surface Water	Recreational User/ Trespasser/ Site Visitor (2)	Adult/Youth/Child	Dermal	On-site	None (3)	Recreational Users/Trespassers may contact surface water while wading in the lagoon.
						Ingestion	On-site	None (3)	
	Sediment/ Surface Water	Fish	Lagoon	Fish Consumer	Adult/Youth/Child	Ingestion	On-site	Quant	Fish consumers could be exposed to site contaminants bioaccumulated in fish caught in the lagoon.
		Blue Crab	Lagoon	Blue Crab Consumer	Adult/Youth/Child	Ingestion	On-site	Quant	Crab consumers could be exposed to site contaminants bioaccumulated in blue crab caught in the lagoon.
Future	Soil	Surface Soil (0-2 feet)	Surface Soil (0-2 feet)	Residential	Adult/Child	Dermal	On-site	Quant	The site will not be developed for residential use; however, the residential scenario is included to evaluate unrestricted land use.
						Ingestion	On-site	Quant	
				Maintenance Worker	Adult	Dermal	On-site	Quant	Based on likely occupational duties, it is assumed that maintenance workers may come in contact with surface soil.
						Ingestion	On-site	Quant	
				Industrial Worker	Adult	Dermal	On-site	Quant	The site will not be developed for industrial use; however, Industrial workers were assumed to contact soil while performing occupational duties at the site.
						Ingestion	On-site	Quant	
				Construction Worker	Adult	Dermal	On-site	Quant	Construction workers may contact soil while performing activities at the site.
						Ingestion	On-site	Quant	
		Ambient Air	Emissions from Surface Soil	Residential	Adult/Child	Inhalation	On-site	Quant	The site will not be developed for residential use; however, the residential scenario is included to evaluate unrestricted land use.
				Maintenance Worker	Adult	Inhalation	On-site	Quant	Based on likely occupational duties, it is assumed that maintenance workers may inhale dust from surface soil.
				Industrial Worker	Adult	Inhalation	On-site	Quant	The site will not be developed for industrial use; however, Industrial workers were assumed to inhale dust from soil.
				Construction Worker	Adult	Inhalation	On-site	Quant	Construction workers may inhale dust from soil while performing activities at the site.

Notes:
(1) The age group for a child is 1-6 and the age group for youth is 6-16 years old.
(2) Recreational user scenario is used as an adequate representation of the trespasser and site visitor scenarios.
(3) No evaluation of surface water is included due to the lack of surface water data.
Quant: Quantitative

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future (Recreational User/Trespasser/Site Visitor), Future (Residential)
Medium: Soil
Exposure Medium: Surface Soil (0-2 feet)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Surface Soil (0 - 2 feet)	72-55-9	4,4'-DDE	2.30E+00	2.30E+00	mg/kg	VENO-SO05	1 / 7	0.13 - 0.21	2.30E+00	3.99E+00	1.40E+00	c	NA	NA	Yes	ASL

(1) Maximum concentration is used for screening.

(2) The maximum pesticide concentration found at other Vieques sites (namely, AOC-H).
The value represents the concentration considered attributable to normal pesticide application.

(3) Regional Screening Levels for Residential Soil (November 2013). Concentrations based on non-carcinogenic health effects are adjusted using an HQ=0.1.

(4) Rationale Code Selection Reason: Above Screening Levels (ASL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered

c = Carcinogenic
HQ = Hazard quotient
NA = Not available

TABLE 2.1a
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Future (Maintenance Worker/Industrial Worker/Construction Worker)
Medium: Soil
Exposure Medium: Surface Soil (0-2 feet)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Surface Soil (0 - 2 feet)	72-55-9	4,4'-DDE	2.30E+00	2.30E+00	mg/kg	VENO-SO05	1 / 7	0.13 - 0.21	2.30E+00	3.99E+00	5.10E+00	c	NA	NA	No	BSL

(1) Maximum concentration is used for screening.

(2) The maximum pesticide concentration found at other Vieques sites (namely, AOC-H).
The value represents the concentration considered attributable to normal pesticide application.

(3) Regional Screening Levels for Industrial Soil (November 2013). Concentrations based on non-carcinogenic health effects are adjusted using an HQ=0.1.

(4) Rationale Code Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered

c = Carcinogenic
HQ = Hazard quotient
NA = Not available

TABLE 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future (Recreational User/Trespasser/Site Visitor)
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier		Maximum Concentration Qualifier		Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (1)	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Sediment	72-54-8	4,4'-DDD	2.60E-03	J	1.40E-01	J	MG/KG	VENO-SD01	7 / 14	0.0021 - 0.0063	1.40E-01	NA	2.00E+00	c	NA	NA	No	BSL
	72-55-9	4,4'-DDE	1.50E-03	J	4.10E-02	J	MG/KG	VENO-SD01	8 / 14	0.0026 - 0.0063	4.10E-02	NA	1.40E+00	c	NA	NA	No	BSL
	50-29-3	4,4'-DDT	3.70E-03	J	2.10E-01	J	MG/KG	VENO-SD01	5 / 14	0.0021 - 0.0084	2.10E-01	NA	1.70E+00	c	NA	NA	No	BSL
	78-93-3	2-Butanone	4.90E-03	J	4.80E-02	J	MG/KG	VENO-SD02	13 / 14	0.0033 - 0.0033	4.80E-02	NA	2.80E+03	n	NA	NA	No	BSL
	67-64-1	Acetone	8.10E-03	J	1.40E-01	J	MG/KG	VENO-SD02	14 / 14	-	1.40E-01	NA	6.10E+03	n	NA	NA	No	BSL
	75-25-2	Bromoform	7.00E-04	J	7.00E-04	J	MG/KG	VENO-SD10	1 / 14	0.0012 - 0.0058	7.00E-04	NA	6.20E+01	c	NA	NA	No	BSL
	75-15-0	Carbon disulfide	4.80E-03	J	8.50E-02	J	MG/KG	VENO-SD04	9 / 14	0.0082 - 0.013	8.50E-02	NA	8.20E+01	n	NA	NA	No	BSL

(1) Maximum concentration is used for screening.

(2) No background value is available.
sediment data collected from three nearby lagoons (Laguna Kiani, Laguna El Pobre, and Laguna Punta Arenas).

(3) Regional Screening Levels for Residential Soil (November 2013). Concentrations based on non-carcinogenic health effects are adjusted using an HQ=0.1.

(4) Rationale Code Deletion Reason: Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
c = Carcinogenic
n = Noncarcinogenic
HQ = Hazard quotient
NA = Not available
J = analyte was detected below the reporting limit in the sample

TABLE 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future (Fish Consumer/Blue Crab Consumer)
Medium: Sediment
Exposure Medium: Fish/Blue Crab

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier		Maximum Concentration Qualifier		Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Background Value (1)	Screening Toxicity Value (2)	Bioaccumulative (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Lagoon	72-54-8	4,4'-DDD	2.60E-03	J	1.50E-01	J	MG/KG	VENO-SD06	8 / 12	0.0038 - 0.0058	NA	6.02E+00	Yes	NA	NA	Yes	BAC
	72-55-9	4,4'-DDE	1.40E-02	J	2.00E-02	J	MG/KG	VENO-SD04	6 / 12	0.0026 - 0.0072	NA	6.51E+00	Yes	NA	NA	Yes	BAC
	50-29-3	4,4'-DDT	3.70E-03	J	5.40E-02	J	MG/KG	VENO-SD03	4 / 12	0.0026 - 0.0084	NA	6.91E+00	Yes	NA	NA	Yes	BAC
	78-93-3	2-Butanone	4.90E-03	J	5.60E-02	J	MG/KG	VENO-SD06	11 / 12	0.0033 - 0.0033	NA	2.90E-01	No	NA	NA	No	NBAC
	67-64-1	Acetone	8.10E-03	J	2.40E-01	J	MG/KG	VENO-SD06	12 / 12	-	NA	-2.40E-01	No	NA	NA	No	NBAC
	75-25-2	Bromoform	7.00E-04	J	7.00E-04	J	MG/KG	VENO-SD10	1 / 12	0.0013 - 0.0058	NA	2.40E+00	No	NA	NA	No	NBAC
	75-15-0	Carbon disulfide	4.80E-03	J	5.10E-02	J	MG/KG	VENO-SD04	9 / 12	0.0091 - 0.013	NA	1.94E+00	No	NA	NA	No	NBAC

(1) No background value is available.
sediment data collected from three nearby lagoons (Laguna Kiani, Laguna El Pobre, and Laguna Punta Arenas).

(2) Log Kow values (Estimation Program Interface [EPI] Suite, 2013. Risk Assessment Information System.). Available online: http://rais.ornl.gov/cgi-bin/tools/TOX_search

(3) Organic chemicals considered bioaccumulative if Log Kow exceeded 3 according to EPA's Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment - Status and Needs (EPA, 2000).

(4) Rationale Codes
Selection Reason: Bioaccumulative (BAC)
Deletion Reason: Not Bioaccumulative (NBAC)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
NA = Not available or not applicable
J = analyte was detected below the reporting limit in the sample

TABLE 3.1.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future (Recreational User/Trespasser/Site Visitor), Future (Residential)
Medium: Soil
Exposure Medium: Surface Soil (0-2 feet)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Surface Soil (0 - 2 feet)	4,4'-DDE	mg/kg	NA	NA	2.3E+00	2.3E+00	mg/kg	Maximum Detected Concentration	(1)

(1) The maximum detected concentration was used for this chemical because there were less than 8 total samples.

mg/kg= milligrams/kilograms
NA = Not applicable

TABLE 3.1.RME Supplement A
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future (Recreational User/Trespasser/Site Visitor), Future (Residential)
Medium: Soil
Exposure Medium: Ambient Air

Exposure Point	Chemical of Potential Concern	Exposure Point Concentration in Soil		Exposure Point Concentration in Ambient Air	
		Value (1)	Units	Value (2)	Units
Surface Soil (0 - 2 feet)	4,4'-DDE	2.3E+00	mg/kg	3.5E-09	mg/m^3

(1) Selection of exposure point concentrations presented on Table 3.1.RME.

(2) Ambient air exposure point concentration calculated using a Particulate Emission Factor (PEF) of 6.50×10^8 m^3/kg as shown below; derivation of PEF is presented on Table 4 RME Supplement A.

Concentration in ambient air (mg/m^3) = Concentration in soil (mg/kg) x [1/PEF (m^3/kg)]

mg/kg= milligrams/kilogram

mg/m^3 = milligram per cubic meter

TABLE 3.2.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future (Fish Consumer/Blue Crab Consumer)
Medium: Sediment
Exposure Medium: Fish/Blue Crab

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration (Qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Lagoon	4,4'-DDD	mg/kg	3.4E-02	4.8E-02	1.5E-01	J	4.8E-02	mg/kg	95% KM (BCA) UCL	(1)
	4,4'-DDE	mg/kg	1.6E-02	1.6E-02	2.0E-02	J	1.6E-02	mg/kg	95% KM (t) UCL	(1)
	4,4'-DDT	mg/kg	1.8E-02	1.7E-02	5.4E-02	J	1.7E-02	mg/kg	95% KM (t) UCL	(1)

ProUCL, Version 4.1.01 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide (EPA. February 2011. ProUCL, Version 4.1.01. Prepared by Lockheed Martin Environmental Services).

Statistics: Maximum Detected Value (Max); 95% KM (t) UCL; 95% KM (z) UCL; 95% KM (jackknife) UCL; 99% KM (Chebyshev) UCL; 97.5% KM (Chebyshev) UCL; 95% KM (Chebyshev) UCL; 99% Chebyshev (MVUE) UCL 95% KM (bootstrap t) UCL; 95% Student's-T test UCL (95% Stud-t); 95% KM (BCA) UCL; 95% H-UCL; 95% Chebyshev (MVUE) UCL; 95% KM (Percentile Bootstrap) UCL; 95% Approximate Gamma (App. Gamma); 95% Adjusted Gamma (Adj. Gamma); 95% Chebyshev (Mean, Sd) UCL (95% Cheb-m)

(1) Distribution tests are inconclusive (data are not normal, log-normal, or gamma-distributed).

mg/kg= milligrams/kilograms
J = analyte was detected below the reporting limit in the sample

TABLE 3.2.RME Supplement A
BIOTA-TO-SEDIMENT ACCUMULATION FACTORS FOR COPCS IN SEDIMENT
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

					Fish					Crab				
CAS Number	COPC (1)	Log K_{ow}	Log Kow Reference	Sediment EPC (2) (mg/kg-sediment)	BSAF Value Unitless	Organism Used for Deriving BSAF	Tissue Used for Deriving BSAF	BSAF Reference	Fish EPC (3) (mg/kg-biota)	BSAF Value Unitless	Organism Used for Deriving BSAF	Tissue Used for Deriving BSAF	BSAF Reference	Crab EPC (3) (mg/kg-biota)
72-54-8	4,4'-DDD	6.0E+00	EPI, 2013	4.8E-02	2.5E-01	Cunner (Tautogolabrus adspersus)	Whole body	EPA, 2008	3.3E-03	3.0E+00	Burrowing Crab (Chasmagnathus granulata)	Whole body	USACE, 2009	2.9E-02
72-55-9	4,4'-DDE	6.5E+00	EPI, 2013	1.6E-02	1.4E+01	Average of consumed salt water species	Whole body	EPA, 2008	6.4E-02	3.2E+01	Burrowing Crab (Chasmagnathus granulata)	Whole body	USACE, 2009	1.1E-01
50-29-3	4,4'-DDT	6.9E+00	EPI, 2013	1.7E-02	2.3E-01	Cunner (Tautogolabrus adspersus)	Whole body	EPA, 2008	1.1E-03	2.2E+00	Burrowing Crab (Chasmagnathus granulata)	Whole body	USACE, 2009	7.6E-03

Notes:
(1) COPCs identified for sediment are presented in Table 2.3.
(2) Sediment EPCs are presented in Table 3.2.
(3) Fish/Crab EPCs were calculated using the following equations:

Organics: Fish/Crab EPC (mg/kg-biota [ww]) = Sed EPC (mg/kg-sed [dw]) x lipid normalized BSAF (kg-OC [dw]/kg-lipid [dw]) x (%lipid / %OC) x 0.25 (kg-biota [dw]/kg-biota [ww]).
Fish/Crab EPCs were calculated assuming 4.6% organic carbon (site-specific; Table 3.2 Supplement B) in sediment and 5% lipid for fish (EPA, 2000), 3.8% lipid for crab (USACE, 2009), and 75% moisture in fish/crab (EPA, 1993).

COPC - chemical of potential concern
EPC - exposure point concentration
BSAF - biota-sediment accumulation factor
OC - organic carbon
K_{ow} - octanol/water partition coefficient

EPI - Estimation Program Interface
USACE - United States Army Corps of Engineers

dw - dry weight basis
ww -wet weight basis

Sources:

EPA, 1993. Wildlife exposure factors handbook. Volume I of II. EPA/600/R-93/187a

EPA, 2000. Bioaccumulation testing and interpretation for the purpose of sediment quality assessment - status and needs. EPA/823/R-00/001.

EPA, 2008. Biota-Sediment Accumulation Factor Data Set, Version 1.0. Prepared for the U.S. Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Mid-Continent Ecology Division (MED), Duluth, Minnesota. Prepared Computer Sciences Corporation Duluth, Minnesota Contract 68 W-02 032, Task 5003 and 5004. January 2008. http://www.epa.gov/med/Prods_Pubs/bsaf.htm
Estimation Program Interface (EPI) Suite, 2013. Risk Assessment Information System. URL: http://rais.ornl.gov/cgi-bin/tools/TOX_search
United States Army Corps of Engineers (USACE), 2009. BSAF Database. Available online: http://el.erdc.usace.army.mil/bsafnew/bsaf.html

TABLE 3.2.RME Supplement B
CALCULATION OF SITE-SPECIFIC TOC FRACTION
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

StationID	SampleID	Upper Depth (feet)	Lower Depth (feet)	Date Collected	Analyte	Results
VENO-SD01	VENO-SD01-000H	0	0.5	5/15/2013	Total organic carbon (TOC)	32000
VENO-SD02	VENO-SD02-000H	0	0.5	5/15/2013	Total organic carbon (TOC)	48000
VENO-SD03	VENO-SD03-000H	0	0.5	5/15/2013	Total organic carbon (TOC)	47000
VENO-SD04	VENO-SD04-000H	0	0.5	5/17/2013	Total organic carbon (TOC)	100000
VENO-SD05	VENO-SD05-000H	0	0.5	5/17/2013	Total organic carbon (TOC)	47000
VENO-SD06	VENO-SD06-000H	0	0.5	5/17/2013	Total organic carbon (TOC)	38000
VENO-SD07	VENO-SD07-000H	0	0.5	5/17/2013	Total organic carbon (TOC)	4500
VENO-SD08	VENO-SD08-000H	0	0.5	5/16/2013	Total organic carbon (TOC)	70000
VENO-SD09	VENO-SD09-000H	0	0.5	5/16/2013	Total organic carbon (TOC)	44000
VENO-SD10	VENO-SD10-000H	0	0.5	5/16/2013	Total organic carbon (TOC)	26000
VENO-SD11	VENO-SD11-000H	0	0.5	5/16/2013	Total organic carbon (TOC)	36000
VENO-SD12	VENO-SD12-000H	0	0.5	5/15/2013	Total organic carbon (TOC)	55000

Note:
Units are presented in mg/kg.
Site-specific TOC percentage is the average.

Average Total Organic Carbon (TOC) % = 4.6%

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil (0-2 feet)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational User/ Trespasser/ Site Visitor	Adult	Surface Soil (0 - 2 feet)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
		Youth	Surface Soil (0 - 2 feet)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	10	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	39	kg	EPA 2004 (2)	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
		Child	Surface Soil (0 - 2 feet)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	200	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
Dermal	Recreational User/ Trespasser/ Site Visitor	Adult	Surface Soil (0 - 2 feet)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,700	cm^2	EPA, 2004 (5)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical-Specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil (0-2 feet)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont.)	Recreational User/ Trespasser/ Site Visitor (cont.)	Youth	Surface Soil (0 - 2 feet)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	4,100	cm^2	EPA, 2004 (5)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical-Specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	10	years	EPA, 1991	
				BW	Body Weight	39	kg	EPA 2004 (2)	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
		Child	Surface Soil (0 - 2 feet)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	2,800	cm^2	EPA, 2004 (6)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical-Specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	

Notes:
(1) Based on best professional judgment.
(2) Youths from 6 to 16 years of age. Body weight is average of the mean values for boys and girls for the ages 6 through 16.
(3) Calculated as the product of ED (years) x 365 days/year.
(4) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.
(5) SA includes head, hands, forearms, and lower legs.
(6) SA includes head, hands, forearms, lower legs, and feet.

Sources:
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.
EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.

cm^2 = Square centimeter
kg = Kilogram
kg/mg = Kilogram per milligram
mg/kg = Milligram per kilogram
mg/kg-day = Milligram per kilogram per day
mg/cm^2-day = Milligram per square centimeter per day
mg/day = Milligram per day

TABLE 4.2.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Ambient Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Recreational User/ Trespasser/ Site Visitor	Adult	Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	Exposure Concentration (EC) (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	6.50E+08	m^3/kg	see Table 4 Supp A	
				ET	Exposure Time	4	hr/day	(1)	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	
				CF	Conversion Factor	1/24	day/hr	- -	
		Youth	Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	6.50E+08	m^3/kg	see Table 4 Supp A	
				ET	Exposure Time	4	hr/day	(1)	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	10	years	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	
				CF	Conversion Factor	1/24	day/hr	- -	
		Child	Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	6.50E+08	m^3/kg	see Table 4 Supp A	
				ET	Exposure Time	4	hr/day	(1)	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(2)	
				AT-C	Averaging Time (Cancer)	25,550	days	(3)	
				CF	Conversion Factor	1/24	day/hr	- -	

Notes:
(1) Based on best professional judgment.
(2) Calculated as the product of ED (years) x 365 days/year.
(3) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.

Sources:
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

mg/kg = Milligram per kilogram
mg/m^3 = Milligram per cubic meter
m^3/kg = Cubic meter per kilogram

TABLE 4.3.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Fish/Blue Crab

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Fish/Blue Crab Consumer	Adult	Lagoon	C-SED	Chemical Concentration in Sediment	See Table 3s.RME	mg/kg-sed	See Table 3s.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				C-CF	Chemical Concentration in Fish or Blue Crab	calculated	mg/kg-tissue	calculated	C-CF x IR-FC x EF x ED x CF x 1/BW x 1/AT
				BSAF-O	Biota-to-sediment accumulation factor for organic chemicals	chemical specific	kg-OC (dw)/kg-lipid (dw)	chemical-specific	
				OC	Percent Organic Carbon in Sediment	4.6	percent	see Table 3.2 Supp B	Organic Chemicals:
				LI	Percent Lipid in Fish/Crab	5 / 3.8	percent	EPA, 2002	C-CF = C-SED x BSAF-O x MC x (LI / OC)
				MC	Moisture Content	0.75	kg-tissue (dw)/kg-tissue (ww)	EPA, 1993	
				IR-FC	Fish/Crab Ingestion Rate	0.227	kg-tissue/meal	EPA, 2000 (1)	
				EF	Exposure Frequency	7	meals/week	Burger and Gochfeld, 1991 (2)	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF	Conversion Factor	52	weeks/year	- -	
		Youth	Lagoon	C-SED	Chemical Concentration in Sediment	See Table 3s.RME	mg/kg-sed	See Table 3s.RME	CDI (mg/kg-day) =
				C-CF	Chemical Concentration in Fish or Blue Crab	calculated	mg/kg-tissue	calculated	C-CF x IR-FC x EF x ED x CF x 1/BW x 1/AT
				BSAF-O	Biota-to-sediment accumulation factor for organic chemicals	chemical specific	kg-OC (dw)/kg-lipid (dw)	chemical-specific	
				OC	Percent Organic Carbon in Sediment	4.6	percent	see Table 3.2 Supp B	Organic Chemicals:
				LI	Percent Lipid in Fish/Crab	5 / 3.8	percent	EPA, 2002	C-CF = C-SED x BSAF-O x MC x (LI / OC)
				MC	Moisture Content	0.75	kg-tissue (dw)/kg-tissue (ww)	EPA, 1993	
				IR-FC	Fish/Crab Ingestion Rate	0.227	kg-tissue/meal	EPA, 2000 (1)	
				EF	Exposure Frequency	7	meals/week	Burger and Gochfeld, 1991 (2)	
				ED	Exposure Duration	10	years	EPA, 1991	
				BW	Body Weight	39	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF	Conversion Factor	52	weeks/year	- -	
		Child	Lagoon	C-SED	Chemical Concentration in Sediment	See Table 3s.RME	mg/kg-sed	See Table 3s.RME	CDI (mg/kg-day) =
				C-CF	Chemical Concentration in Fish or Blue Crab	calculated	mg/kg-tissue	calculated	C-CF x IR-FC x EF x ED x CF x 1/BW x 1/AT
				BSAF-O	Biota-to-sediment accumulation factor for organic chemicals	chemical specific	kg-OC (dw)/kg-lipid (dw)	chemical-specific	
				OC	Percent Organic Carbon in Sediment	4.6	percent	see Table 3.2 Supp B	Organic Chemicals:
				LI	Percent Lipid in Fish/Crab	5 / 3.8	percent	EPA, 2002	C-CF = C-SED x BSAF-O x MC x (LI / OC)
				MC	Moisture Content	0.75	kg-tissue (dw)/kg-tissue (ww)	EPA, 1993	
				IR-FC	Fish/Crab Ingestion Rate	0.114	kg-tissue/meal	(5)	
				EF	Exposure Frequency	7	meals/week	Burger and Gochfeld, 1991 (2)	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	(4)	
				CF	Conversion Factor	52	weeks/year	- -	

Notes:
(1) EPA's default fish/shellfish meal size of 8 oz for the general adult population.
(2) Average fish consumption rate in Puerto Rico, adapted from the study in the city of Humacao.
(3) Calculated as the product of ED (years) x 365 days/year.
(4) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.
(5) One half the adult fish/blue crab meal size of 8 oz.

Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA. 1993. Wildlife exposure factors handbook. Volume I of II. EPA/600/R-93/187a
EPA, 2000: Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories. Volume 2 Risk Assessment and Fish Consumption Limits Third Edition. Office of Water.
Burger and Gochfeld. 1991. Fishing a Superfund Site: Dissonance and Risk Perception of Environmental Hazards by Fishermen in Puerto Rico. Risk Analysis. 11 (2). 269-277.

kg = Kilogram
mg/kg = Milligram per kilogram
mg/kg-day = Milligram per kilogram per day
ww = wet weight
dw = dry weight

TABLE 4.4.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface Soil (0-2 feet)

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residential	Adult	Surface Soil (0 - 2 feet)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	24	years	EPA, 2002	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(1)	
		Child	Surface Soil (0 - 2 feet)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	200	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	6	years	EPA, 2002	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
		Child/Adult Aggregate	Surface Soil (0 - 2 feet)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				IR-S-Adj	Ingestion Rate of Soil, Age-adjusted	114.29	mg-year/kg-day	Calculated	CS x IR-S-Adj x EF x CF x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 2002	IR-S-Adj (mg-year/kg-day) =
				CF	Conversion Factor	0.000001	kg/mg	- -	(ED-C x IR-S-C / BW-C) + (ED-A x IR-S-A / BW-A)
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
Dermal	Residential	Adult	Surface Soil (0 - 2 feet)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,700	cm^2	EPA, 2004 (3)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical-Specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	24	years	EPA, 2002	
				BW	Body Weight	70	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(1)	
		Child	Surface Soil (0 - 2 feet)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	2,800	cm^2	EPA, 2004 (4)	CS x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2004	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical-Specific	--	EPA, 2004	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	6	years	EPA, 2002	
				BW	Body Weight	15	kg	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
		Child/Adult Aggregate	Surface Soil (0 - 2 feet)	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	CDI (mg/kg-day) =
				DA-Adj	Dermal Absorption, Age-adjusted	361	mg-year/kg-day	Calculated	CS x DA-Adj x DABS x CF x EF x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical-Specific	--	EPA, 2002	DA-Adj (mg-year/kg-day) =
				CF	Conversion Factor	0.000001	kg/mg	- -	(ED-C x SA-C x SSAF-C / BW-C) + (ED-A x SA-A x SSAF-A / BW-A)
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	

Notes:
(1) Calculated as the product of ED (years) x 365 days/year.
(2) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.
(3) SA includes head, hands, forearms, and lower legs.
(4) SA includes head, hands, forearms, lower legs, and feet.

Sources:
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.
EPA, 2004: Risk Assessment Guidance for Superfund (RAGS) Volume I: Human Health Evaluation Manual. Part E Supplemental Guidance for Dermal Risk Assessment) Final.

cm^2 = Square centimeter
kg = Kilogram
kg/mg = Kilogram per milligram
mg/kg = Milligram per kilogram
mg/kg-day = Milligram per kilogram per day
mg/cm^2-day = Milligram per square centimeter per day
mg/day = Milligram per day

TABLE 4.5.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Ambient Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Residential	Adult	Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	Exposure Concentration (EC) (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	6.50E+08	m^3/kg	see Table 4 Supp A	
				ET	Exposure Time	24	hr/day	EPA, 2011	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	24	years	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	(1)	
				CF	Conversion Factor	1/24	day/hr	- -	
		Child	Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	6.50E+08	m^3/kg	see Table 4 Supp A	
				ET	Exposure Time	24	hr/day	EPA, 2011	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	6	years	EPA, 2002	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	(1)	
				CF	Conversion Factor	1/24	day/hr	- -	
		Child/Adult Aggregate	Emissions from Surface Soil	CS	Chemical Concentration in Soil	See Table 3s.RME	mg/kg	See Table 3s.RME	EC (mg/m^3) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	Calculated	CA x ET x EF x ED x CF x 1/AT
				PEF	Particulate Emission Factor	6.50E+08	m^3/kg	see Table 4 Supp A	
				ET	Exposure Time	24	hr/day	EPA, 2011	CA (mg/m^3) = CS (1/PEF)
				EF	Exposure Frequency	350	days/year	EPA, 2002	
				ED	Exposure Duration	30	years	EPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	(2)	
				CF	Conversion Factor	1/24	day/hr	- -	

Notes:
(1) Calculated as the product of ED (years) x 365 days/year.
(2) Calculated as the product of 70 years assumed human lifetime (EPA, 1989) x 365 days/year.

Sources:
EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.
EPA, 2013: Regional Screening Levels for Chemical Contaminants at Superfund Sites. May.

mg/kg = Milligram per kilogram
mg/m^3 = Milligram per cubic meter
m^3/kg = Cubic meter per kilogram

TABLE 4 RME Supplement A
Particulate Emission Factor - Recreational User/Trespasser/Site Visitor and Resident
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

PEF Equations:

$$Q/C_{wind} = A \times \exp\left[\frac{(\ln A_{site} - B)^2}{C}\right]$$

Exhibit D-2 (EPA, 2002)

$$PEF = Q/C_{wind} \times \frac{3{,}600 \sec/\mathrm{hr}}{0.036 \times (1-V) \times \left(U_m/U_t\right)^3 \times F(x)}$$

Equation 4-5 (EPA, 2002)

PEF and Box Model Input Parameters

Parameter	Definition	Value	Units	Source
Q/C_{wind}	inverse ratio of the geometric mean air concentration to the emission flux at the center of a square source	**61**	m	calculated
A	Constant for Zone 9 (Miami, FL)	12.196	unitless	Exhibit D-2 (EPA, 2002)
B	Constant for Zone 9 (Miami, FL)	19.065	unitless	Exhibit D-2 (EPA, 2002)
C	Constant for Zone 9 (Miami, FL)	215.392	unitless	Exhibit D-2 (EPA, 2002)
A_{site}	Areal extent of site contamination	1.6	acres	site-specific
PEF	particulate emission factor	**6.50E+08**	m^3/kg	calculated
V	fraction of vegetative cover	0.5	unitless	Default (Eqn. 4-5)
Um	mean annual windspeed	5.19	m/s	Note 1 (Dept. of Navy, 1979)
Ut	equivalent threshold value of windspeed at 7 m	11.32	m/s	Default (Eqn. 4-5)
F(x)	function dependent on Um/Ut derived using Cowherd et al. (1985)	0.194	unitless	Default (Eqn. 4-5)

Source:
Note 1 - The daily average windspeed from measurements at Observation Post 5 on Vieques (10.1 knots = 5.19 m/s) was used.

Department of the Navy. 1979. Draft Environmental Impact Statement: Volume I – Continued Use of the Atlantic Fleet Weapons Training Facility Inner Range (Vieques). December.
EPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, EPA Office of Solid Waste and Emergency Response. OSWER 9355.4-24. December.

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
4,4'-DDD	Chronic	NA	NA	(1)	(1)	--	NA	NA	NA	NA
4,4'-DDE	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	Chronic	5.0E-04	mg/kg-day	(1)	(1)	--	Liver	100 / 1	IRIS	9/16/2013

Note:
(1) Dermal exposure pathway is not applicable for this COPC.

Definitions:
IRIS = Integrated Risk Information System
NA = Not Available

TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
4,4'-DDE	Chronic	NA	NA	NA	NA	NA	NA

Definitions:

NA = Not Available

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal (2)		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
4,4'-DDD	2.4E-01	$(mg/kg\text{-}day)^{-1}$	(3)	(3)	--	B2	IRIS	9/16/2013
4,4'-DDE	3.4E-01	$(mg/kg\text{-}day)^{-1}$	> 50%	3.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	9/16/2013
4,4'-DDT	3.4E-01	$(mg/kg\text{-}day)^{-1}$	(3)	(3)	--	B2	IRIS	9/16/2013

Note:
(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. Section 4.2 and Exhibit 4-1. USEPA recommends that the oral slope factor should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.
(2) Adjusted based on RAGS Part E.
(3) Dermal exposure pathway is not applicable for this COPC.

Definitions:
IRIS = Integrated Risk Information System
NA = Not Available

Weight of Evidence definitions:
Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Chemical of Potential Concern	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
4,4'-DDE	9.7E-05	$(ug/m^3)^{-1}$	B2	Cal/EPA (1)	8/9/2012

Note:
(1) Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (USEPA, May 2013).

Definitions:
CalEPA = California EPA
NA = Not Available

Weight of Evidence definitions:
Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.

Table 7.1 RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 -2 feet)	Surface Soil (0 -2 feet)	Ingestion	4,4'-DDE	2.3E+00	mg/kg	3.2E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.1E-07	9.4E-07	mg/kg-day	NA	NA	NA
			Exp. Route Total								1.1E-07					0.0E+00
Soil	Surface Soil (0 -2 feet)	Surface Soil (0 -2 feet)	Dermal	4,4'-DDE	2.3E+00	mg/kg	3.7E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.2E-07	1.1E-06	mg/kg-day	NA	NA	NA
			Exp. Route Total								1.2E-07					0.0E+00
		Exposure Point Total									2.3E-07					0.0E+00
	Exposure Medium Total										2.3E-07					0.0E+00
Soil	Ambient Air	Emissions from Surface Soil	Inhalation	4,4'-DDE	3.5E-09	mg/m^3	5.8E-11	mg/m^3	9.7E-05	$1/(ug/m^3)$	5.6E-12	1.7E-10	mg/m^3	NA	NA	NA
			Exp. Route Total								5.6E-12					0.0E+00
		Exposure Point Total									5.6E-12					0.0E+00
	Exposure Medium Total										5.6E-12					0.0E+00
Soil Total											2.3E-07					0.0E+00
Receptor Total											2.3E-07					0.0E+00

Table 7.2 RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 -2 feet)	Surface Soil (0 -2 feet)	Ingestion	4,4'-DDE	2.3E+00	mg/kg	2.4E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	8.2E-08	1.7E-06	mg/kg-day	NA	NA	NA
			Exp. Route Total								8.2E-08					0.0E+00
Soil	Surface Soil (0 -2 feet)	Surface Soil (0 -2 feet)	Dermal	4,4'-DDE	2.3E+00	mg/kg	2.0E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	6.7E-08	1.4E-06	mg/kg-day	NA	NA	NA
			Exp. Route Total								6.7E-08					0.0E+00
		Exposure Point Total									1.5E-07					0.0E+00
	Exposure Medium Total										1.5E-07					0.0E+00
Soil	Ambient Air	Emissions from Surface Soil	Inhalation	4,4'-DDE	3.5E-09	mg/m^3	2.4E-11	mg/m^3	9.7E-05	$1/(ug/m^3)$	2.3E-12	1.7E-10	mg/m^3	NA	NA	NA
			Exp. Route Total								2.3E-12					0.0E+00
		Exposure Point Total									2.3E-12					0.0E+00
	Exposure Medium Total										2.3E-12					0.0E+00
Soil Total											1.5E-07					0.0E+00
Receptor Total											1.5E-07					0.0E+00

Table 7.3 RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 -2 feet)	Surface Soil (0 -2 feet)	Ingestion	4,4'-DDE	2.3E+00	mg/kg	7.5E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.5E-07	8.7E-06	mg/kg-day	NA	NA	NA
			Exp. Route Total								2.5E-07					0.0E+00
Soil	Surface Soil (0 -2 feet)	Surface Soil (0 -2 feet)	Dermal	4,4'-DDE	2.3E+00	mg/kg	2.1E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	7.1E-08	2.4E-06	mg/kg-day	NA	NA	NA
			Exp. Route Total								7.1E-08					0.0E+00
		Exposure Point Total									3.3E-07					0.0E+00
	Exposure Medium Total										3.3E-07					0.0E+00
Soil	Ambient Air	Emissions from Surface Soil	Inhalation	4,4'-DDE	3.5E-09	mg/m^3	1.4E-11	mg/m^3	9.7E-05	$1/(ug/m^3)$	1.4E-12	1.7E-10	mg/m^3	NA	NA	NA
			Exp. Route Total								1.4E-12					0.0E+00
		Exposure Point Total									1.4E-12					0.0E+00
	Exposure Medium Total										1.4E-12					0.0E+00
Soil Total											3.3E-07					0.0E+00
Receptor Total											3.3E-07					0.0E+00

Table 7.4 RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Fish	Lagoon	Ingestion	4,4'-DDD	3.3E-03	mg/kg	3.7E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	8.8E-07	1.1E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	6.4E-02	mg/kg	7.0E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.4E-05	2.1E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	1.1E-03	mg/kg	1.2E-06	mg/kg-day	3.4E-01	1/(mg/kg-day)	4.0E-07	3.4E-06	mg/kg-day	5.0E-04	mg/kg-day	6.8E-03
			Exp. Route Total								2.5E-05					6.8E-03
		Exposure Point Total									2.5E-05					6.8E-03
	Exposure Medium Total										2.5E-05					6.8E-03
Fish Total											2.5E-05					6.8E-03
Receptor Total											2.5E-05					6.8E-03

Table 7.5 RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Fish	Lagoon	Ingestion	4,4'-DDD	3.3E-03	mg/kg	2.7E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	6.6E-07	1.9E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	6.4E-02	mg/kg	5.3E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.8E-05	3.7E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	1.1E-03	mg/kg	8.7E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	3.0E-07	6.1E-06	mg/kg-day	5.0E-04	mg/kg-day	1.2E-02
			Exp. Route Total								1.9E-05					1.2E-02
		Exposure Point Total									1.9E-05					1.2E-02
	Exposure Medium Total										1.9E-05					1.2E-02
Fish Total											1.9E-05					1.2E-02
Receptor Total											1.9E-05					1.2E-02

Table 7.6 RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Fish	Lagoon	Ingestion	4,4'-DDD	3.3E-03	mg/kg	2.1E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	5.1E-07	2.5E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	6.4E-02	mg/kg	4.1E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.4E-05	4.8E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	1.1E-03	mg/kg	6.8E-07	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.3E-07	8.0E-06	mg/kg-day	5.0E-04	mg/kg-day	1.6E-02
			Exp. Route Total								1.5E-05					1.6E-02
		Exposure Point Total									1.5E-05					1.6E-02
	Exposure Medium Total										1.5E-05					1.6E-02
Fish Total											1.5E-05					1.6E-02
Receptor Total											1.5E-05					1.6E-02

Table 7.7 RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Blue Crab Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Blue Crab	Lagoon	Ingestion	4,4'-DDD	2.9E-02	mg/kg	3.3E-05	mg/kg-day	2.4E-01	1/(mg/kg-day)	7.8E-06	9.5E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	1.1E-01	mg/kg	1.2E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	4.2E-05	3.6E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	7.6E-03	mg/kg	8.4E-06	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.9E-06	2.5E-05	mg/kg-day	5.0E-04	mg/kg-day	4.9E-02
			Exp. Route Total								5.3E-05					4.9E-02
		Exposure Point Total									5.3E-05					4.9E-02
	Exposure Medium Total										5.3E-05					4.9E-02
Blue Crab Total											5.3E-05					4.9E-02
Receptor Total											5.3E-05					4.9E-02

Table 7.8 RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Blue Crab Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Blue Crab	Lagoon	Ingestion	4,4'-DDD	2.9E-02	mg/kg	2.4E-05	mg/kg-day	2.4E-01	1/(mg/kg-day)	5.9E-06	1.7E-04	mg/kg-day	NA	NA	NA
				4,4'-DDE	1.1E-01	mg/kg	9.2E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	3.1E-05	6.4E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	7.6E-03	mg/kg	6.3E-06	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.1E-06	4.4E-05	mg/kg-day	5.0E-04	mg/kg-day	8.8E-02
			Exp. Route Total								3.9E-05					8.8E-02
		Exposure Point Total									3.9E-05					8.8E-02
	Exposure Medium Total										3.9E-05					8.8E-02
Blue Crab Total											3.9E-05					8.8E-02
Receptor Total											3.9E-05					8.8E-02

Table 7.9 RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Blue Crab Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Blue Crab	Lagoon	Ingestion	4,4'-DDD	2.9E-02	mg/kg	1.9E-05	mg/kg-day	2.4E-01	1/(mg/kg-day)	4.6E-06	2.2E-04	mg/kg-day	NA	NA	NA
				4,4'-DDE	1.1E-01	mg/kg	7.2E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.5E-05	8.4E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	7.6E-03	mg/kg	4.9E-06	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.7E-06	5.8E-05	mg/kg-day	5.0E-04	mg/kg-day	1.2E-01
			Exp. Route Total								3.1E-05					1.2E-01
		Exposure Point Total									3.1E-05					1.2E-01
	Exposure Medium Total										3.1E-05					1.2E-01
Blue Crab Total											3.1E-05					1.2E-01
Receptor Total											3.1E-05					1.2E-01

Table 7.10 RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 -2 feet)	Surface Soil (0 -2 feet)	Ingestion	4,4'-DDE	2.3E+00	mg/kg	NA	NA	NA	NA	NA	3.2E-06	mg/kg-day	NA	NA	NA
			Exp. Route Total								NA					0.0E+00
Soil	Surface Soil (0 -2 feet)	Surface Soil (0 -2 feet)	Dermal	4,4'-DDE	2.3E+00	mg/kg	NA	NA	NA	NA	NA	1.3E-06	mg/kg-day	NA	NA	NA
			Exp. Route Total								NA					0.0E+00
		Exposure Point Total									NA					0.0E+00
	Exposure Medium Total										NA					0.0E+00
Soil	Ambient Air	Emissions from Surface Soil	Inhalation	4,4'-DDE	3.5E-09	mg/m^3	NA	NA	NA	NA	NA	3.4E-09	mg/m^3	NA	NA	NA
			Exp. Route Total								NA					0.0E+00
		Exposure Point Total									NA					0.0E+00
	Exposure Medium Total										NA					0.0E+00
Soil Total											NA					0.0E+00
Receptor Total											NA					0.0E+00

NA = Not applicable.

Table 7.11 RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 -2 feet)	Surface Soil (0 -2 feet)	Ingestion	4,4'-DDE	2.3E+00	mg/kg	NA	NA	NA	NA	NA	2.9E-05	mg/kg-day	NA	NA	NA
			Exp. Route Total								NA					0.0E+00
Soil	Surface Soil (0 -2 feet)	Surface Soil (0 -2 feet)	Dermal	4,4'-DDE	2.3E+00	mg/kg	NA	NA	NA	NA	NA	8.2E-06	mg/kg-day	NA	NA	NA
			Exp. Route Total								NA					0.0E+00
		Exposure Point Total									NA					0.0E+00
	Exposure Medium Total										NA					0.0E+00
Soil	Ambient Air	Emissions from Surface Soil	Inhalation	4,4'-DDE	3.5E-09	mg/m^3	NA	NA	NA	NA	NA	3.4E-09	mg/m^3	NA	NA	NA
			Exp. Route Total								NA					0.0E+00
		Exposure Point Total									NA					0.0E+00
	Exposure Medium Total										NA					0.0E+00
Soil Total											NA					0.0E+00
Receptor Total											NA					0.0E+00

Table 7.12 RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Surface Soil (0 -2 feet)	Surface Soil (0 -2 feet)	Ingestion	4,4'-DDE	2.3E+00	mg/kg	3.6E-06	mg/kg-day	3.4E-01	1/(mg/kg-day)	1.2E-06	NA	NA	NA	NA	NA
			Exp. Route Total								1.2E-06					0.0E+00
Soil	Surface Soil (0 -2 feet)	Surface Soil (0 -2 feet)	Dermal	4,4'-DDE	2.3E+00	mg/kg	1.1E-06	mg/kg-day	3.4E-01	1/(mg/kg-day)	3.9E-07	NA	NA	NA	NA	NA
			Exp. Route Total								3.9E-07					0.0E+00
		Exposure Point Total									1.6E-06					0.0E+00
	Exposure Medium Total										1.6E-06					0.0E+00
Soil	Ambient Air	Emissions from Surface Soil	Inhalation	4,4'-DDE	3.5E-09	mg/m^3	1.5E-09	mg/m^3	9.7E-05	1/(ug/m^3)	1.4E-10	NA	NA	NA	NA	NA
			Exp. Route Total								1.4E-10					0.0E+00
		Exposure Point Total									1.4E-10					0.0E+00
	Exposure Medium Total										1.4E-10					0.0E+00
Soil Total											1.6E-06					0.0E+00
Receptor Total											1.6E-06					0.0E+00

NA = Not applicable.

Table 9.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil	4,4'-DDE	1E-07	NA	1E-07	2E-07	NA	NA	NA	NA	NA
		Exposure Point Total		1E-07	NA	1E-07	2E-07		0E+00	NA	0E+00	0E+00
	Exposure Medium Total			1E-07	NA	1E-07	2E-07		0E+00	NA	0E+00	0E+00
	Ambient Air	Emissions from Surface Soil	4,4'-DDE	NA	6E-12	NA	6E-12	NA	NA	NA	NA	NA
		Exposure Point Total		NA	6E-12	NA	6E-12		NA	0E+00	NA	0E+00
	Exposure Medium Total			NA	6E-12	NA	6E-12		NA	0E+00	NA	0E+00
Medium Total				1E-07	6E-12	1E-07	2E-07		0E+00	0E+00	0E+00	0E+00
Receptor Total				1E-07	6E-12	1E-07	2E-07		0E+00	0E+00	0E+00	0E+00

NA = Not applicable or not available

Table 9.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil	4,4'-DDE	8E-08	NA	7E-08	1E-07	NA	NA	NA	NA	NA
		Exposure Point Total		8E-08	NA	7E-08	1E-07		0E+00	NA	0E+00	0E+00
	Exposure Medium Total			8E-08	NA	7E-08	1E-07		0E+00	NA	0E+00	0E+00
	Ambient Air	Emissions from Surface Soil	4,4'-DDE	NA	2E-12	NA	2E-12	NA	NA	NA	NA	NA
		Exposure Point Total		NA	2E-12	NA	2E-12		NA	0E+00	NA	0E+00
	Exposure Medium Total			NA	2E-12	NA	2E-12		NA	0E+00	NA	0E+00
Medium Total				8E-08	2E-12	7E-08	1E-07		0E+00	0E+00	0E+00	0E+00
Receptor Total				8E-08	2E-12	7E-08	1E-07		0E+00	0E+00	0E+00	0E+00

NA = Not applicable or not available

Table 9.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil	4,4'-DDE	3E-07	NA	7E-08	3E-07	NA	NA	NA	NA	NA
		Exposure Point Total		3E-07	NA	7E-08	3E-07		0E+00	NA	0E+00	0E+00
	Exposure Medium Total			3E-07	NA	7E-08	3E-07		0E+00	NA	0E+00	0E+00
	Ambient Air	Emissions from Surface Soil	4,4'-DDE	NA	1E-12	NA	1E-12	NA	NA	NA	NA	NA
		Exposure Point Total		NA	1E-12	NA	1E-12		NA	0E+00	NA	0E+00
	Exposure Medium Total			NA	1E-12	NA	1E-12		NA	0E+00	NA	0E+00
Medium Total				3E-07	1E-12	7E-08	3E-07		0E+00	0E+00	0E+00	0E+00
Receptor Total				3E-07	1E-12	7E-08	3E-07		0E+00	0E+00	0E+00	0E+00

NA = Not applicable or not available

Table 9.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Fish	Lagoon	4,4'-DDD	9E-07	NA	NA	9E-07	NA	NA	NA	NA	NA
			4,4'-DDE	2E-05	NA	NA	2E-05	NA	NA	NA	NA	NA
			4,4'-DDT	4E-07	NA	NA	4E-07	Liver	7E-03	NA	NA	7E-03
		Exposure Point Total		3E-05	NA	NA	3E-05		7E-03	NA	NA	7E-03
	Exposure Medium Total			3E-05	NA	NA	3E-05		7E-03	NA	NA	7E-03
Medium Total				3E-05	NA	NA	3E-05		7E-03	NA	NA	7E-03
Receptor Total				3E-05	NA	NA	3E-05		7E-03	NA	NA	7E-03

NA = Not applicable or not available

Total Liver HI Across Media = 7E-03

Table 9.5
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Fish	Lagoon	4,4'-DDD	7E-07	NA	NA	7E-07	NA	NA	NA	NA	NA
			4,4'-DDE	2E-05	NA	NA	2E-05	NA	NA	NA	NA	NA
			4,4'-DDT	3E-07	NA	NA	3E-07	Liver	1E-02	NA	NA	1E-02
		Exposure Point Total		2E-05	NA	NA	2E-05		1E-02	NA	NA	1E-02
	Exposure Medium Total			2E-05	NA	NA	2E-05		1E-02	NA	NA	1E-02
Medium Total				2E-05	NA	NA	2E-05		1E-02	NA	NA	1E-02
Receptor Total				2E-05	NA	NA	2E-05		1E-02	NA	NA	1E-02

NA = Not applicable or not available

Total Liver HI Across Media = 1E-02

Table 9.6
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Fish	Lagoon	4,4'-DDD	5E-07	NA	NA	5E-07	NA	NA	NA	NA	NA
			4,4'-DDE	1E-05	NA	NA	1E-05	NA	NA	NA	NA	NA
			4,4'-DDT	2E-07	NA	NA	2E-07	Liver	2E-02	NA	NA	2E-02
		Exposure Point Total		1E-05	NA	NA	1E-05		2E-02	NA	NA	2E-02
	Exposure Medium Total			1E-05	NA	NA	1E-05		2E-02	NA	NA	2E-02
Medium Total				1E-05	NA	NA	1E-05		2E-02	NA	NA	2E-02
Receptor Total				1E-05	NA	NA	1E-05		2E-02	NA	NA	2E-02

NA = Not applicable or not available

Total Liver HI Across Media = 2E-02

Table 9.7
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Blue Crab Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Blue Crab	Lagoon	4,4'-DDD	5E-07	NA	NA	5E-07	NA	NA	NA	NA	NA
			4,4'-DDE	4E-05	NA	NA	4E-05	NA	NA	NA	NA	NA
			4,4'-DDT	3E-06	NA	NA	3E-06	Liver	5E-02	NA	NA	5E-02
		Exposure Point Total		5E-05	NA	NA	5E-05		5E-02	NA	NA	5E-02
	Exposure Medium Total			5E-05	NA	NA	5E-05		5E-02	NA	NA	5E-02
Medium Total				5E-05	NA	NA	5E-05		5E-02	NA	NA	5E-02
Receptor Total				5E-05	NA	NA	5E-05		5E-02	NA	NA	5E-02

NA = Not applicable or not available

Total Liver HI Across Media = 5E-02

Table 9.8
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Blue Crab Consumer
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Blue Crab	Lagoon	4,4'-DDD	5E-07	NA	NA	5E-07	NA	NA	NA	NA	NA
			4,4'-DDE	3E-05	NA	NA	3E-05	NA	NA	NA	NA	NA
			4,4'-DDT	2E-06	NA	NA	2E-06	Liver	9E-02	NA	NA	9E-02
		Exposure Point Total		3E-05	NA	NA	3E-05		9E-02	NA	NA	9E-02
	Exposure Medium Total			3E-05	NA	NA	3E-05		9E-02	NA	NA	9E-02
Medium Total				3E-05	NA	NA	3E-05		9E-02	NA	NA	9E-02
Receptor Total				3E-05	NA	NA	3E-05		9E-02	NA	NA	9E-02

NA = Not applicable or not available

Total Liver HI Across Media = 9E-02

Table 9.9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Blue Crab Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Blue Crab	Lagoon	4,4'-DDD	5E-06	NA	NA	5E-06	NA	NA	NA	NA	NA
			4,4'-DDE	2E-05	NA	NA	2E-05	NA	NA	NA	NA	NA
			4,4'-DDT	2E-06	NA	NA	2E-06	Liver	1E-01	NA	NA	1E-01
		Exposure Point Total		3E-05	NA	NA	3E-05		1E-01	NA	NA	1E-01
	Exposure Medium Total			3E-05	NA	NA	3E-05		1E-01	NA	NA	1E-01
Medium Total				3E-05	NA	NA	3E-05		1E-01	NA	NA	1E-01
Receptor Total				3E-05	NA	NA	3E-05		1E-01	NA	NA	1E-01

NA = Not applicable or not available

Total Liver HI Across Media = 1E-01

Table 9.10
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil	4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Exposure Point Total		0E+00	NA	0E+00	0E+00		0E+00	NA	0E+00	0E+00
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		0E+00	NA	0E+00	0E+00
	Ambient Air	Emissions from Surface Soil	4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Exposure Point Total		NA	0E+00	NA	0E+00		NA	0E+00	NA	0E+00
	Exposure Medium Total			NA	0E+00	NA	0E+00		NA	0E+00	NA	0E+00
Medium Total				0E+00	0E+00	0E+00	0E+00		0E+00	0E+00	0E+00	0E+00
Receptor Total				0E+00	0E+00	0E+00	0E+00		0E+00	0E+00	0E+00	0E+00

NA = Not applicable or not available

Table 9.11
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil	4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Exposure Point Total		0E+00	NA	0E+00	0E+00		0E+00	NA	0E+00	0E+00
	Exposure Medium Total			0E+00	NA	0E+00	0E+00		0E+00	NA	0E+00	0E+00
	Ambient Air	Emissions from Surface Soil	4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Exposure Point Total		NA	0E+00	NA	0E+00		NA	0E+00	NA	0E+00
	Exposure Medium Total			NA	0E+00	NA	0E+00		NA	0E+00	NA	0E+00
Medium Total				0E+00	0E+00	0E+00	0E+00		0E+00	0E+00	0E+00	0E+00
Receptor Total				0E+00	0E+00	0E+00	0E+00		0E+00	0E+00	0E+00	0E+00

NA = Not applicable or not available

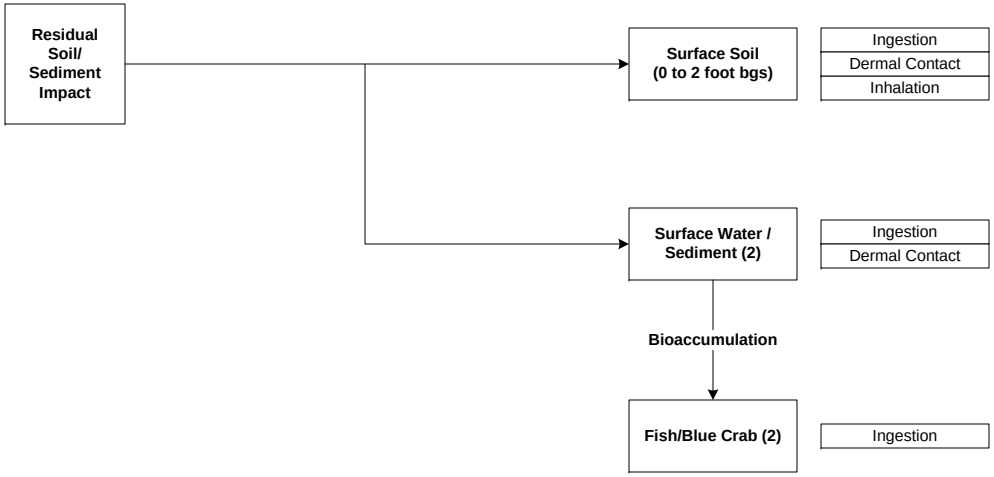
Table 9.12
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult/Child Aggregate

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	Surface Soil	4,4'-DDE	1E-06	NA	4E-07	2E-06	NA	NA	NA	NA	NA
		Exposure Point Total		1E-06	NA	4E-07	2E-06		0E+00	NA	0E+00	0E+00
	Exposure Medium Total			1E-06	NA	4E-07	2E-06		0E+00	NA	0E+00	0E+00
	Ambient Air	Emissions from Surface Soil	4,4'-DDE	NA	1E-10	NA	1E-10	NA	NA	NA	NA	NA
		Exposure Point Total		NA	1E-10	NA	1E-10		NA	0E+00	NA	0E+00
	Exposure Medium Total			NA	1E-10	NA	1E-10		NA	0E+00	NA	0E+00
Medium Total				1E-06	1E-10	4E-07	2E-06		0E+00	0E+00	0E+00	0E+00
Receptor Total				1E-06	1E-10	4E-07	2E-06		0E+00	0E+00	0E+00	0E+00

NA = Not applicable or not available

Attachment C-2
Figure



Exposure Media	Exposure Route	Potential Human Receptors: Current/Future: Recreational User/ Trespasser/ Site Visitor: Adult	Youth	Child	Fish/Blue Crab Consumer: Adult	Youth	Child	Future: Maintenance Worker	Industrial Worker	Construction Worker	Residential: Adult	Child
Surface Soil (0 to 2 foot bgs)	Ingestion	X	X	X				X (1)	X (1)	X (1)	X	X
	Dermal Contact	X	X	X				X (1)	X (1)	X (1)	X	X
	Inhalation	X	X	X				X (1)	X (1)	X (1)	X	X
Surface Water / Sediment (2)	Ingestion	X (1)	X (1)	X (1)								
	Dermal Contact	X (1)	X (1)	X (1)								
Fish/Blue Crab (2)	Ingestion				X	X	X					

Legend
X – Potentially complete exposure pathways identified
(1) – no chemical of potential concern was identified for this exposure pathway.
(2) – due to the lack of surface water data, sediment data were used to evaluate this exposure pathway.

Figure 1
Conceptual Site Model for HHRA
Laguna La Chiva
Vieques, Puerto Rico

Attachment C-3
Tables

TABLE 1

HHRA Sample Assignments

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

StationID	SampleID	Date Collected	Matrix	Upper Depth (feet)	Lower Depth (feet)	Water Depth (feet)	Current/Future (Recreational User/Trespasser/Site Visitor), Future (Residential)	Future (Maintenance Worker/Industrial Worker/Construction Worker)	Current/Future (Recreational User/Trespasser/Site Visitor) (2)	Current/Future (Fish Consumer/Blue Crab Consumer) (3)
VENO-SD01	VENO-SD01-000H (1)	5/15/2013	SD	0	0.5	0.25			x	x
VENO-SD01	VENO-SD01-0H01	5/15/2013	SD	0.5	1	0.25			x	
VENO-SD02	VENO-SD02-000H	5/15/2013	SD	0	0.5	0.25			x	x
VENO-SD02	VENO-SD02-0H01	5/15/2013	SD	0.5	1	0.25			x	
VENO-SD03	VENO-SD03-000H	5/15/2013	SD	0	0.5	0.25			x	x
VENO-SD04	VENO-SD04-000H	5/17/2013	SD	0	0.5	0.5			x	x
VENO-SD04	VENO-SD04-0H01	5/17/2013	SD	0.5	1	0.5			x	
VENO-SD05	VENO-SD05-000H	5/17/2013	SD	0	0.5	5				x
VENO-SD06	VENO-SD06-000H	5/17/2013	SD	0	0.5	5				x
VENO-SD07	VENO-SD07-000H (1)	5/17/2013	SD	0	0.5	2			x	x
VENO-SD08	VENO-SD08-000H	5/16/2013	SD	0	0.5	0.25			x	x
VENO-SD09	VENO-SD09-000H	5/16/2013	SD	0	0.5	0.25			x	x
VENO-SD10	VENO-SD10-000H	5/16/2013	SD	0	0.5	0.25			x	x
VENO-SD11	VENO-SD11-000H	5/16/2013	SD	0	0.5	1			x	x
VENO-SD11	VENO-SD11-0H01	5/16/2013	SD	0.5	1	1			x	
VENO-SD12	VENO-SD12-000H	5/15/2013	SD	0	0.5	0.25			x	x
VENO-SO01	VENO-SS01-0002 (1)	5/14/2013	SS	0	2		x	x		
VENO-SO02	VENO-SS02-0001	5/16/2013	SS	0	1		x	x		
VENO-SO03	VENO-SS03-0001	5/16/2013	SS	0	1		x	x		
VENO-SO04	VENO-SS04-0001	5/14/2013	SS	0	1		x	x		
VENO-SO05	VENO-SS05-0002	5/14/2013	SS	0	2		x	x		
VENO-SO06	VENO-SS06-0001	5/16/2013	SS	0	1		x	x		
VENO-SO07	VENO-SS07-0002	5/14/2013	SS	0	2		x	x		

Notes:

(1) For samples with a paired field duplicate sample, the higher detected concentration was used when at least one value was detected and the lower of the two reporting limits was used when both values were non-detects.

(2) Sediment samples collected from the locations where surface water depth is greater than 3 feet were excluded.

(3) Sediment samples collected from the shallow depth interval (0 to 0.5 feet) were used for food chain modeling.

Matrix: SD - sediment; SS - surface soil

TABLE 2

Selection of Whole Body BSAF Values

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

4,4'-DDD					
Superfund Site	**Organism Common Name**	**Fresh or Saltwater Species**	**Commonly Consumed (Yes or No)**	**Biota Tissue Supplemental**	**BSAF**
Naval Education & Training Center, Old Fire Fighting Training Area	cunner	Saltwater	Yes	single or multiple organisms	0.255
				Average	**0.255**

4,4'-DDE					
Superfund Site	**Organism Common Name**	**Fresh or Saltwater Species**	**Commonly Consumed (Yes or No)**	**Biota Tissue Supplemental**	**BSAF**
Calcasieu Estuary	spot	Saltwater	Yes	single or multiple organisms	0.111
Naval Education & Training Center, Derecktor Shipyard	cunner	Saltwater	Yes	composite	8.43
Naval Education & Training Center, McAllister Point Landfill	cunner	Saltwater	Yes	composite	34.8
				Average	**14.4**

4,4'-DDT					
Superfund Site	**Organism Common Name**	**Fresh or Saltwater Species**	**Commonly Consumed (Yes or No)**	**Biota Tissue Supplemental**	**BSAF**
Naval Education & Training Center, Old Fire Fighting Training Area	cunner	Saltwater	Yes	single or multiple organisms	0.232
				Average	**0.232**

Notes:

BSAF values presented are whole-body values. Biota age class was not reported.

BSAF = biota-sediment accumulation factor

Attachment C-4
ProUCL Output

Attachment C4

ProUCL, Version 4.1 Output, Shallow Sediment (0 to 0.5 feet bgs) at Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDD (MG/KG)

General Statistics

Number of Valid Data	12	Number of Detected Data	8
Number of Distinct Detected Data	8	Number of Non-Detect Data	4
		Percent Non-Detects	33.33%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0026	Minimum Detected	-5.952
Maximum Detected	0.15	Maximum Detected	-1.897
Mean of Detected	0.0338	Mean of Detected	-4.353
SD of Detected	0.0529	SD of Detected	1.415
Minimum Non-Detect	0.0038	Minimum Non-Detect	-5.573
Maximum Non-Detect	0.0058	Maximum Non-Detect	-5.15

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	6
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	6
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	50.00%

Warning: There are only 8 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.657	Shapiro Wilk Test Statistic	0.886
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0233	Mean	-4.92
SD	0.0449	SD	1.409
95% DL/2 (t) UCL	0.0466	95% H-Stat (DL/2) UCL	0.095
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-5.009
		SD in Log Scale	1.506
		Mean in Original Scale	0.0232
		SD in Original Scale	0.045
		95% t UCL	0.0465

Attachment C4

ProUCL, Version 4.1 Output, Shallow Sediment (0 to 0.5 feet bgs) at Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

General UCL Statistics for Data Sets with Non-Detects

95% Percentile Bootstrap UCL	0.0468
95% BCA Bootstrap UCL	0.0532
95% H-UCL	0.122

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	0.48
Theta Star	0.0703
nu star	7.686
A-D Test Statistic	0.816
5% A-D Critical Value	0.753
K-S Test Statistic	0.753
5% K-S Critical Value	0.306

Data follow Appr. Gamma Distribution at 5% Significance Level

Data Distribution Test with Detected Values Only

Data Follow Appr. Gamma Distribution at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Data

Minimum	0.000001
Maximum	0.15
Mean	0.0225
Median	0.00555
SD	0.0453
k star	0.204
Theta star	0.11
Nu star	4.905
AppChi2	1.109
95% Gamma Approximate UCL (Use when n >= 40)	0.0996
95% Adjusted Gamma UCL (Use when n < 40)	0.128

Note: DL/2 is not a recommended method.

Nonparametric Statistics

Kaplan-Meier (KM) Method

Mean	0.0235
SD	0.0429
SE of Mean	0.0132
95% KM (t) UCL	0.0473
95% KM (z) UCL	0.0453
95% KM (jackknife) UCL	0.0465
95% KM (bootstrap t) UCL	0.241
95% KM (BCA) UCL	0.0476
95% KM (Percentile Bootstrap) UCL	0.0469
95% KM (Chebyshev) UCL	0.0812
97.5% KM (Chebyshev) UCL	0.106
99% KM (Chebyshev) UCL	0.155

Potential UCLs to Use

95% KM (BCA) UCL	0.0476

4,4'-DDE (MG/KG)

General Statistics

Number of Valid Data	12	Number of Detected Data	6
Number of Distinct Detected Data	4	Number of Non-Detect Data	6
		Percent Non-Detects	50.00%

Raw Statistics

Minimum Detected	0.014
Maximum Detected	0.02
Mean of Detected	0.0163
SD of Detected	0.00225
Minimum Non-Detect	0.0026
Maximum Non-Detect	0.0072

Log-transformed Statistics

Minimum Detected	-4.269
Maximum Detected	-3.912
Mean of Detected	-4.122
SD of Detected	0.136
Minimum Non-Detect	-5.952
Maximum Non-Detect	-4.934

Note: Data have multiple DLs - Use of KM Method is recommended

For all methods (except KM, DL/2, and ROS Methods),

Observations < Largest ND are treated as NDs

Number treated as Non-Detect	6
Number treated as Detected	6
Single DL Non-Detect Percentage	50.00%

Attachment C4

ProUCL, Version 4.1 Output, Shallow Sediment (0 to 0.5 feet bgs) at Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

General UCL Statistics for Data Sets with Non-Detects

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.905
5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level	

Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.911
5% Shapiro Wilk Critical Value	0.788
Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution	
DL/2 Substitution Method	
Mean	0.00937
SD	0.00745
95% DL/2 (t) UCL	0.0132
Maximum Likelihood Estimate(MLE) Method	
Mean	0.00853
SD	0.00869
95% MLE (t) UCL	0.013
95% MLE (Tiku) UCL	0.0141

Assuming Lognormal Distribution	
DL/2 Substitution Method	
Mean	-5.102
SD	1.054
95% H-Stat (DL/2) UCL	0.0276
Log ROS Method	
Mean in Log Scale	-4.319
SD in Log Scale	0.227
Mean in Original Scale	0.0136
SD in Original Scale	0.00321
95% t UCL	0.0153
95% Percentile Bootstrap UCL	0.0152
95% BCA Bootstrap UCL	0.0152
95% H UCL	0.0155

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	32.53
Theta Star	0.0005021
nu star	390.4
A-D Test Statistic	0.359
5% A-D Critical Value	0.697
K-S Test Statistic	0.697
5% K-S Critical Value	0.332
Data appear Gamma Distributed at 5% Significance Level	

Data Distribution Test with Detected Values Only
Data appear Normal at 5% Significance Level

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.0152
SD	0.00186
SE of Mean	0.0005893
95% KM (t) UCL	0.0162

Attachment C4

ProUCL, Version 4.1 Output, Shallow Sediment (0 to 0.5 feet bgs) at Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

General UCL Statistics for Data Sets with Non-Detects

Assuming Gamma Distribution			
Gamma ROS Statistics using Extrapolated Data		95% KM (z) UCL	0.0161
Minimum	0.0017	95% KM (jackknife) UCL	0.0162
Maximum	0.02	95% KM (bootstrap t) UCL	0.0166
Mean	0.0107	95% KM (BCA) UCL	0.0169
Median	0.0109	95% KM (Percentile Bootstrap) UCL	0.0168
SD	0.00622	95% KM (Chebyshev) UCL	0.0177
k star	1.946	97.5% KM (Chebyshev) UCL	0.0188
Theta star	0.0055	99% KM (Chebyshev) UCL	0.021
Nu star	46.69	Potential UCLs to Use	
AppChi2	32.01	95% KM (t) UCL	0.0162
95% Gamma Approximate UCL (Use when n >= 40)	0.0156	95% KM (Percentile Bootstrap) UCL	0.0168
95% Adjusted Gamma UCL (Use when n < 40)	0.0166		

Note: DL/2 is not a recommended method.

4,4'-DDT (MG/KG)

General Statistics

Number of Valid Data	12	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	8
		Percent Non-Detects	66.67%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0037	Minimum Detected	-5.599
Maximum Detected	0.054	Maximum Detected	-2.919
Mean of Detected	0.0176	Mean of Detected	-4.693
SD of Detected	0.0244	SD of Detected	1.246
Minimum Non-Detect	0.0026	Minimum Non-Detect	-5.952
Maximum Non-Detect	0.0084	Maximum Non-Detect	-4.78

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	10
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	2
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	83.33%

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.703	Shapiro Wilk Test Statistic	0.837
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Attachment C4

ProUCL, Version 4.1 Output, Shallow Sediment (0 to 0.5 feet bgs) at Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

General UCL Statistics for Data Sets with Non-Detects

Assuming Normal Distribution

DL/2 Substitution Method	
Mean	0.00765
SD	0.0147
95% DL/2 (t) UCL	0.0153
Maximum Likelihood Estimate(MLE) Method	N/A

MLE method failed to converge properly

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean	-5.554
SD	0.956
95% H-Stat (DL/2) UCL	0.0138
Log ROS Method	
Mean in Log Scale	-5.845
SD in Log Scale	1.143
Mean in Original Scale	0.00707
SD in Original Scale	0.0149
95% t UCL	0.0148
95% Percentile Bootstrap UCL	0.0154
95% BCA Bootstrap UCL	0.0198
95% H-UCL	0.0167

Gamma Distribution Test with Detected Values Only

k star (bias corrected)	0.39
Theta Star	0.0452
nu star	3.121
A-D Test Statistic	0.574
5% A-D Critical Value	0.668
K-S Test Statistic	0.668
5% K-S Critical Value	0.404

Data appear Gamma Distributed at 5% Significance Level

Data Distribution Test with Detected Values Only

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000001
Maximum	0.054
Mean	0.00588
Median	0.000001
SD	0.0154
k star	0.159
Theta star	0.0369
Nu star	3.817
AppChi2	0.651
95% Gamma Approximate UCL (Use when n >= 40)	0.0345
95% Adjusted Gamma UCL (Use when n < 40)	N/A

Note: DL/2 is not a recommended method.

Nonparametric Statistics

Kaplan-Meier (KM) Method	
Mean	0.00838
SD	0.0138
SE of Mean	0.00461
95% KM (t) UCL	0.0167
95% KM (z) UCL	0.016
95% KM (jackknife) UCL	0.0157
95% KM (bootstrap t) UCL	0.0511
95% KM (BCA) UCL	0.054
95% KM (Percentile Bootstrap) UCL	0.0201
95% KM (Chebyshev) UCL	0.0285
97.5% KM (Chebyshev) UCL	0.0372
99% KM (Chebyshev) UCL	0.0542

Potential UCLs to Use

95% KM (t) UCL	0.0167

Attachment C-5
Comparison of Detection Limits to Screening Levels

Attachment C-5

Comparison of Detection Limit to Screening Levels for 100% Non-detected Chemicals

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Sample Medium	CAS No.	ParamName	Units	Minimum Detection Limit (MinDL)	Maximum Detection Limit (MaxDL)	Minimum Reporting Limit (MinRL)	Maximum Reporting Limit (MaxRL)	Frequency of NonDetect	Screening Levels (SLs)	SL Basis	MaxDL Exceeds SL?	MaxRL Exceeds SL?
Sediment	92-52-4	1,1-Biphenyl	MG/KG	0.1	0.27	0.11	0.29	0 / 12	5.1	n	No	No
Sediment	95-94-3	1,2,4,5-Tetrachlorobenzene	MG/KG	0.073	0.2	0.11	0.29	0 / 12	1.8	n	No	No
Sediment	108-60-1	2,2'-Oxybis(1-chloropropane)	MG/KG	0.086	0.24	0.11	0.29	0 / 12	4.6	c	No	No
Sediment	58-90-2	2,3,4,6-Tetrachlorophenol	MG/KG	0.078	0.31	0.21	0.84	0 / 13	180	n	No	No
Sediment	95-95-4	2,4,5-Trichlorophenol	MG/KG	0.061	0.24	0.11	0.42	0 / 13	610	n	No	No
Sediment	88-06-2	2,4,6-Trichlorophenol	MG/KG	0.063	0.25	0.11	0.42	0 / 13	6.1	n	No	No
Sediment	120-83-2	2,4-Dichlorophenol	MG/KG	0.075	0.3	0.11	0.42	0 / 13	18	n	No	No
Sediment	105-67-9	2,4-Dimethylphenol	MG/KG	0.078	0.31	0.11	0.42	0 / 13	120	n	No	No
Sediment	51-28-5	2,4-Dinitrophenol	MG/KG	0.13	0.5	0.32	1.3	0 / 13	12	n	No	No
Sediment	121-14-2	2,4-Dinitrotoluene	MG/KG	0.076	0.21	0.11	0.29	0 / 12	1.6	c	No	No
Sediment	606-20-2	2,6-Dinitrotoluene	MG/KG	0.073	0.2	0.11	0.29	0 / 12	0.33	c	No	No
Sediment	95-57-8	2-Chlorophenol	MG/KG	0.086	0.34	0.11	0.42	0 / 13	39	n	No	No
Sediment	95-48-7	2-Methylphenol	MG/KG	0.074	0.29	0.11	0.42	0 / 13	310	n	No	No
Sediment	88-74-4	2-Nitroaniline	MG/KG	0.07	0.19	0.11	0.29	0 / 12	61	n	No	No
Sediment	88-75-5	2-Nitrophenol	MG/KG	0.082	0.33	0.11	0.42	0 / 13	NA		--	--
Sediment	m&pCRESOL	3- and 4-Methylphenol	MG/KG	0.17	0.67	0.21	0.84	0 / 13	310	n	No	No
Sediment	91-94-1	3,3'-Dichlorobenzidine	MG/KG	0.096	0.26	0.11	0.29	0 / 12	1.1	c	No	No
Sediment	99-09-2	3-Nitroaniline	MG/KG	0.078	0.21	0.11	0.29	0 / 12	NA		--	--
Sediment	534-52-1	4,6-Dinitro-2-methylphenol	MG/KG	0.14	0.55	0.32	1.3	0 / 13	0.49	n	**Yes**	**Yes**
Sediment	101-55-3	4-Bromophenyl-phenylether	MG/KG	0.077	0.21	0.11	0.29	0 / 12	NA		--	--
Sediment	59-50-7	4-Chloro-3-methylphenol	MG/KG	0.07	0.28	0.11	0.42	0 / 13	610	n	No	No
Sediment	106-47-8	4-Chloroaniline	MG/KG	0.097	0.27	0.11	0.29	0 / 12	2.4	c	No	No
Sediment	7005-72-3	4-Chlorophenyl-phenylether	MG/KG	0.07	0.19	0.11	0.29	0 / 12	NA		--	--
Sediment	100-01-6	4-Nitroaniline	MG/KG	0.086	0.24	0.11	0.29	0 / 12	24	c	No	No
Sediment	100-02-7	4-Nitrophenol	MG/KG	0.086	0.34	0.11	0.42	0 / 13	NA		--	--
Sediment	98-86-2	Acetophenone	MG/KG	0.087	0.24	0.11	0.29	0 / 12	780	n	No	No
Sediment	1912-24-9	Atrazine	MG/KG	0.078	0.21	0.11	0.29	0 / 12	2.1	c	No	No
Sediment	100-52-7	Benzaldehyde	MG/KG	0.1	0.29	0.11	0.29	0 / 12	780	n	No	No
Sediment	111-91-1	bis(2-Chloroethoxy)methane	MG/KG	0.067	0.18	0.11	0.29	0 / 12	18	n	No	No
Sediment	111-44-4	bis(2-Chloroethyl)ether	MG/KG	0.097	0.27	0.11	0.29	0 / 12	0.21	c	**Yes**	**Yes**
Sediment	117-81-7	bis(2-Ethylhexyl)phthalate	MG/KG	0.089	0.25	0.11	0.29	0 / 12	35	c	No	No
Sediment	85-68-7	Butylbenzylphthalate	MG/KG	0.098	0.27	0.11	0.29	0 / 12	260	c	No	No
Sediment	105-60-2	Caprolactam	MG/KG	0.11	0.29	0.21	0.58	0 / 12	3000	n	No	No
Sediment	86-74-8	Carbazole	MG/KG	0.071	0.2	0.11	0.29	0 / 12	NA		--	--
Sediment	132-64-9	Dibenzofuran	MG/KG	0.069	0.19	0.11	0.29	0 / 12	7.8	n	No	No
Sediment	84-66-2	Diethylphthalate	MG/KG	0.079	0.22	0.11	0.29	0 / 12	4900	n	No	No
Sediment	131-11-3	Dimethyl phthalate	MG/KG	0.065	0.18	0.11	0.29	0 / 12	NA		--	--
Sediment	84-74-2	Di-n-butylphthalate	MG/KG	0.083	0.23	0.11	0.29	0 / 12	610	n	No	No
Sediment	117-84-0	Di-n-octylphthalate	MG/KG	0.07	0.19	0.11	0.29	0 / 12	61	n	No	No
Sediment	118-74-1	Hexachlorobenzene	MG/KG	0.085	0.23	0.11	0.29	0 / 12	0.3	c	No	No
Sediment	87-68-3	Hexachlorobutadiene	MG/KG	0.084	0.23	0.11	0.29	0 / 12	6.1	n	No	No
Sediment	77-47-4	Hexachlorocyclopentadiene	MG/KG	0.098	0.27	0.11	0.29	0 / 12	37	n	No	No
Sediment	67-72-1	Hexachloroethane	MG/KG	0.078	0.21	0.11	0.29	0 / 12	4.3	n	No	No
Sediment	78-59-1	Isophorone	MG/KG	0.076	0.21	0.11	0.29	0 / 12	510	c	No	No
Sediment	98-95-3	Nitrobenzene	MG/KG	0.083	0.23	0.11	0.29	0 / 12	4.8	c	No	No
Sediment	621-64-7	n-Nitroso-di-n-propylamine	MG/KG	0.095	0.26	0.11	0.29	0 / 12	0.069	c	**Yes**	**Yes**
Sediment	86-30-6	n-Nitrosodiphenylamine	MG/KG	0.15	0.4	0.21	0.58	0 / 12	99	c	No	No
Sediment	87-86-5	Pentachlorophenol	MG/KG	0.15	0.59	0.32	1.3	0 / 13	0.89	c	No	**Yes**
Sediment	108-95-2	Phenol	MG/KG	0.08	0.32	0.11	0.42	0 / 13	1800	n	No	No
Sediment	71-55-6	1,1,1-Trichloroethane	MG/KG	0.0004	0.002	0.0012	0.0058	0 / 16	640	sat	No	No
Sediment	79-34-5	1,1,2,2-Tetrachloroethane	MG/KG	0.0004	0.0017	0.0012	0.0058	0 / 16	0.56	c	No	No
Sediment	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	MG/KG	0.0007	0.0035	0.0012	0.0058	0 / 16	910	sat	No	No
Sediment	79-00-5	1,1,2-Trichloroethane	MG/KG	0.0007	0.0035	0.0012	0.0058	0 / 16	0.16	n	No	No

Attachment C-5

Comparison of Detection Limit to Screening Levels for 100% Non-detected Chemicals

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Sample Medium	CAS No.	ParamName	Units	Minimum Detection Limit (MinDL)	Maximum Detection Limit (MaxDL)	Minimum Reporting Limit (MinRL)	Maximum Reporting Limit (MaxRL)	Frequency of NonDetect	Screening Levels (SLs)	SL Basis	MaxDL Exceeds SL?	MaxRL Exceeds SL?
Sediment	75-34-3	1,1-Dichloroethane	MG/KG	0.0007	0.0033	0.0012	0.0058	0 / 16	3.3	c	No	No
Sediment	75-35-4	1,1-Dichloroethene	MG/KG	0.0007	0.0036	0.0012	0.0058	0 / 16	24	n	No	No
Sediment	87-61-6	1,2,3-Trichlorobenzene	MG/KG	0.0011	0.0052	0.0012	0.0058	0 / 16	4.9	n	No	No
Sediment	120-82-1	1,2,4-Trichlorobenzene	MG/KG	0.001	0.0049	0.0012	0.0058	0 / 16	6.2	n	No	No
Sediment	96-12-8	1,2-Dibromo-3-chloropropane	MG/KG	0.0007	0.0033	0.0012	0.0058	0 / 16	0.0054	c	No	**Yes**
Sediment	106-93-4	1,2-Dibromoethane	MG/KG	0.0004	0.0018	0.0012	0.0058	0 / 16	0.034	c	No	No
Sediment	95-50-1	1,2-Dichlorobenzene	MG/KG	0.0005	0.0025	0.0012	0.0058	0 / 16	190	n	No	No
Sediment	107-06-2	1,2-Dichloroethane	MG/KG	0.0004	0.0018	0.0012	0.0058	0 / 16	0.43	c	No	No
Sediment	78-87-5	1,2-Dichloropropane	MG/KG	0.0006	0.0032	0.0012	0.0058	0 / 16	0.94	c	No	No
Sediment	541-73-1	1,3-Dichlorobenzene	MG/KG	0.0006	0.0027	0.0012	0.0058	0 / 16	NA		--	--
Sediment	106-46-7	1,4-Dichlorobenzene	MG/KG	0.0005	0.0026	0.0012	0.0058	0 / 16	2.4	c	No	No
Sediment	591-78-6	2-Hexanone	MG/KG	0.0011	0.0052	0.0029	0.014	0 / 16	21	n	No	No
Sediment	108-10-1	4-Methyl-2-pentanone	MG/KG	0.0016	0.0081	0.0029	0.014	0 / 16	530	n	No	No
Sediment	71-43-2	Benzene	MG/KG	0.0005	0.0023	0.0012	0.0058	0 / 16	1.1	c	No	No
Sediment	74-97-5	Bromochloromethane	MG/KG	0.0004	0.002	0.0012	0.0058	0 / 16	16	n	No	No
Sediment	75-27-4	Bromodichloromethane	MG/KG	0.0004	0.002	0.0012	0.0058	0 / 16	0.27	c	No	No
Sediment	74-83-9	Bromomethane	MG/KG	0.0011	0.0052	0.0059	0.029	0 / 16	0.73	n	No	No
Sediment	56-23-5	Carbon tetrachloride	MG/KG	0.0007	0.0035	0.0012	0.0058	0 / 16	0.61	c	No	No
Sediment	108-90-7	Chlorobenzene	MG/KG	0.0006	0.0028	0.0012	0.0058	0 / 16	29	n	No	No
Sediment	75-00-3	Chloroethane	MG/KG	0.0006	0.0031	0.0012	0.0058	0 / 16	1500	n	No	No
Sediment	67-66-3	Chloroform	MG/KG	0.0005	0.0025	0.0012	0.0058	0 / 16	0.29	c	No	No
Sediment	74-87-3	Chloromethane	MG/KG	0.0008	0.0037	0.0012	0.0058	0 / 16	12	n	No	No
Sediment	156-59-2	cis-1,2-Dichloroethene	MG/KG	0.0006	0.0031	0.0012	0.0058	0 / 16	16	n	No	No
Sediment	10061-01-5	cis-1,3-Dichloropropene	MG/KG	0.0004	0.0017	0.0012	0.0058	0 / 16	1.7	c	No	No
Sediment	110-82-7	Cyclohexane	MG/KG	0.0006	0.0031	0.0012	0.0058	0 / 16	117	sat	No	No
Sediment	124-48-1	Dibromochloromethane	MG/KG	0.0003	0.0015	0.0012	0.0058	0 / 16	0.68	c	No	No
Sediment	75-71-8	Dichlorodifluoromethane (Freon-12)	MG/KG	0.0007	0.0036	0.0012	0.0058	0 / 16	9.4	n	No	No
Sediment	100-41-4	Ethylbenzene	MG/KG	0.0007	0.0032	0.0012	0.0058	0 / 16	5.4	c	No	No
Sediment	98-82-8	Isopropylbenzene	MG/KG	0.0006	0.0031	0.0012	0.0058	0 / 16	210	n	No	No
Sediment	m&pXYLENE	m- and p-Xylene	MG/KG	0.0012	0.0057	0.0023	0.012	0 / 16	63	n	No	No
Sediment	79-20-9	Methyl acetate	MG/KG	0.0019	0.0092	0.0059	0.029	0 / 16	7800	n	No	No
Sediment	108-87-2	Methylcyclohexane	MG/KG	0.0006	0.003	0.0012	0.0058	0 / 16	NA		--	--
Sediment	75-09-2	Methylene chloride	MG/KG	0.0008	0.004	0.0059	0.029	0 / 16	36	n	No	No
Sediment	1634-04-4	Methyl-tert-butyl ether (MTBE)	MG/KG	0.0003	0.0016	0.0012	0.0058	0 / 16	43	c	No	No
Sediment	95-47-6	o-Xylene	MG/KG	0.0006	0.003	0.0012	0.0058	0 / 16	69	n	No	No
Sediment	100-42-5	Styrene	MG/KG	0.0005	0.0025	0.0012	0.0058	0 / 16	630	n	No	No
Sediment	127-18-4	Tetrachloroethene	MG/KG	0.0006	0.0028	0.0012	0.0058	0 / 16	8.6	n	No	No
Sediment	108-88-3	Toluene	MG/KG	0.0005	0.0026	0.0012	0.0058	0 / 16	500	n	No	No
Sediment	156-60-5	trans-1,2-Dichloroethene	MG/KG	0.0008	0.004	0.0012	0.0058	0 / 16	15	n	No	No
Sediment	10061-02-6	trans-1,3-Dichloropropene	MG/KG	0.0004	0.0018	0.0012	0.0058	0 / 16	1.7	c	No	No
Sediment	79-01-6	Trichloroethene	MG/KG	0.0006	0.0029	0.0012	0.0058	0 / 16	0.44	n	No	No
Sediment	75-69-4	Trichlorofluoromethane (Freon-11)	MG/KG	0.0006	0.0031	0.0012	0.0058	0 / 16	79	n	No	No
Sediment	75-01-4	Vinyl chloride	MG/KG	0.0005	0.0025	0.0012	0.0058	0 / 16	0.06	c	No	No
Soil	72-54-8	4,4'-DDD	MG/KG	0.00063	0.051	0.0013	0.11	0 / 7	2	c	No	No
Soil	50-29-3	4,4'-DDT	MG/KG	0.00087	0.071	0.0013	0.11	0 / 7	1.7	c	No	No

Note:

EPA Regional Screening Levels for residential soil (TR=10-6 and HI=0.1) (EPA, 2013a) are used as Screening Levels

SL Basis: c - carcinogenic, n - non-carcinogenic, sat - soil saturation.

NA = Not Available

Attachment C-6
Analytical Data Used in the HHRA

Attachment C-6

Analytical Data Used in the HHRA

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.015	J	MG/KG	0.0017	0.0036	Yes
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.016	J	MG/KG	0.0019	0.0036	Yes
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0088	J	MG/KG	0.0024	0.0036	Yes
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	92-52-4	1,1-Biphenyl	0.18	UJ	MG/KG	0.17	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	95-94-3	1,2,4,5-Tetrachlorobenzene	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	108-60-1	2,2'-Oxybis(1-chloropropane)	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.36	U	MG/KG	0.13	0.36	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.18	U	MG/KG	0.1	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.18	U	MG/KG	0.11	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.18	U	MG/KG	0.13	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.18	U	MG/KG	0.13	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	0.55	UJ	MG/KG	0.22	0.55	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	121-14-2	2,4-Dinitrotoluene	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	606-20-2	2,6-Dinitrotoluene	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.18	U	MG/KG	0.15	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.18	U	MG/KG	0.13	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	88-74-4	2-Nitroaniline	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.18	U	MG/KG	0.14	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.36	U	MG/KG	0.29	0.36	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	91-94-1	3,3'-Dichlorobenzidine	0.18	UJ	MG/KG	0.16	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	99-09-2	3-Nitroaniline	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	0.55	UJ	MG/KG	0.24	0.55	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	101-55-3	4-Bromophenyl-phenylether	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.18	U	MG/KG	0.12	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	106-47-8	4-Chloroaniline	0.18	UJ	MG/KG	0.17	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	7005-72-3	4-Chlorophenyl-phenylether	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	100-01-6	4-Nitroaniline	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	98-86-2	Acetophenone	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	1912-24-9	Atrazine	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	100-52-7	Benzaldehyde	0.18	UJ	MG/KG	0.18	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	111-91-1	bis(2-Chloroethoxy)methane	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	111-44-4	bis(2-Chloroethyl)ether	0.18	UJ	MG/KG	0.17	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	117-81-7	bis(2-Ethylhexyl)phthalate	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	85-68-7	Butylbenzylphthalate	0.18	UJ	MG/KG	0.17	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	105-60-2	Caprolactam	0.36	UJ	MG/KG	0.18	0.36	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	86-74-8	Carbazole	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	132-64-9	Dibenzofuran	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	84-66-2	Diethylphthalate	0.18	UJ	MG/KG	0.14	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	131-11-3	Dimethyl phthalate	0.18	UJ	MG/KG	0.11	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	84-74-2	Di-n-butylphthalate	0.18	UJ	MG/KG	0.14	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	117-84-0	Di-n-octylphthalate	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	118-74-1	Hexachlorobenzene	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	87-68-3	Hexachlorobutadiene	0.18	UJ	MG/KG	0.14	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	77-47-4	Hexachlorocyclopentadiene	0.18	UJ	MG/KG	0.17	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	67-72-1	Hexachloroethane	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	78-59-1	Isophorone	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	98-95-3	Nitrobenzene	0.18	UJ	MG/KG	0.14	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	621-64-7	n-Nitroso-di-n-propylamine	0.18	UJ	MG/KG	0.16	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	86-30-6	n-Nitrosodiphenylamine	0.36	UJ	MG/KG	0.25	0.36	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	0.55	U	MG/KG	0.25	0.55	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	SVOA	108-95-2	Phenol	0.18	U	MG/KG	0.14	0.18	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0018	U	MG/KG	0.0006	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0018	U	MG/KG	0.0005	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0018	U	MG/KG	0.0011	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0018	U	MG/KG	0.0011	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0018	U	MG/KG	0.001	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0018	U	MG/KG	0.0011	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0018	U	MG/KG	0.0016	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0018	U	MG/KG	0.0015	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0018	U	MG/KG	0.001	0.0018	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0018	U	MG/KG	0.0006	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0018	U	MG/KG	0.0008	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0018	U	MG/KG	0.0006	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0018	U	MG/KG	0.001	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0018	U	MG/KG	0.0009	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0018	U	MG/KG	0.0008	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	78-93-3	2-Butanone	0.0049	J	MG/KG	0.0033	0.0045	Yes
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0046	U	MG/KG	0.0017	0.0046	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0046	U	MG/KG	0.0025	0.0046	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	67-64-1	Acetone	0.022	J	MG/KG	0.0031	0.023	Yes
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	71-43-2	Benzene	0.0018	U	MG/KG	0.0007	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0018	U	MG/KG	0.0006	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0018	U	MG/KG	0.0006	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	75-25-2	Bromoform	0.0018	U	MG/KG	0.0005	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	74-83-9	Bromomethane	0.0091	U	MG/KG	0.0016	0.0091	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.0091	U	MG/KG	0.0038	0.0091	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0018	U	MG/KG	0.0011	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0018	U	MG/KG	0.0009	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	75-00-3	Chloroethane	0.0018	U	MG/KG	0.001	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	67-66-3	Chloroform	0.0018	U	MG/KG	0.0008	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	74-87-3	Chloromethane	0.0018	U	MG/KG	0.0012	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0018	U	MG/KG	0.001	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0018	U	MG/KG	0.0005	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0018	U	MG/KG	0.001	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0018	U	MG/KG	0.0005	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0018	U	MG/KG	0.0011	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0018	U	MG/KG	0.001	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0018	U	MG/KG	0.001	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0036	U	MG/KG	0.0018	0.0036	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	79-20-9	Methyl acetate	0.0091	U	MG/KG	0.0029	0.0091	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0018	U	MG/KG	0.0009	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	75-09-2	Methylene chloride	0.0091	U	MG/KG	0.0013	0.0091	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0018	U	MG/KG	0.0005	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	95-47-6	o-Xylene	0.0018	U	MG/KG	0.0009	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	100-42-5	Styrene	0.0018	U	MG/KG	0.0008	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0018	U	MG/KG	0.0009	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	108-88-3	Toluene	0.0018	U	MG/KG	0.0008	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0018	U	MG/KG	0.0012	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0018	U	MG/KG	0.0006	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0018	U	MG/KG	0.0009	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0018	U	MG/KG	0.001	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0018	U	MG/KG	0.0008	0.0018	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-000H	0	0.5	5/15/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	32000	=	MG/KG	910	910	Yes
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.14	J	MG/KG	0.0016	0.0033	Yes
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.041	J	MG/KG	0.0017	0.0033	Yes
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.21	J	MG/KG	0.0022	0.0033	Yes
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	92-52-4	1,1-Biphenyl	0.16	UJ	MG/KG	0.16	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	95-94-3	1,2,4,5-Tetrachlorobenzene	0.16	UJ	MG/KG	0.11	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	108-60-1	2,2'-Oxybis(1-chloropropane)	0.16	UJ	MG/KG	0.13	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.33	UJ	MG/KG	0.12	0.33	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.16	UJ	MG/KG	0.095	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.16	UJ	MG/KG	0.098	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.16	UJ	MG/KG	0.12	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.16	UJ	MG/KG	0.12	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	0.49	UJ	MG/KG	0.2	0.49	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	121-14-2	2,4-Dinitrotoluene	0.16	UJ	MG/KG	0.12	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	606-20-2	2,6-Dinitrotoluene	0.16	UJ	MG/KG	0.11	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.16	UJ	MG/KG	0.13	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.16	UJ	MG/KG	0.11	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	88-74-4	2-Nitroaniline	0.16	UJ	MG/KG	0.11	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.16	UJ	MG/KG	0.13	0.16	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.33	UJ	MG/KG	0.26	0.33	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	91-94-1	3,3'-Dichlorobenzidine	0.16	UJ	MG/KG	0.15	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	99-09-2	3-Nitroaniline	0.16	UJ	MG/KG	0.12	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	0.49	UJ	MG/KG	0.21	0.49	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	101-55-3	4-Bromophenyl-phenylether	0.16	UJ	MG/KG	0.12	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.16	UJ	MG/KG	0.11	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	106-47-8	4-Chloroaniline	0.16	UJ	MG/KG	0.15	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	7005-72-3	4-Chlorophenyl-phenylether	0.16	UJ	MG/KG	0.11	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	100-01-6	4-Nitroaniline	0.16	UJ	MG/KG	0.13	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.16	UJ	MG/KG	0.13	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	98-86-2	Acetophenone	0.16	UJ	MG/KG	0.14	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	1912-24-9	Atrazine	0.16	UJ	MG/KG	0.12	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	100-52-7	Benzaldehyde	0.16	UJ	MG/KG	0.16	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	111-91-1	bis(2-Chloroethoxy)methane	0.16	UJ	MG/KG	0.11	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	111-44-4	bis(2-Chloroethyl)ether	0.16	UJ	MG/KG	0.15	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	117-81-7	bis(2-Ethylhexyl)phthalate	0.16	UJ	MG/KG	0.14	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	85-68-7	Butylbenzylphthalate	0.16	UJ	MG/KG	0.15	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	105-60-2	Caprolactam	0.33	UJ	MG/KG	0.16	0.33	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	86-74-8	Carbazole	0.16	UJ	MG/KG	0.11	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	132-64-9	Dibenzofuran	0.16	UJ	MG/KG	0.11	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	84-66-2	Diethylphthalate	0.16	UJ	MG/KG	0.12	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	131-11-3	Dimethyl phthalate	0.16	UJ	MG/KG	0.1	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	84-74-2	Di-n-butylphthalate	0.16	UJ	MG/KG	0.13	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	117-84-0	Di-n-octylphthalate	0.16	UJ	MG/KG	0.11	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	118-74-1	Hexachlorobenzene	0.16	UJ	MG/KG	0.13	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	87-68-3	Hexachlorobutadiene	0.16	UJ	MG/KG	0.13	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	77-47-4	Hexachlorocyclopentadiene	0.16	UJ	MG/KG	0.15	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	67-72-1	Hexachloroethane	0.16	UJ	MG/KG	0.12	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	78-59-1	Isophorone	0.16	UJ	MG/KG	0.12	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	98-95-3	Nitrobenzene	0.16	UJ	MG/KG	0.13	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	621-64-7	n-Nitroso-di-n-propylamine	0.16	UJ	MG/KG	0.15	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	86-30-6	n-Nitrosodiphenylamine	0.33	UJ	MG/KG	0.23	0.33	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	0.49	UJ	MG/KG	0.23	0.49	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	SVOA	108-95-2	Phenol	0.16	UJ	MG/KG	0.12	0.16	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0016	U	MG/KG	0.0006	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0016	U	MG/KG	0.0005	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0016	U	MG/KG	0.001	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0016	U	MG/KG	0.001	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0016	U	MG/KG	0.0009	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0016	U	MG/KG	0.001	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0016	U	MG/KG	0.0015	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0016	U	MG/KG	0.0014	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0016	U	MG/KG	0.0009	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0016	U	MG/KG	0.0005	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0016	U	MG/KG	0.0007	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0016	U	MG/KG	0.0005	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0016	U	MG/KG	0.0009	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0016	U	MG/KG	0.0008	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0016	U	MG/KG	0.0007	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	78-93-3	2-Butanone	0.0053	J	MG/KG	0.003	0.0041	Yes
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0041	U	MG/KG	0.0015	0.0041	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0041	U	MG/KG	0.0023	0.0041	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	67-64-1	Acetone	0.026	J	MG/KG	0.0028	0.021	Yes
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	71-43-2	Benzene	0.0016	U	MG/KG	0.0007	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0016	U	MG/KG	0.0006	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0016	U	MG/KG	0.0006	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	75-25-2	Bromoform	0.0016	U	MG/KG	0.0005	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	74-83-9	Bromomethane	0.0082	U	MG/KG	0.0015	0.0082	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.0082	U	MG/KG	0.0034	0.0082	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0016	U	MG/KG	0.001	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0016	U	MG/KG	0.0008	0.0016	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	75-00-3	Chloroethane	0.0016	U	MG/KG	0.0009	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	67-66-3	Chloroform	0.0016	U	MG/KG	0.0007	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	74-87-3	Chloromethane	0.0016	U	MG/KG	0.0011	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0016	U	MG/KG	0.0009	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0016	U	MG/KG	0.0005	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0016	U	MG/KG	0.0009	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0016	U	MG/KG	0.0004	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0016	U	MG/KG	0.001	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0016	U	MG/KG	0.0009	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0016	U	MG/KG	0.0009	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0033	U	MG/KG	0.0016	0.0033	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	79-20-9	Methyl acetate	0.0082	U	MG/KG	0.0026	0.0082	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0016	U	MG/KG	0.0009	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	75-09-2	Methylene chloride	0.0082	U	MG/KG	0.0011	0.0082	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0016	U	MG/KG	0.0004	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	95-47-6	o-Xylene	0.0016	U	MG/KG	0.0009	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	100-42-5	Styrene	0.0016	U	MG/KG	0.0007	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0016	U	MG/KG	0.0008	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	108-88-3	Toluene	0.0016	U	MG/KG	0.0008	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0016	U	MG/KG	0.0011	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0016	U	MG/KG	0.0005	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0016	U	MG/KG	0.0008	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0016	U	MG/KG	0.0009	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0016	U	MG/KG	0.0007	0.0016	No
VENO-SD01	2004546.22	246770.768	VENO-SD01-0H01	0.5	1	5/15/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	22000	=	MG/KG	820	820	Yes
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.0071	J	MG/KG	0.001	0.0021	Yes
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.017	J	MG/KG	0.0011	0.0021	Yes
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0037	J	MG/KG	0.0014	0.0021	Yes
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	92-52-4	1,1-Biphenyl	0.21	UJ	MG/KG	0.2	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	95-94-3	1,2,4,5-Tetrachlorobenzene	0.21	UJ	MG/KG	0.15	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	108-60-1	2,2'-Oxybis(1-chloropropane)	0.21	UJ	MG/KG	0.17	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.43	UJ	MG/KG	0.16	0.43	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.21	UJ	MG/KG	0.12	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.21	UJ	MG/KG	0.13	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.21	UJ	MG/KG	0.15	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.21	UJ	MG/KG	0.16	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	0.64	UJ	MG/KG	0.26	0.64	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	121-14-2	2,4-Dinitrotoluene	0.21	UJ	MG/KG	0.15	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	606-20-2	2,6-Dinitrotoluene	0.21	UJ	MG/KG	0.15	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.21	UJ	MG/KG	0.17	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.21	UJ	MG/KG	0.15	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	88-74-4	2-Nitroaniline	0.21	UJ	MG/KG	0.14	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.21	UJ	MG/KG	0.17	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.43	UJ	MG/KG	0.34	0.43	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	91-94-1	3,3'-Dichlorobenzidine	0.21	UJ	MG/KG	0.19	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	99-09-2	3-Nitroaniline	0.21	UJ	MG/KG	0.16	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	0.64	UJ	MG/KG	0.28	0.64	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	101-55-3	4-Bromophenyl-phenylether	0.21	UJ	MG/KG	0.16	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.21	UJ	MG/KG	0.14	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	106-47-8	4-Chloroaniline	0.21	UJ	MG/KG	0.2	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	7005-72-3	4-Chlorophenyl-phenylether	0.21	UJ	MG/KG	0.14	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	100-01-6	4-Nitroaniline	0.21	UJ	MG/KG	0.17	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.21	UJ	MG/KG	0.17	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	98-86-2	Acetophenone	0.21	UJ	MG/KG	0.18	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	1912-24-9	Atrazine	0.21	UJ	MG/KG	0.16	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	100-52-7	Benzaldehyde	0.21	UJ	MG/KG	0.21	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	111-91-1	bis(2-Chloroethoxy)methane	0.21	UJ	MG/KG	0.14	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	111-44-4	bis(2-Chloroethyl)ether	0.21	UJ	MG/KG	0.2	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	117-81-7	bis(2-Ethylhexyl)phthalate	0.21	UJ	MG/KG	0.18	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	85-68-7	Butylbenzylphthalate	0.21	UJ	MG/KG	0.2	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	105-60-2	Caprolactam	0.43	UJ	MG/KG	0.21	0.43	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	86-74-8	Carbazole	0.21	UJ	MG/KG	0.14	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	132-64-9	Dibenzofuran	0.21	UJ	MG/KG	0.14	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	84-66-2	Diethylphthalate	0.21	UJ	MG/KG	0.16	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	131-11-3	Dimethyl phthalate	0.21	UJ	MG/KG	0.13	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	84-74-2	Di-n-butylphthalate	0.21	UJ	MG/KG	0.17	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	117-84-0	Di-n-octylphthalate	0.21	UJ	MG/KG	0.14	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	118-74-1	Hexachlorobenzene	0.21	UJ	MG/KG	0.17	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	87-68-3	Hexachlorobutadiene	0.21	UJ	MG/KG	0.17	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	77-47-4	Hexachlorocyclopentadiene	0.21	UJ	MG/KG	0.2	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	67-72-1	Hexachloroethane	0.21	UJ	MG/KG	0.16	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	78-59-1	Isophorone	0.21	UJ	MG/KG	0.15	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	98-95-3	Nitrobenzene	0.21	UJ	MG/KG	0.17	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	621-64-7	n-Nitroso-di-n-propylamine	0.21	UJ	MG/KG	0.19	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	86-30-6	n-Nitrosodiphenylamine	0.43	UJ	MG/KG	0.3	0.43	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	0.64	UJ	MG/KG	0.3	0.64	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	SVOA	108-95-2	Phenol	0.21	UJ	MG/KG	0.16	0.21	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0025	UJ	MG/KG	0.0009	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0025	UJ	MG/KG	0.0008	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0025	UJ	MG/KG	0.0015	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0025	UJ	MG/KG	0.0015	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0025	UJ	MG/KG	0.0014	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0025	UJ	MG/KG	0.0016	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0025	UJ	MG/KG	0.0023	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0025	UJ	MG/KG	0.0022	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0025	UJ	MG/KG	0.0014	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0025	UJ	MG/KG	0.0008	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0025	UJ	MG/KG	0.0011	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0025	UJ	MG/KG	0.0008	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0025	UJ	MG/KG	0.0014	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0025	UJ	MG/KG	0.0012	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0025	UJ	MG/KG	0.0011	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	78-93-3	2-Butanone	0.048	J	MG/KG	0.0046	0.0063	Yes
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0063	UJ	MG/KG	0.0023	0.0063	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0063	UJ	MG/KG	0.0036	0.0063	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	67-64-1	Acetone	0.14	J	MG/KG	0.0043	0.032	Yes
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	71-43-2	Benzene	0.0025	UJ	MG/KG	0.001	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0025	UJ	MG/KG	0.0009	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0025	UJ	MG/KG	0.0009	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	75-25-2	Bromoform	0.0025	UJ	MG/KG	0.0008	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	74-83-9	Bromomethane	0.013	UJ	MG/KG	0.0023	0.013	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.013	UJ	MG/KG	0.0053	0.013	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0025	UJ	MG/KG	0.0015	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0025	UJ	MG/KG	0.0012	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	75-00-3	Chloroethane	0.0025	UJ	MG/KG	0.0014	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	67-66-3	Chloroform	0.0025	UJ	MG/KG	0.0011	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	74-87-3	Chloromethane	0.0025	UJ	MG/KG	0.0016	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0025	UJ	MG/KG	0.0013	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0025	UJ	MG/KG	0.0008	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0025	UJ	MG/KG	0.0013	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0025	UJ	MG/KG	0.0007	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0025	UJ	MG/KG	0.0016	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0025	UJ	MG/KG	0.0014	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0025	UJ	MG/KG	0.0014	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0051	UJ	MG/KG	0.0025	0.0051	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	79-20-9	Methyl acetate	0.013	UJ	MG/KG	0.0041	0.013	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0025	UJ	MG/KG	0.0013	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	75-09-2	Methylene chloride	0.013	UJ	MG/KG	0.0018	0.013	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0025	UJ	MG/KG	0.0007	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	95-47-6	o-Xylene	0.0025	UJ	MG/KG	0.0013	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	100-42-5	Styrene	0.0025	UJ	MG/KG	0.0011	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0025	UJ	MG/KG	0.0012	0.0025	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	108-88-3	Toluene	0.0025	UJ	MG/KG	0.0012	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0025	UJ	MG/KG	0.0018	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0025	UJ	MG/KG	0.0008	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0025	UJ	MG/KG	0.0013	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0025	UJ	MG/KG	0.0014	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0025	UJ	MG/KG	0.0011	0.0025	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-000H	0	0.5	5/15/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	48000	=	MG/KG	1100	1100	Yes
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.0036	UJ	MG/KG	0.0017	0.0036	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.014	J	MG/KG	0.0019	0.0036	Yes
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0036	UJ	MG/KG	0.0024	0.0036	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	92-52-4	1,1-Biphenyl	0.18	UJ	MG/KG	0.17	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	95-94-3	1,2,4,5-Tetrachlorobenzene	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	108-60-1	2,2'-Oxybis(1-chloropropane)	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.36	UJ	MG/KG	0.13	0.36	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.18	UJ	MG/KG	0.11	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.18	UJ	MG/KG	0.11	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	0.55	UJ	MG/KG	0.22	0.55	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	121-14-2	2,4-Dinitrotoluene	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	606-20-2	2,6-Dinitrotoluene	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	88-74-4	2-Nitroaniline	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.18	UJ	MG/KG	0.14	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.36	UJ	MG/KG	0.29	0.36	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	91-94-1	3,3'-Dichlorobenzidine	0.18	UJ	MG/KG	0.17	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	99-09-2	3-Nitroaniline	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	0.55	UJ	MG/KG	0.24	0.55	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	101-55-3	4-Bromophenyl-phenylether	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	106-47-8	4-Chloroaniline	0.18	UJ	MG/KG	0.17	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	7005-72-3	4-Chlorophenyl-phenylether	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	100-01-6	4-Nitroaniline	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	98-86-2	Acetophenone	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	1912-24-9	Atrazine	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	100-52-7	Benzaldehyde	0.18	UJ	MG/KG	0.18	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	111-91-1	bis(2-Chloroethoxy)methane	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	111-44-4	bis(2-Chloroethyl)ether	0.18	UJ	MG/KG	0.17	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	117-81-7	bis(2-Ethylhexyl)phthalate	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	85-68-7	Butylbenzylphthalate	0.18	UJ	MG/KG	0.17	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	105-60-2	Caprolactam	0.36	UJ	MG/KG	0.18	0.36	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	86-74-8	Carbazole	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	132-64-9	Dibenzofuran	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	84-66-2	Diethylphthalate	0.18	UJ	MG/KG	0.14	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	131-11-3	Dimethyl phthalate	0.18	UJ	MG/KG	0.11	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	84-74-2	Di-n-butylphthalate	0.18	UJ	MG/KG	0.14	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	117-84-0	Di-n-octylphthalate	0.18	UJ	MG/KG	0.12	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	118-74-1	Hexachlorobenzene	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	87-68-3	Hexachlorobutadiene	0.18	UJ	MG/KG	0.15	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	77-47-4	Hexachlorocyclopentadiene	0.18	UJ	MG/KG	0.17	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	67-72-1	Hexachloroethane	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	78-59-1	Isophorone	0.18	UJ	MG/KG	0.13	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	98-95-3	Nitrobenzene	0.18	UJ	MG/KG	0.14	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	621-64-7	n-Nitroso-di-n-propylamine	0.18	UJ	MG/KG	0.16	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	86-30-6	n-Nitrosodiphenylamine	0.36	UJ	MG/KG	0.25	0.36	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	0.55	UJ	MG/KG	0.25	0.55	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	SVOA	108-95-2	Phenol	0.18	UJ	MG/KG	0.14	0.18	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0018	UJ	MG/KG	0.0006	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0018	UJ	MG/KG	0.0005	0.0018	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0018	UJ	MG/KG	0.0011	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0018	UJ	MG/KG	0.0011	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0018	UJ	MG/KG	0.001	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0018	UJ	MG/KG	0.0011	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0018	UJ	MG/KG	0.0017	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0018	UJ	MG/KG	0.0015	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0018	UJ	MG/KG	0.001	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0018	UJ	MG/KG	0.0006	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0018	UJ	MG/KG	0.0008	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0018	UJ	MG/KG	0.0006	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0018	UJ	MG/KG	0.001	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0018	UJ	MG/KG	0.0009	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0018	UJ	MG/KG	0.0008	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	78-93-3	2-Butanone	0.027	J	MG/KG	0.0033	0.0046	Yes
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0046	UJ	MG/KG	0.0017	0.0046	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0046	UJ	MG/KG	0.0025	0.0046	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	67-64-1	Acetone	0.1	J	MG/KG	0.0031	0.023	Yes
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	71-43-2	Benzene	0.0018	UJ	MG/KG	0.0007	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0018	UJ	MG/KG	0.0006	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0018	UJ	MG/KG	0.0006	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	75-25-2	Bromoform	0.0018	UJ	MG/KG	0.0005	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	74-83-9	Bromomethane	0.0091	UJ	MG/KG	0.0016	0.0091	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.0091	UJ	MG/KG	0.0038	0.0091	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0018	UJ	MG/KG	0.0011	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0018	UJ	MG/KG	0.0009	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	75-00-3	Chloroethane	0.0018	UJ	MG/KG	0.001	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	67-66-3	Chloroform	0.0018	UJ	MG/KG	0.0008	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	74-87-3	Chloromethane	0.0018	UJ	MG/KG	0.0012	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0018	UJ	MG/KG	0.001	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0018	UJ	MG/KG	0.0005	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0018	UJ	MG/KG	0.001	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0018	UJ	MG/KG	0.0005	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0018	UJ	MG/KG	0.0011	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0018	UJ	MG/KG	0.001	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0018	UJ	MG/KG	0.001	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0036	UJ	MG/KG	0.0018	0.0036	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	79-20-9	Methyl acetate	0.0091	UJ	MG/KG	0.0029	0.0091	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0018	UJ	MG/KG	0.0009	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	75-09-2	Methylene chloride	0.0091	UJ	MG/KG	0.0013	0.0091	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0018	UJ	MG/KG	0.0005	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	95-47-6	o-Xylene	0.0018	UJ	MG/KG	0.0009	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	100-42-5	Styrene	0.0018	UJ	MG/KG	0.0008	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0018	UJ	MG/KG	0.0009	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	108-88-3	Toluene	0.0018	UJ	MG/KG	0.0008	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0018	UJ	MG/KG	0.0013	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0018	UJ	MG/KG	0.0006	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0018	UJ	MG/KG	0.0009	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0018	UJ	MG/KG	0.001	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0018	UJ	MG/KG	0.0008	0.0018	No
VENO-SD02	2004496.803	246769.43	VENO-SD02-0H01	0.5	1	5/15/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	28000	=	MG/KG	910	910	Yes
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.076	J	MG/KG	0.0021	0.0043	Yes
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.017	J	MG/KG	0.0023	0.0043	Yes
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.054	J	MG/KG	0.0029	0.0043	Yes
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	92-52-4	1,1-Biphenyl	0.22	UJ	MG/KG	0.21	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	95-94-3	1,2,4,5-Tetrachlorobenzene	0.22	UJ	MG/KG	0.15	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	108-60-1	2,2'-Oxybis(1-chloropropane)	0.22	UJ	MG/KG	0.18	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.43	UJ	MG/KG	0.16	0.43	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.22	UJ	MG/KG	0.13	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.22	UJ	MG/KG	0.13	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.22	UJ	MG/KG	0.15	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.22	UJ	MG/KG	0.16	0.22	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	0.65	UJ	MG/KG	0.26	0.65	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	121-14-2	2,4-Dinitrotoluene	0.22	UJ	MG/KG	0.16	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	606-20-2	2,6-Dinitrotoluene	0.22	UJ	MG/KG	0.15	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.22	UJ	MG/KG	0.18	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.22	UJ	MG/KG	0.15	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	88-74-4	2-Nitroaniline	0.22	UJ	MG/KG	0.15	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.22	UJ	MG/KG	0.17	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.43	UJ	MG/KG	0.35	0.43	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	91-94-1	3,3'-Dichlorobenzidine	0.22	UJ	MG/KG	0.2	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	99-09-2	3-Nitroaniline	0.22	UJ	MG/KG	0.16	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	0.65	UJ	MG/KG	0.28	0.65	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	101-55-3	4-Bromophenyl-phenylether	0.22	UJ	MG/KG	0.16	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.22	UJ	MG/KG	0.15	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	106-47-8	4-Chloroaniline	0.22	UJ	MG/KG	0.2	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	7005-72-3	4-Chlorophenyl-phenylether	0.22	UJ	MG/KG	0.15	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	100-01-6	4-Nitroaniline	0.22	UJ	MG/KG	0.18	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.22	UJ	MG/KG	0.18	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	98-86-2	Acetophenone	0.22	UJ	MG/KG	0.18	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	1912-24-9	Atrazine	0.22	UJ	MG/KG	0.16	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	100-52-7	Benzaldehyde	0.22	UJ	MG/KG	0.21	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	111-91-1	bis(2-Chloroethoxy)methane	0.22	UJ	MG/KG	0.14	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	111-44-4	bis(2-Chloroethyl)ether	0.22	UJ	MG/KG	0.2	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	117-81-7	bis(2-Ethylhexyl)phthalate	0.22	UJ	MG/KG	0.18	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	85-68-7	Butylbenzylphthalate	0.22	UJ	MG/KG	0.2	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	105-60-2	Caprolactam	0.43	UJ	MG/KG	0.22	0.43	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	86-74-8	Carbazole	0.22	UJ	MG/KG	0.15	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	132-64-9	Dibenzofuran	0.22	UJ	MG/KG	0.14	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	84-66-2	Diethylphthalate	0.22	UJ	MG/KG	0.16	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	131-11-3	Dimethyl phthalate	0.22	UJ	MG/KG	0.13	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	84-74-2	Di-n-butylphthalate	0.22	UJ	MG/KG	0.17	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	117-84-0	Di-n-octylphthalate	0.22	UJ	MG/KG	0.15	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	118-74-1	Hexachlorobenzene	0.22	UJ	MG/KG	0.18	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	87-68-3	Hexachlorobutadiene	0.22	UJ	MG/KG	0.17	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	77-47-4	Hexachlorocyclopentadiene	0.22	UJ	MG/KG	0.2	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	67-72-1	Hexachloroethane	0.22	UJ	MG/KG	0.16	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	78-59-1	Isophorone	0.22	UJ	MG/KG	0.16	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	98-95-3	Nitrobenzene	0.22	UJ	MG/KG	0.17	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	621-64-7	n-Nitroso-di-n-propylamine	0.22	UJ	MG/KG	0.2	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	86-30-6	n-Nitrosodiphenylamine	0.43	UJ	MG/KG	0.3	0.43	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	0.65	UJ	MG/KG	0.3	0.65	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	SVOA	108-95-2	Phenol	0.22	UJ	MG/KG	0.16	0.22	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0022	UJ	MG/KG	0.0008	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0022	UJ	MG/KG	0.0007	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0022	UJ	MG/KG	0.0013	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0022	UJ	MG/KG	0.0013	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0022	UJ	MG/KG	0.0012	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0022	UJ	MG/KG	0.0013	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0022	UJ	MG/KG	0.002	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0022	UJ	MG/KG	0.0018	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0022	UJ	MG/KG	0.0012	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0022	UJ	MG/KG	0.0007	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0022	UJ	MG/KG	0.001	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0022	UJ	MG/KG	0.0007	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0022	UJ	MG/KG	0.0012	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0022	UJ	MG/KG	0.001	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0022	UJ	MG/KG	0.001	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	78-93-3	2-Butanone	0.023	J	MG/KG	0.0039	0.0054	Yes
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0054	UJ	MG/KG	0.002	0.0054	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0054	UJ	MG/KG	0.003	0.0054	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	67-64-1	Acetone	0.09	J	MG/KG	0.0037	0.027	Yes
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	71-43-2	Benzene	0.0022	UJ	MG/KG	0.0009	0.0022	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0022	UJ	MG/KG	0.0008	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0022	UJ	MG/KG	0.0008	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	75-25-2	Bromoform	0.0022	UJ	MG/KG	0.0007	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	74-83-9	Bromomethane	0.011	UJ	MG/KG	0.002	0.011	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.0084	J	MG/KG	0.0046	0.011	Yes
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0022	UJ	MG/KG	0.0013	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0022	UJ	MG/KG	0.001	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	75-00-3	Chloroethane	0.0022	UJ	MG/KG	0.0012	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	67-66-3	Chloroform	0.0022	UJ	MG/KG	0.0009	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	74-87-3	Chloromethane	0.0022	UJ	MG/KG	0.0014	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0022	UJ	MG/KG	0.0011	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0022	UJ	MG/KG	0.0007	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0022	UJ	MG/KG	0.0011	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0022	UJ	MG/KG	0.0006	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0022	UJ	MG/KG	0.0013	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0022	UJ	MG/KG	0.0012	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0022	UJ	MG/KG	0.0012	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0043	UJ	MG/KG	0.0021	0.0043	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	79-20-9	Methyl acetate	0.011	UJ	MG/KG	0.0035	0.011	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0022	UJ	MG/KG	0.0011	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	75-09-2	Methylene chloride	0.011	UJ	MG/KG	0.0015	0.011	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0022	UJ	MG/KG	0.0006	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	95-47-6	o-Xylene	0.0022	UJ	MG/KG	0.0011	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	100-42-5	Styrene	0.0022	UJ	MG/KG	0.001	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0022	UJ	MG/KG	0.0011	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	108-88-3	Toluene	0.0022	UJ	MG/KG	0.001	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0022	UJ	MG/KG	0.0015	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0022	UJ	MG/KG	0.0007	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0022	UJ	MG/KG	0.0011	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0022	UJ	MG/KG	0.0012	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0022	UJ	MG/KG	0.001	0.0022	No
VENO-SD03	2004410.978	246809.858	VENO-SD03-000H	0	0.5	5/15/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	47000	=	MG/KG	1100	1100	Yes
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.0083	J	MG/KG	0.004	0.0084	Yes
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.02	J	MG/KG	0.0044	0.0084	Yes
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0084	UJ	MG/KG	0.0055	0.0084	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.84	UJ	MG/KG	0.31	0.84	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.42	UJ	MG/KG	0.24	0.42	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.42	UJ	MG/KG	0.25	0.42	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.42	UJ	MG/KG	0.3	0.42	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.42	UJ	MG/KG	0.31	0.42	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	1.3	UJ	MG/KG	0.5	1.3	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.42	UJ	MG/KG	0.34	0.42	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.42	UJ	MG/KG	0.29	0.42	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.42	UJ	MG/KG	0.33	0.42	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.84	UJ	MG/KG	0.67	0.84	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	1.3	UJ	MG/KG	0.55	1.3	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.42	UJ	MG/KG	0.28	0.42	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.42	UJ	MG/KG	0.34	0.42	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	1.3	UJ	MG/KG	0.59	1.3	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	SVOA	108-95-2	Phenol	0.42	UJ	MG/KG	0.32	0.42	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0058	UJ	MG/KG	0.002	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0058	UJ	MG/KG	0.0017	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0058	UJ	MG/KG	0.0035	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0058	UJ	MG/KG	0.0035	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0058	UJ	MG/KG	0.0033	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0058	UJ	MG/KG	0.0036	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0058	UJ	MG/KG	0.0052	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0058	UJ	MG/KG	0.0049	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0058	UJ	MG/KG	0.0033	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0058	UJ	MG/KG	0.0018	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0058	UJ	MG/KG	0.0025	0.0058	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0058	UJ	MG/KG	0.0018	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0058	UJ	MG/KG	0.0032	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0058	UJ	MG/KG	0.0027	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0058	UJ	MG/KG	0.0026	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	78-93-3	2-Butanone	0.023	J	MG/KG	0.01	0.014	Yes
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	591-78-6	2-Hexanone	0.014	UJ	MG/KG	0.0052	0.014	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.014	UJ	MG/KG	0.0081	0.014	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	67-64-1	Acetone	0.12	J	MG/KG	0.0098	0.072	Yes
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	71-43-2	Benzene	0.0058	UJ	MG/KG	0.0023	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0058	UJ	MG/KG	0.002	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0058	UJ	MG/KG	0.002	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	75-25-2	Bromoform	0.0058	UJ	MG/KG	0.0017	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	74-83-9	Bromomethane	0.029	UJ	MG/KG	0.0052	0.029	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.051	J	MG/KG	0.012	0.029	Yes
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0058	UJ	MG/KG	0.0035	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0058	UJ	MG/KG	0.0028	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	75-00-3	Chloroethane	0.0058	UJ	MG/KG	0.0031	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	67-66-3	Chloroform	0.0058	UJ	MG/KG	0.0025	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	74-87-3	Chloromethane	0.0058	UJ	MG/KG	0.0037	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0058	UJ	MG/KG	0.0031	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0058	UJ	MG/KG	0.0017	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0058	UJ	MG/KG	0.0031	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0058	UJ	MG/KG	0.0015	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0058	UJ	MG/KG	0.0036	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0058	UJ	MG/KG	0.0032	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0058	UJ	MG/KG	0.0031	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.012	UJ	MG/KG	0.0057	0.012	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	79-20-9	Methyl acetate	0.029	UJ	MG/KG	0.0092	0.029	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0058	UJ	MG/KG	0.003	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	75-09-2	Methylene chloride	0.029	UJ	MG/KG	0.004	0.029	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0058	UJ	MG/KG	0.0016	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	95-47-6	o-Xylene	0.0058	UJ	MG/KG	0.003	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	100-42-5	Styrene	0.0058	UJ	MG/KG	0.0025	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0058	UJ	MG/KG	0.0028	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	108-88-3	Toluene	0.0058	UJ	MG/KG	0.0026	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0058	UJ	MG/KG	0.004	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0058	UJ	MG/KG	0.0018	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0058	UJ	MG/KG	0.0029	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0058	UJ	MG/KG	0.0031	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0058	UJ	MG/KG	0.0025	0.0058	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-000H	0	0.5	5/17/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	100000	=	MG/KG	2100	2100	Yes
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.0063	UJ	MG/KG	0.003	0.0063	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.0063	UJ	MG/KG	0.0033	0.0063	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0063	UJ	MG/KG	0.0042	0.0063	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0038	UJ	MG/KG	0.0013	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0038	UJ	MG/KG	0.0011	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0038	UJ	MG/KG	0.0023	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0038	UJ	MG/KG	0.0023	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0038	UJ	MG/KG	0.0022	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0038	UJ	MG/KG	0.0024	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0038	UJ	MG/KG	0.0035	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0038	UJ	MG/KG	0.0032	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0038	UJ	MG/KG	0.0022	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0038	UJ	MG/KG	0.0012	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0038	UJ	MG/KG	0.0017	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0038	UJ	MG/KG	0.0012	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0038	UJ	MG/KG	0.0021	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0038	UJ	MG/KG	0.0018	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0038	UJ	MG/KG	0.0017	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	78-93-3	2-Butanone	0.013	J	MG/KG	0.0068	0.0095	Yes
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0095	UJ	MG/KG	0.0035	0.0095	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0095	UJ	MG/KG	0.0053	0.0095	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	67-64-1	Acetone	0.071	J	MG/KG	0.0065	0.048	Yes
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	71-43-2	Benzene	0.0038	UJ	MG/KG	0.0015	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0038	UJ	MG/KG	0.0013	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0038	UJ	MG/KG	0.0013	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	75-25-2	Bromoform	0.0038	UJ	MG/KG	0.0011	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	74-83-9	Bromomethane	0.019	UJ	MG/KG	0.0034	0.019	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.085	J	MG/KG	0.008	0.019	Yes
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0038	UJ	MG/KG	0.0023	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0038	UJ	MG/KG	0.0018	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	75-00-3	Chloroethane	0.0038	UJ	MG/KG	0.0021	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	67-66-3	Chloroform	0.0038	UJ	MG/KG	0.0016	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	74-87-3	Chloromethane	0.0038	UJ	MG/KG	0.0025	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0038	UJ	MG/KG	0.002	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0038	UJ	MG/KG	0.0011	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0038	UJ	MG/KG	0.002	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0038	UJ	MG/KG	0.001	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0038	UJ	MG/KG	0.0024	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0038	UJ	MG/KG	0.0021	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0038	UJ	MG/KG	0.0021	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0076	UJ	MG/KG	0.0038	0.0076	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	79-20-9	Methyl acetate	0.019	UJ	MG/KG	0.0061	0.019	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0038	UJ	MG/KG	0.002	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	75-09-2	Methylene chloride	0.019	UJ	MG/KG	0.0026	0.019	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0038	UJ	MG/KG	0.001	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	95-47-6	o-Xylene	0.0038	UJ	MG/KG	0.002	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	100-42-5	Styrene	0.0038	UJ	MG/KG	0.0017	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0038	UJ	MG/KG	0.0019	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	108-88-3	Toluene	0.0038	UJ	MG/KG	0.0017	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0038	UJ	MG/KG	0.0026	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0038	UJ	MG/KG	0.0012	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0038	UJ	MG/KG	0.0019	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0038	UJ	MG/KG	0.0021	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0038	UJ	MG/KG	0.0017	0.0038	No
VENO-SD04	2004392.806	246878.188	VENO-SD04-0H01	0.5	1	5/17/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	67000	=	MG/KG	1600	1600	Yes
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.0072	J	MG/KG	0.0035	0.0072	Yes
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.0072	UJ	MG/KG	0.0037	0.0072	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0072	UJ	MG/KG	0.0047	0.0072	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.005	UJ	MG/KG	0.0018	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.005	UJ	MG/KG	0.0015	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.005	UJ	MG/KG	0.003	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.005	UJ	MG/KG	0.003	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.005	UJ	MG/KG	0.0029	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.005	UJ	MG/KG	0.0031	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.005	UJ	MG/KG	0.0046	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.005	UJ	MG/KG	0.0043	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.005	UJ	MG/KG	0.0029	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.005	UJ	MG/KG	0.0016	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.005	UJ	MG/KG	0.0022	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.005	UJ	MG/KG	0.0016	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.005	UJ	MG/KG	0.0028	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.005	UJ	MG/KG	0.0024	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.005	UJ	MG/KG	0.0023	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	78-93-3	2-Butanone	0.025	J	MG/KG	0.0091	0.013	Yes
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	591-78-6	2-Hexanone	0.013	UJ	MG/KG	0.0046	0.013	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.013	UJ	MG/KG	0.007	0.013	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	67-64-1	Acetone	0.13	J	MG/KG	0.0086	0.063	Yes
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	71-43-2	Benzene	0.005	UJ	MG/KG	0.002	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.005	UJ	MG/KG	0.0018	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.005	UJ	MG/KG	0.0018	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	75-25-2	Bromoform	0.005	UJ	MG/KG	0.0015	0.005	No

Attachment C-6

Analytical Data Used in the HHRA

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	74-83-9	Bromomethane	0.025	UJ	MG/KG	0.0045	0.025	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.016	J	MG/KG	0.011	0.025	Yes
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.005	UJ	MG/KG	0.003	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.005	UJ	MG/KG	0.0024	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	75-00-3	Chloroethane	0.005	UJ	MG/KG	0.0027	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	67-66-3	Chloroform	0.005	UJ	MG/KG	0.0022	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	74-87-3	Chloromethane	0.005	UJ	MG/KG	0.0033	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.005	UJ	MG/KG	0.0027	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.005	UJ	MG/KG	0.0015	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	110-82-7	Cyclohexane	0.005	UJ	MG/KG	0.0027	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.005	UJ	MG/KG	0.0013	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.005	UJ	MG/KG	0.0031	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.005	UJ	MG/KG	0.0028	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.005	UJ	MG/KG	0.0027	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.01	UJ	MG/KG	0.005	0.01	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	79-20-9	Methyl acetate	0.025	UJ	MG/KG	0.0081	0.025	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.005	UJ	MG/KG	0.0026	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	75-09-2	Methylene chloride	0.025	UJ	MG/KG	0.0035	0.025	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.005	UJ	MG/KG	0.0014	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	95-47-6	o-Xylene	0.005	UJ	MG/KG	0.0026	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	100-42-5	Styrene	0.005	UJ	MG/KG	0.0022	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.005	UJ	MG/KG	0.0025	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	108-88-3	Toluene	0.005	UJ	MG/KG	0.0023	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.005	UJ	MG/KG	0.0035	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.005	UJ	MG/KG	0.0016	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	79-01-6	Trichloroethene	0.005	UJ	MG/KG	0.0025	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.005	UJ	MG/KG	0.0027	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.005	UJ	MG/KG	0.0022	0.005	No
VENO-SD05	2004397.011	246886.304	VENO-SD05-000H	0	0.5	5/17/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	47000	=	MG/KG	1800	1800	Yes
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.15	J	MG/KG	0.0026	0.0054	Yes
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.014	J	MG/KG	0.0028	0.0054	Yes
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0054	UJ	MG/KG	0.0036	0.0054	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0039	UJ	MG/KG	0.0014	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0039	UJ	MG/KG	0.0012	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0039	UJ	MG/KG	0.0023	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0039	UJ	MG/KG	0.0023	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0039	UJ	MG/KG	0.0022	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0039	UJ	MG/KG	0.0024	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0039	UJ	MG/KG	0.0036	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0039	UJ	MG/KG	0.0033	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0039	UJ	MG/KG	0.0022	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0039	UJ	MG/KG	0.0012	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0039	UJ	MG/KG	0.0017	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0039	UJ	MG/KG	0.0013	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0039	UJ	MG/KG	0.0022	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0039	UJ	MG/KG	0.0018	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0039	UJ	MG/KG	0.0018	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	78-93-3	2-Butanone	0.056	J	MG/KG	0.007	0.0098	Yes
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0098	UJ	MG/KG	0.0036	0.0098	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0098	UJ	MG/KG	0.0055	0.0098	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	67-64-1	Acetone	0.24	J	MG/KG	0.0067	0.049	Yes
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	71-43-2	Benzene	0.0039	UJ	MG/KG	0.0016	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0039	UJ	MG/KG	0.0014	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0039	UJ	MG/KG	0.0014	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	75-25-2	Bromoform	0.0039	UJ	MG/KG	0.0012	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	74-83-9	Bromomethane	0.02	UJ	MG/KG	0.0035	0.02	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.02	J	MG/KG	0.0082	0.02	Yes
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0039	UJ	MG/KG	0.0023	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0039	UJ	MG/KG	0.0019	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	75-00-3	Chloroethane	0.0039	UJ	MG/KG	0.0021	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	67-66-3	Chloroform	0.0039	UJ	MG/KG	0.0017	0.0039	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	74-87-3	Chloromethane	0.0039	UJ	MG/KG	0.0025	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0039	UJ	MG/KG	0.0021	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0039	UJ	MG/KG	0.0012	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0039	UJ	MG/KG	0.0021	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0039	UJ	MG/KG	0.001	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0039	UJ	MG/KG	0.0024	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0039	UJ	MG/KG	0.0022	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0039	UJ	MG/KG	0.0021	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0078	UJ	MG/KG	0.0039	0.0078	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	79-20-9	Methyl acetate	0.02	UJ	MG/KG	0.0063	0.02	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0039	UJ	MG/KG	0.002	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	75-09-2	Methylene chloride	0.02	UJ	MG/KG	0.0027	0.02	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0039	UJ	MG/KG	0.0011	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	95-47-6	o-Xylene	0.0039	UJ	MG/KG	0.002	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	100-42-5	Styrene	0.0039	UJ	MG/KG	0.0017	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0039	UJ	MG/KG	0.0019	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	108-88-3	Toluene	0.0039	UJ	MG/KG	0.0018	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0039	UJ	MG/KG	0.0027	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0039	UJ	MG/KG	0.0012	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0039	UJ	MG/KG	0.002	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0039	UJ	MG/KG	0.0021	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0039	UJ	MG/KG	0.0017	0.0039	No
VENO-SD06	2004353.866	246914.877	VENO-SD06-000H	0	0.5	5/17/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	38000	=	MG/KG	1400	1400	Yes
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.0026	J	MG/KG	0.0013	0.0026	Yes
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.0026	UJ	MG/KG	0.0014	0.0026	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0026	UJ	MG/KG	0.0017	0.0026	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	92-52-4	1,1-Biphenyl	0.13	U	MG/KG	0.12	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	95-94-3	1,2,4,5-Tetrachlorobenzene	0.13	U	MG/KG	0.091	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	108-60-1	2,2'-Oxybis(1-chloropropane)	0.13	U	MG/KG	0.11	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.26	U	MG/KG	0.097	0.26	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.13	U	MG/KG	0.076	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.13	U	MG/KG	0.079	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.13	U	MG/KG	0.093	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.13	U	MG/KG	0.097	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	0.4	UJ	MG/KG	0.16	0.4	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	121-14-2	2,4-Dinitrotoluene	0.13	UJ	MG/KG	0.095	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	606-20-2	2,6-Dinitrotoluene	0.13	U	MG/KG	0.091	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.13	U	MG/KG	0.11	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.13	U	MG/KG	0.092	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	88-74-4	2-Nitroaniline	0.13	U	MG/KG	0.088	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.13	U	MG/KG	0.1	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.26	U	MG/KG	0.21	0.26	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	91-94-1	3,3'-Dichlorobenzidine	0.13	U	MG/KG	0.12	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	99-09-2	3-Nitroaniline	0.13	U	MG/KG	0.097	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	0.4	UJ	MG/KG	0.17	0.4	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	101-55-3	4-Bromophenyl-phenylether	0.13	U	MG/KG	0.096	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.13	U	MG/KG	0.088	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	106-47-8	4-Chloroaniline	0.13	U	MG/KG	0.12	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	7005-72-3	4-Chlorophenyl-phenylether	0.13	U	MG/KG	0.088	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	100-01-6	4-Nitroaniline	0.13	UJ	MG/KG	0.11	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.13	UJ	MG/KG	0.11	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	98-86-2	Acetophenone	0.13	U	MG/KG	0.11	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	1912-24-9	Atrazine	0.13	U	MG/KG	0.097	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	100-52-7	Benzaldehyde	0.13	U	MG/KG	0.13	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	111-91-1	bis(2-Chloroethoxy)methane	0.13	U	MG/KG	0.084	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	111-44-4	bis(2-Chloroethyl)ether	0.13	U	MG/KG	0.12	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	117-81-7	bis(2-Ethylhexyl)phthalate	0.13	U	MG/KG	0.11	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	85-68-7	Butylbenzylphthalate	0.13	UJ	MG/KG	0.12	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	105-60-2	Caprolactam	0.26	U	MG/KG	0.13	0.26	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	86-74-8	Carbazole	0.13	U	MG/KG	0.089	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	132-64-9	Dibenzofuran	0.13	U	MG/KG	0.087	0.13	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	84-66-2	Diethylphthalate	0.13	U	MG/KG	0.098	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	131-11-3	Dimethyl phthalate	0.13	U	MG/KG	0.081	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	84-74-2	Di-n-butylphthalate	0.13	U	MG/KG	0.1	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	117-84-0	Di-n-octylphthalate	0.13	U	MG/KG	0.088	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	118-74-1	Hexachlorobenzene	0.13	U	MG/KG	0.11	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	87-68-3	Hexachlorobutadiene	0.13	U	MG/KG	0.11	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	77-47-4	Hexachlorocyclopentadiene	0.13	U	MG/KG	0.12	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	67-72-1	Hexachloroethane	0.13	U	MG/KG	0.097	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	78-59-1	Isophorone	0.13	U	MG/KG	0.095	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	98-95-3	Nitrobenzene	0.13	U	MG/KG	0.1	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	621-64-7	n-Nitroso-di-n-propylamine	0.13	U	MG/KG	0.12	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	86-30-6	n-Nitrosodiphenylamine	0.26	U	MG/KG	0.18	0.26	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	0.4	U	MG/KG	0.18	0.4	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	SVOA	108-95-2	Phenol	0.13	U	MG/KG	0.1	0.13	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0013	U	MG/KG	0.0005	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0013	U	MG/KG	0.0004	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0013	U	MG/KG	0.0008	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0013	U	MG/KG	0.0008	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0013	U	MG/KG	0.0007	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0013	U	MG/KG	0.0008	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0013	U	MG/KG	0.0012	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0013	U	MG/KG	0.0011	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0013	U	MG/KG	0.0007	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0013	U	MG/KG	0.0004	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0013	U	MG/KG	0.0006	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0013	U	MG/KG	0.0004	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0013	U	MG/KG	0.0007	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0013	U	MG/KG	0.0006	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0013	U	MG/KG	0.0006	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	78-93-3	2-Butanone	0.0033	U	MG/KG	0.0024	0.0033	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0033	U	MG/KG	0.0012	0.0033	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0033	U	MG/KG	0.0018	0.0033	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	67-64-1	Acetone	0.0081	J	MG/KG	0.0022	0.016	Yes
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	71-43-2	Benzene	0.0013	U	MG/KG	0.0005	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0013	U	MG/KG	0.0005	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0013	U	MG/KG	0.0005	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	75-25-2	Bromoform	0.0013	U	MG/KG	0.0004	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	74-83-9	Bromomethane	0.0066	U	MG/KG	0.0012	0.0066	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.0048	J	MG/KG	0.0023	0.0055	Yes
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0013	U	MG/KG	0.0008	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0013	U	MG/KG	0.0006	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	75-00-3	Chloroethane	0.0013	U	MG/KG	0.0007	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	67-66-3	Chloroform	0.0013	U	MG/KG	0.0006	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	74-87-3	Chloromethane	0.0013	U	MG/KG	0.0009	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0013	U	MG/KG	0.0007	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0013	U	MG/KG	0.0004	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0013	U	MG/KG	0.0007	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0013	U	MG/KG	0.0003	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0013	U	MG/KG	0.0008	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0013	U	MG/KG	0.0007	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0013	U	MG/KG	0.0007	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0026	U	MG/KG	0.0013	0.0026	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	79-20-9	Methyl acetate	0.0066	U	MG/KG	0.0021	0.0066	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0013	U	MG/KG	0.0007	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	75-09-2	Methylene chloride	0.0066	U	MG/KG	0.0009	0.0066	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0013	U	MG/KG	0.0004	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	95-47-6	o-Xylene	0.0013	U	MG/KG	0.0007	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	100-42-5	Styrene	0.0013	U	MG/KG	0.0006	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0013	U	MG/KG	0.0006	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	108-88-3	Toluene	0.0013	U	MG/KG	0.0006	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0013	U	MG/KG	0.0009	0.0013	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0013	U	MG/KG	0.0004	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0013	U	MG/KG	0.0007	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0013	U	MG/KG	0.0007	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0013	U	MG/KG	0.0006	0.0013	No
VENO-SD07	2004288.043	246939.426	VENO-SD07-000H	0	0.5	5/17/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	4500	=	MG/KG	660	660	Yes
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.0058	UJ	MG/KG	0.0028	0.0058	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.0058	UJ	MG/KG	0.003	0.0058	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0058	UJ	MG/KG	0.0038	0.0058	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	92-52-4	1,1-Biphenyl	0.29	UJ	MG/KG	0.27	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	95-94-3	1,2,4,5-Tetrachlorobenzene	0.29	UJ	MG/KG	0.2	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	108-60-1	2,2'-Oxybis(1-chloropropane)	0.29	UJ	MG/KG	0.24	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.58	UJ	MG/KG	0.21	0.58	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.29	UJ	MG/KG	0.17	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.29	UJ	MG/KG	0.17	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.29	UJ	MG/KG	0.2	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.29	UJ	MG/KG	0.21	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	0.87	UJ	MG/KG	0.35	0.87	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	121-14-2	2,4-Dinitrotoluene	0.29	UJ	MG/KG	0.21	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	606-20-2	2,6-Dinitrotoluene	0.29	UJ	MG/KG	0.2	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.29	UJ	MG/KG	0.24	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.29	UJ	MG/KG	0.2	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	88-74-4	2-Nitroaniline	0.29	UJ	MG/KG	0.19	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.29	UJ	MG/KG	0.23	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.58	UJ	MG/KG	0.46	0.58	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	91-94-1	3,3'-Dichlorobenzidine	0.29	UJ	MG/KG	0.26	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	99-09-2	3-Nitroaniline	0.29	UJ	MG/KG	0.21	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	0.87	UJ	MG/KG	0.38	0.87	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	101-55-3	4-Bromophenyl-phenylether	0.29	UJ	MG/KG	0.21	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.29	UJ	MG/KG	0.19	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	106-47-8	4-Chloroaniline	0.29	UJ	MG/KG	0.27	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	7005-72-3	4-Chlorophenyl-phenylether	0.29	UJ	MG/KG	0.19	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	100-01-6	4-Nitroaniline	0.29	UJ	MG/KG	0.24	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.29	UJ	MG/KG	0.24	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	98-86-2	Acetophenone	0.29	UJ	MG/KG	0.24	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	1912-24-9	Atrazine	0.29	UJ	MG/KG	0.21	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	100-52-7	Benzaldehyde	0.29	UJ	MG/KG	0.29	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	111-91-1	bis(2-Chloroethoxy)methane	0.29	UJ	MG/KG	0.18	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	111-44-4	bis(2-Chloroethyl)ether	0.29	UJ	MG/KG	0.27	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	117-81-7	bis(2-Ethylhexyl)phthalate	0.29	UJ	MG/KG	0.25	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	85-68-7	Butylbenzylphthalate	0.29	UJ	MG/KG	0.27	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	105-60-2	Caprolactam	0.58	UJ	MG/KG	0.29	0.58	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	86-74-8	Carbazole	0.29	UJ	MG/KG	0.2	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	132-64-9	Dibenzofuran	0.29	UJ	MG/KG	0.19	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	84-66-2	Diethylphthalate	0.29	UJ	MG/KG	0.22	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	131-11-3	Dimethyl phthalate	0.29	UJ	MG/KG	0.18	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	84-74-2	Di-n-butylphthalate	0.29	UJ	MG/KG	0.23	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	117-84-0	Di-n-octylphthalate	0.29	UJ	MG/KG	0.19	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	118-74-1	Hexachlorobenzene	0.29	UJ	MG/KG	0.23	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	87-68-3	Hexachlorobutadiene	0.29	UJ	MG/KG	0.23	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	77-47-4	Hexachlorocyclopentadiene	0.29	UJ	MG/KG	0.27	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	67-72-1	Hexachloroethane	0.29	UJ	MG/KG	0.21	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	78-59-1	Isophorone	0.29	UJ	MG/KG	0.21	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	98-95-3	Nitrobenzene	0.29	UJ	MG/KG	0.23	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	621-64-7	n-Nitroso-di-n-propylamine	0.29	UJ	MG/KG	0.26	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	86-30-6	n-Nitrosodiphenylamine	0.58	UJ	MG/KG	0.4	0.58	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	0.87	UJ	MG/KG	0.4	0.87	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	SVOA	108-95-2	Phenol	0.29	UJ	MG/KG	0.22	0.29	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0036	UJ	MG/KG	0.0013	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0036	UJ	MG/KG	0.0011	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0036	UJ	MG/KG	0.0022	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0036	UJ	MG/KG	0.0022	0.0036	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0036	UJ	MG/KG	0.0021	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0036	UJ	MG/KG	0.0022	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0036	UJ	MG/KG	0.0033	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0036	UJ	MG/KG	0.0031	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0036	UJ	MG/KG	0.0021	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0036	UJ	MG/KG	0.0011	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0036	UJ	MG/KG	0.0016	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0036	UJ	MG/KG	0.0012	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0036	UJ	MG/KG	0.002	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0036	UJ	MG/KG	0.0017	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0036	UJ	MG/KG	0.0016	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	78-93-3	2-Butanone	0.017	J	MG/KG	0.0065	0.009	Yes
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	591-78-6	2-Hexanone	0.009	UJ	MG/KG	0.0033	0.009	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.009	UJ	MG/KG	0.005	0.009	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	67-64-1	Acetone	0.095	J	MG/KG	0.0061	0.045	Yes
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	71-43-2	Benzene	0.0036	UJ	MG/KG	0.0014	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0036	UJ	MG/KG	0.0013	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0036	UJ	MG/KG	0.0013	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	75-25-2	Bromoform	0.0036	UJ	MG/KG	0.0011	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	74-83-9	Bromomethane	0.018	UJ	MG/KG	0.0032	0.018	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.034	J	MG/KG	0.0076	0.018	Yes
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0036	UJ	MG/KG	0.0022	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0036	UJ	MG/KG	0.0017	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	75-00-3	Chloroethane	0.0036	UJ	MG/KG	0.0019	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	67-66-3	Chloroform	0.0036	UJ	MG/KG	0.0015	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	74-87-3	Chloromethane	0.0036	UJ	MG/KG	0.0023	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0036	UJ	MG/KG	0.0019	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0036	UJ	MG/KG	0.0011	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0036	UJ	MG/KG	0.0019	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0036	UJ	MG/KG	0.0009	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0036	UJ	MG/KG	0.0022	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0036	UJ	MG/KG	0.002	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0036	UJ	MG/KG	0.0019	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0072	UJ	MG/KG	0.0036	0.0072	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	79-20-9	Methyl acetate	0.018	UJ	MG/KG	0.0058	0.018	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0036	UJ	MG/KG	0.0019	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	75-09-2	Methylene chloride	0.018	UJ	MG/KG	0.0025	0.018	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0036	UJ	MG/KG	0.001	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	95-47-6	o-Xylene	0.0036	UJ	MG/KG	0.0019	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	100-42-5	Styrene	0.0036	UJ	MG/KG	0.0016	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0036	UJ	MG/KG	0.0018	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	108-88-3	Toluene	0.0036	UJ	MG/KG	0.0017	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0036	UJ	MG/KG	0.0025	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0036	UJ	MG/KG	0.0011	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0036	UJ	MG/KG	0.0018	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0036	UJ	MG/KG	0.0019	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0036	UJ	MG/KG	0.0016	0.0036	No
VENO-SD08	2004501.232	246891.513	VENO-SD08-000H	0	0.5	5/16/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	70000	=	MG/KG	1400	1400	Yes
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.0047	UJ	MG/KG	0.0022	0.0047	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.0047	UJ	MG/KG	0.0024	0.0047	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0047	UJ	MG/KG	0.0031	0.0047	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	92-52-4	1,1-Biphenyl	0.23	UJ	MG/KG	0.22	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	95-94-3	1,2,4,5-Tetrachlorobenzene	0.23	UJ	MG/KG	0.16	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	108-60-1	2,2'-Oxybis(1-chloropropane)	0.23	UJ	MG/KG	0.19	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.47	UJ	MG/KG	0.17	0.47	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.23	UJ	MG/KG	0.14	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.23	UJ	MG/KG	0.14	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.23	UJ	MG/KG	0.17	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.23	UJ	MG/KG	0.17	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	0.7	UJ	MG/KG	0.28	0.7	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	121-14-2	2,4-Dinitrotoluene	0.23	UJ	MG/KG	0.17	0.23	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	606-20-2	2,6-Dinitrotoluene	0.23	UJ	MG/KG	0.16	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.23	UJ	MG/KG	0.19	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.23	UJ	MG/KG	0.16	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	88-74-4	2-Nitroaniline	0.23	UJ	MG/KG	0.16	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.23	UJ	MG/KG	0.18	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.47	UJ	MG/KG	0.37	0.47	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	91-94-1	3,3'-Dichlorobenzidine	0.23	UJ	MG/KG	0.21	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	99-09-2	3-Nitroaniline	0.23	UJ	MG/KG	0.17	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	0.7	UJ	MG/KG	0.3	0.7	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	101-55-3	4-Bromophenyl-phenylether	0.23	UJ	MG/KG	0.17	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.23	UJ	MG/KG	0.16	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	106-47-8	4-Chloroaniline	0.23	UJ	MG/KG	0.21	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	7005-72-3	4-Chlorophenyl-phenylether	0.23	UJ	MG/KG	0.16	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	100-01-6	4-Nitroaniline	0.23	UJ	MG/KG	0.19	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.23	UJ	MG/KG	0.19	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	98-86-2	Acetophenone	0.23	UJ	MG/KG	0.19	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	1912-24-9	Atrazine	0.23	UJ	MG/KG	0.17	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	100-52-7	Benzaldehyde	0.23	UJ	MG/KG	0.23	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	111-91-1	bis(2-Chloroethoxy)methane	0.23	UJ	MG/KG	0.15	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	111-44-4	bis(2-Chloroethyl)ether	0.23	UJ	MG/KG	0.21	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	117-81-7	bis(2-Ethylhexyl)phthalate	0.23	UJ	MG/KG	0.2	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	85-68-7	Butylbenzylphthalate	0.23	UJ	MG/KG	0.22	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	105-60-2	Caprolactam	0.47	UJ	MG/KG	0.23	0.47	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	86-74-8	Carbazole	0.23	UJ	MG/KG	0.16	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	132-64-9	Dibenzofuran	0.23	UJ	MG/KG	0.15	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	84-66-2	Diethylphthalate	0.23	UJ	MG/KG	0.18	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	131-11-3	Dimethyl phthalate	0.23	UJ	MG/KG	0.14	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	84-74-2	Di-n-butylphthalate	0.23	UJ	MG/KG	0.18	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	117-84-0	Di-n-octylphthalate	0.23	UJ	MG/KG	0.16	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	118-74-1	Hexachlorobenzene	0.23	UJ	MG/KG	0.19	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	87-68-3	Hexachlorobutadiene	0.23	UJ	MG/KG	0.19	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	77-47-4	Hexachlorocyclopentadiene	0.23	UJ	MG/KG	0.22	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	67-72-1	Hexachloroethane	0.23	UJ	MG/KG	0.17	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	78-59-1	Isophorone	0.23	UJ	MG/KG	0.17	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	98-95-3	Nitrobenzene	0.23	UJ	MG/KG	0.18	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	621-64-7	n-Nitroso-di-n-propylamine	0.23	UJ	MG/KG	0.21	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	86-30-6	n-Nitrosodiphenylamine	0.47	UJ	MG/KG	0.33	0.47	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	0.7	UJ	MG/KG	0.33	0.7	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	SVOA	108-95-2	Phenol	0.23	UJ	MG/KG	0.18	0.23	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0023	UJ	MG/KG	0.0008	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0023	UJ	MG/KG	0.0007	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0023	UJ	MG/KG	0.0014	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0023	UJ	MG/KG	0.0014	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0023	UJ	MG/KG	0.0013	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0023	UJ	MG/KG	0.0014	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0023	UJ	MG/KG	0.0021	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0023	UJ	MG/KG	0.002	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0023	UJ	MG/KG	0.0013	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0023	UJ	MG/KG	0.0007	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0023	UJ	MG/KG	0.001	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0023	UJ	MG/KG	0.0007	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0023	UJ	MG/KG	0.0013	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0023	UJ	MG/KG	0.0011	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0023	UJ	MG/KG	0.0011	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	78-93-3	2-Butanone	0.0078	J	MG/KG	0.0042	0.0058	Yes
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0058	UJ	MG/KG	0.0021	0.0058	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0058	UJ	MG/KG	0.0033	0.0058	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	67-64-1	Acetone	0.043	J	MG/KG	0.004	0.029	Yes
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	71-43-2	Benzene	0.0023	UJ	MG/KG	0.0009	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0023	UJ	MG/KG	0.0008	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0023	UJ	MG/KG	0.0008	0.0023	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	75-25-2	Bromoform	0.0023	UJ	MG/KG	0.0007	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	74-83-9	Bromomethane	0.012	UJ	MG/KG	0.0021	0.012	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.025	J	MG/KG	0.0049	0.012	Yes
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0023	UJ	MG/KG	0.0014	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0023	UJ	MG/KG	0.0011	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	75-00-3	Chloroethane	0.0023	UJ	MG/KG	0.0013	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	67-66-3	Chloroform	0.0023	UJ	MG/KG	0.001	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	74-87-3	Chloromethane	0.0023	UJ	MG/KG	0.0015	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0023	UJ	MG/KG	0.0012	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0023	UJ	MG/KG	0.0007	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0023	UJ	MG/KG	0.0012	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0023	UJ	MG/KG	0.0006	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0023	UJ	MG/KG	0.0014	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0023	UJ	MG/KG	0.0013	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0023	UJ	MG/KG	0.0013	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0047	UJ	MG/KG	0.0023	0.0047	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	79-20-9	Methyl acetate	0.012	UJ	MG/KG	0.0037	0.012	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0023	UJ	MG/KG	0.0012	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	75-09-2	Methylene chloride	0.012	UJ	MG/KG	0.0016	0.012	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0023	UJ	MG/KG	0.0006	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	95-47-6	o-Xylene	0.0023	UJ	MG/KG	0.0012	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	100-42-5	Styrene	0.0023	UJ	MG/KG	0.001	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0023	UJ	MG/KG	0.0011	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	108-88-3	Toluene	0.0023	UJ	MG/KG	0.0011	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0023	UJ	MG/KG	0.0016	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0023	UJ	MG/KG	0.0007	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0023	UJ	MG/KG	0.0012	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0023	UJ	MG/KG	0.0013	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0023	UJ	MG/KG	0.001	0.0023	No
VENO-SD09	2004568.561	246988.784	VENO-SD09-000H	0	0.5	5/16/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	44000	=	MG/KG	1200	1200	Yes
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.0038	UJ	MG/KG	0.0018	0.0038	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.0038	UJ	MG/KG	0.002	0.0038	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0038	UJ	MG/KG	0.0025	0.0038	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	92-52-4	1,1-Biphenyl	0.19	U	MG/KG	0.18	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	95-94-3	1,2,4,5-Tetrachlorobenzene	0.19	U	MG/KG	0.13	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	108-60-1	2,2'-Oxybis(1-chloropropane)	0.19	U	MG/KG	0.16	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.38	U	MG/KG	0.14	0.38	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.19	U	MG/KG	0.11	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.19	U	MG/KG	0.11	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.19	U	MG/KG	0.14	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.19	U	MG/KG	0.14	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	0.57	UJ	MG/KG	0.23	0.57	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	121-14-2	2,4-Dinitrotoluene	0.19	UJ	MG/KG	0.14	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	606-20-2	2,6-Dinitrotoluene	0.19	U	MG/KG	0.13	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.19	U	MG/KG	0.16	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.19	U	MG/KG	0.13	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	88-74-4	2-Nitroaniline	0.19	U	MG/KG	0.13	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.19	U	MG/KG	0.15	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.38	U	MG/KG	0.31	0.38	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	91-94-1	3,3'-Dichlorobenzidine	0.19	U	MG/KG	0.17	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	99-09-2	3-Nitroaniline	0.19	U	MG/KG	0.14	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	0.57	UJ	MG/KG	0.25	0.57	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	101-55-3	4-Bromophenyl-phenylether	0.19	U	MG/KG	0.14	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.19	U	MG/KG	0.13	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	106-47-8	4-Chloroaniline	0.19	U	MG/KG	0.18	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	7005-72-3	4-Chlorophenyl-phenylether	0.19	U	MG/KG	0.13	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	100-01-6	4-Nitroaniline	0.19	UJ	MG/KG	0.16	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.19	UJ	MG/KG	0.16	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	98-86-2	Acetophenone	0.19	U	MG/KG	0.16	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	1912-24-9	Atrazine	0.19	U	MG/KG	0.14	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	100-52-7	Benzaldehyde	0.19	U	MG/KG	0.19	0.19	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	111-91-1	bis(2-Chloroethoxy)methane	0.19	U	MG/KG	0.12	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	111-44-4	bis(2-Chloroethyl)ether	0.19	U	MG/KG	0.18	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	117-81-7	bis(2-Ethylhexyl)phthalate	0.19	U	MG/KG	0.16	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	85-68-7	Butylbenzylphthalate	0.19	UJ	MG/KG	0.18	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	105-60-2	Caprolactam	0.38	U	MG/KG	0.19	0.38	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	86-74-8	Carbazole	0.19	U	MG/KG	0.13	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	132-64-9	Dibenzofuran	0.19	U	MG/KG	0.13	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	84-66-2	Diethylphthalate	0.19	U	MG/KG	0.14	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	131-11-3	Dimethyl phthalate	0.19	U	MG/KG	0.12	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	84-74-2	Di-n-butylphthalate	0.19	U	MG/KG	0.15	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	117-84-0	Di-n-octylphthalate	0.19	U	MG/KG	0.13	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	118-74-1	Hexachlorobenzene	0.19	U	MG/KG	0.15	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	87-68-3	Hexachlorobutadiene	0.19	U	MG/KG	0.15	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	77-47-4	Hexachlorocyclopentadiene	0.19	U	MG/KG	0.18	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	67-72-1	Hexachloroethane	0.19	U	MG/KG	0.14	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	78-59-1	Isophorone	0.19	U	MG/KG	0.14	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	98-95-3	Nitrobenzene	0.19	U	MG/KG	0.15	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	621-64-7	n-Nitroso-di-n-propylamine	0.19	U	MG/KG	0.17	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	86-30-6	n-Nitrosodiphenylamine	0.38	U	MG/KG	0.27	0.38	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	0.57	U	MG/KG	0.27	0.57	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	SVOA	108-95-2	Phenol	0.19	U	MG/KG	0.15	0.19	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0019	U	MG/KG	0.0007	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0019	U	MG/KG	0.0006	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0019	U	MG/KG	0.0011	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0019	U	MG/KG	0.0011	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0019	U	MG/KG	0.0011	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0019	U	MG/KG	0.0012	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0019	U	MG/KG	0.0017	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0019	U	MG/KG	0.0016	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0019	U	MG/KG	0.0011	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0019	U	MG/KG	0.0006	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0019	U	MG/KG	0.0008	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0019	U	MG/KG	0.0006	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0019	U	MG/KG	0.0011	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0019	U	MG/KG	0.0009	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0019	U	MG/KG	0.0009	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	78-93-3	2-Butanone	0.024	=	MG/KG	0.0034	0.0048	Yes
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0048	U	MG/KG	0.0017	0.0048	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0048	U	MG/KG	0.0027	0.0048	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	67-64-1	Acetone	0.12	=	MG/KG	0.0032	0.024	Yes
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	71-43-2	Benzene	0.0019	U	MG/KG	0.0008	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0019	U	MG/KG	0.0007	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0019	U	MG/KG	0.0007	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	75-25-2	Bromoform	0.0007	J	MG/KG	0.0006	0.0019	Yes
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	74-83-9	Bromomethane	0.0096	U	MG/KG	0.0017	0.0096	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.0096	U	MG/KG	0.004	0.0096	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0019	U	MG/KG	0.0011	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0019	U	MG/KG	0.0009	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	75-00-3	Chloroethane	0.0019	U	MG/KG	0.001	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	67-66-3	Chloroform	0.0019	U	MG/KG	0.0008	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	74-87-3	Chloromethane	0.0019	U	MG/KG	0.0012	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0019	U	MG/KG	0.001	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0019	U	MG/KG	0.0006	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0019	U	MG/KG	0.001	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0019	U	MG/KG	0.0005	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0019	U	MG/KG	0.0012	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0019	U	MG/KG	0.0011	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0019	U	MG/KG	0.001	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0038	U	MG/KG	0.0019	0.0038	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	79-20-9	Methyl acetate	0.0096	U	MG/KG	0.0031	0.0096	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0019	U	MG/KG	0.001	0.0019	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	75-09-2	Methylene chloride	0.0096	U	MG/KG	0.0013	0.0096	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0019	U	MG/KG	0.0005	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	95-47-6	o-Xylene	0.0019	U	MG/KG	0.001	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	100-42-5	Styrene	0.0019	U	MG/KG	0.0008	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0019	U	MG/KG	0.0009	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	108-88-3	Toluene	0.0019	U	MG/KG	0.0009	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0019	U	MG/KG	0.0013	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0019	U	MG/KG	0.0006	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0019	U	MG/KG	0.001	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0019	U	MG/KG	0.001	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0019	U	MG/KG	0.0008	0.0019	No
VENO-SD10	2004623.621	247093.485	VENO-SD10-000H	0	0.5	5/16/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	26000	=	MG/KG	960	960	Yes
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.0047	UJ	MG/KG	0.0023	0.0047	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.0047	UJ	MG/KG	0.0025	0.0047	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0047	UJ	MG/KG	0.0031	0.0047	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	92-52-4	1,1-Biphenyl	0.24	UJ	MG/KG	0.22	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	95-94-3	1,2,4,5-Tetrachlorobenzene	0.24	UJ	MG/KG	0.16	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	108-60-1	2,2'-Oxybis(1-chloropropane)	0.24	UJ	MG/KG	0.19	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.47	UJ	MG/KG	0.17	0.47	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.24	UJ	MG/KG	0.14	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.24	UJ	MG/KG	0.14	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.24	UJ	MG/KG	0.17	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.24	UJ	MG/KG	0.17	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	0.71	UJ	MG/KG	0.28	0.71	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	121-14-2	2,4-Dinitrotoluene	0.24	UJ	MG/KG	0.17	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	606-20-2	2,6-Dinitrotoluene	0.24	UJ	MG/KG	0.16	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.24	UJ	MG/KG	0.19	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.24	UJ	MG/KG	0.17	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	88-74-4	2-Nitroaniline	0.24	UJ	MG/KG	0.16	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.24	UJ	MG/KG	0.18	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.47	UJ	MG/KG	0.38	0.47	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	91-94-1	3,3'-Dichlorobenzidine	0.24	UJ	MG/KG	0.21	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	99-09-2	3-Nitroaniline	0.24	UJ	MG/KG	0.17	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	0.71	UJ	MG/KG	0.31	0.71	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	101-55-3	4-Bromophenyl-phenylether	0.24	UJ	MG/KG	0.17	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.24	UJ	MG/KG	0.16	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	106-47-8	4-Chloroaniline	0.24	UJ	MG/KG	0.22	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	7005-72-3	4-Chlorophenyl-phenylether	0.24	UJ	MG/KG	0.16	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	100-01-6	4-Nitroaniline	0.24	UJ	MG/KG	0.19	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.24	UJ	MG/KG	0.19	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	98-86-2	Acetophenone	0.24	UJ	MG/KG	0.2	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	1912-24-9	Atrazine	0.24	UJ	MG/KG	0.17	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	100-52-7	Benzaldehyde	0.24	UJ	MG/KG	0.23	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	111-91-1	bis(2-Chloroethoxy)methane	0.24	UJ	MG/KG	0.15	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	111-44-4	bis(2-Chloroethyl)ether	0.24	UJ	MG/KG	0.22	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	117-81-7	bis(2-Ethylhexyl)phthalate	0.24	UJ	MG/KG	0.2	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	85-68-7	Butylbenzylphthalate	0.24	UJ	MG/KG	0.22	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	105-60-2	Caprolactam	0.47	UJ	MG/KG	0.24	0.47	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	86-74-8	Carbazole	0.24	UJ	MG/KG	0.16	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	132-64-9	Dibenzofuran	0.24	UJ	MG/KG	0.16	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	84-66-2	Diethylphthalate	0.24	UJ	MG/KG	0.18	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	131-11-3	Dimethyl phthalate	0.24	UJ	MG/KG	0.15	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	84-74-2	Di-n-butylphthalate	0.24	UJ	MG/KG	0.19	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	117-84-0	Di-n-octylphthalate	0.24	UJ	MG/KG	0.16	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	118-74-1	Hexachlorobenzene	0.24	UJ	MG/KG	0.19	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	87-68-3	Hexachlorobutadiene	0.24	UJ	MG/KG	0.19	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	77-47-4	Hexachlorocyclopentadiene	0.24	UJ	MG/KG	0.22	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	67-72-1	Hexachloroethane	0.24	UJ	MG/KG	0.17	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	78-59-1	Isophorone	0.24	UJ	MG/KG	0.17	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	98-95-3	Nitrobenzene	0.24	UJ	MG/KG	0.19	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	621-64-7	n-Nitroso-di-n-propylamine	0.24	UJ	MG/KG	0.21	0.24	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	86-30-6	n-Nitrosodiphenylamine	0.47	UJ	MG/KG	0.33	0.47	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	0.71	UJ	MG/KG	0.33	0.71	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	SVOA	108-95-2	Phenol	0.24	UJ	MG/KG	0.18	0.24	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0027	UJ	MG/KG	0.0009	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0027	UJ	MG/KG	0.0008	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0027	UJ	MG/KG	0.0016	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0027	UJ	MG/KG	0.0016	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0027	UJ	MG/KG	0.0015	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0027	UJ	MG/KG	0.0016	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0027	UJ	MG/KG	0.0024	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0027	UJ	MG/KG	0.0023	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0027	UJ	MG/KG	0.0015	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0027	UJ	MG/KG	0.0008	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0027	UJ	MG/KG	0.0012	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0027	UJ	MG/KG	0.0008	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0027	UJ	MG/KG	0.0015	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0027	UJ	MG/KG	0.0012	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0027	UJ	MG/KG	0.0012	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	78-93-3	2-Butanone	0.023	J	MG/KG	0.0048	0.0066	Yes
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0066	UJ	MG/KG	0.0024	0.0066	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0066	UJ	MG/KG	0.0037	0.0066	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	67-64-1	Acetone	0.1	J	MG/KG	0.0045	0.033	Yes
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	71-43-2	Benzene	0.0027	UJ	MG/KG	0.0011	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0027	UJ	MG/KG	0.0009	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0027	UJ	MG/KG	0.0009	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	75-25-2	Bromoform	0.0027	UJ	MG/KG	0.0008	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	74-83-9	Bromomethane	0.013	UJ	MG/KG	0.0024	0.013	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.013	J	MG/KG	0.0056	0.013	Yes
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0027	UJ	MG/KG	0.0016	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0027	UJ	MG/KG	0.0013	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	75-00-3	Chloroethane	0.0027	UJ	MG/KG	0.0014	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	67-66-3	Chloroform	0.0027	UJ	MG/KG	0.0011	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	74-87-3	Chloromethane	0.0027	UJ	MG/KG	0.0017	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0027	UJ	MG/KG	0.0014	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0027	UJ	MG/KG	0.0008	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0027	UJ	MG/KG	0.0014	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0027	UJ	MG/KG	0.0007	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0027	UJ	MG/KG	0.0016	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0027	UJ	MG/KG	0.0015	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0027	UJ	MG/KG	0.0014	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0053	UJ	MG/KG	0.0026	0.0053	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	79-20-9	Methyl acetate	0.013	UJ	MG/KG	0.0042	0.013	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0027	UJ	MG/KG	0.0014	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	75-09-2	Methylene chloride	0.013	UJ	MG/KG	0.0018	0.013	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0027	UJ	MG/KG	0.0007	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	95-47-6	o-Xylene	0.0027	UJ	MG/KG	0.0014	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	100-42-5	Styrene	0.0027	UJ	MG/KG	0.0012	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0027	UJ	MG/KG	0.0013	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	108-88-3	Toluene	0.0027	UJ	MG/KG	0.0012	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0027	UJ	MG/KG	0.0018	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0027	UJ	MG/KG	0.0008	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0027	UJ	MG/KG	0.0013	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0027	UJ	MG/KG	0.0014	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0027	UJ	MG/KG	0.0012	0.0027	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-000H	0	0.5	5/16/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	36000	=	MG/KG	1200	1200	Yes
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.0021	UJ	MG/KG	0.001	0.0021	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.0015	J	MG/KG	0.0011	0.0021	Yes
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.0021	UJ	MG/KG	0.0014	0.0021	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	92-52-4	1,1-Biphenyl	0.11	U	MG/KG	0.1	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	95-94-3	1,2,4,5-Tetrachlorobenzene	0.11	U	MG/KG	0.073	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	108-60-1	2,2'-Oxybis(1-chloropropane)	0.11	U	MG/KG	0.086	0.11	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.21	U	MG/KG	0.078	0.21	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.11	U	MG/KG	0.061	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.11	U	MG/KG	0.063	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.11	U	MG/KG	0.075	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.11	U	MG/KG	0.078	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	0.32	UJ	MG/KG	0.13	0.32	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	121-14-2	2,4-Dinitrotoluene	0.11	UJ	MG/KG	0.076	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	606-20-2	2,6-Dinitrotoluene	0.11	U	MG/KG	0.073	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.11	U	MG/KG	0.086	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.11	U	MG/KG	0.074	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	88-74-4	2-Nitroaniline	0.11	U	MG/KG	0.07	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.11	U	MG/KG	0.082	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.21	U	MG/KG	0.17	0.21	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	91-94-1	3,3'-Dichlorobenzidine	0.11	U	MG/KG	0.096	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	99-09-2	3-Nitroaniline	0.11	U	MG/KG	0.078	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	0.32	UJ	MG/KG	0.14	0.32	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	101-55-3	4-Bromophenyl-phenylether	0.11	U	MG/KG	0.077	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.11	U	MG/KG	0.07	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	106-47-8	4-Chloroaniline	0.11	U	MG/KG	0.097	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	7005-72-3	4-Chlorophenyl-phenylether	0.11	U	MG/KG	0.07	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	100-01-6	4-Nitroaniline	0.11	UJ	MG/KG	0.086	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.11	UJ	MG/KG	0.086	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	98-86-2	Acetophenone	0.11	U	MG/KG	0.087	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	1912-24-9	Atrazine	0.11	U	MG/KG	0.078	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	100-52-7	Benzaldehyde	0.11	U	MG/KG	0.1	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	111-91-1	bis(2-Chloroethoxy)methane	0.11	U	MG/KG	0.067	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	111-44-4	bis(2-Chloroethyl)ether	0.11	U	MG/KG	0.097	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	117-81-7	bis(2-Ethylhexyl)phthalate	0.11	U	MG/KG	0.089	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	85-68-7	Butylbenzylphthalate	0.11	UJ	MG/KG	0.098	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	105-60-2	Caprolactam	0.21	U	MG/KG	0.11	0.21	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	86-74-8	Carbazole	0.11	U	MG/KG	0.071	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	132-64-9	Dibenzofuran	0.11	U	MG/KG	0.069	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	84-66-2	Diethylphthalate	0.11	U	MG/KG	0.079	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	131-11-3	Dimethyl phthalate	0.11	U	MG/KG	0.065	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	84-74-2	Di-n-butylphthalate	0.11	U	MG/KG	0.083	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	117-84-0	Di-n-octylphthalate	0.11	U	MG/KG	0.07	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	118-74-1	Hexachlorobenzene	0.11	U	MG/KG	0.085	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	87-68-3	Hexachlorobutadiene	0.11	U	MG/KG	0.084	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	77-47-4	Hexachlorocyclopentadiene	0.11	U	MG/KG	0.098	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	67-72-1	Hexachloroethane	0.11	U	MG/KG	0.078	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	78-59-1	Isophorone	0.11	U	MG/KG	0.076	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	98-95-3	Nitrobenzene	0.11	U	MG/KG	0.083	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	621-64-7	n-Nitroso-di-n-propylamine	0.11	U	MG/KG	0.095	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	86-30-6	n-Nitrosodiphenylamine	0.21	U	MG/KG	0.15	0.21	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	0.32	U	MG/KG	0.15	0.32	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	SVOA	108-95-2	Phenol	0.11	U	MG/KG	0.08	0.11	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0012	U	MG/KG	0.0004	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0012	U	MG/KG	0.0004	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0012	U	MG/KG	0.0007	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0012	U	MG/KG	0.0007	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0012	U	MG/KG	0.0007	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0012	U	MG/KG	0.0007	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0012	U	MG/KG	0.0011	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0012	U	MG/KG	0.001	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0012	U	MG/KG	0.0007	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0012	U	MG/KG	0.0004	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0012	U	MG/KG	0.0005	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0012	U	MG/KG	0.0004	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0012	U	MG/KG	0.0006	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0012	U	MG/KG	0.0006	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0012	U	MG/KG	0.0005	0.0012	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	78-93-3	2-Butanone	0.0083	=	MG/KG	0.0021	0.0029	Yes
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0029	U	MG/KG	0.0011	0.0029	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0029	U	MG/KG	0.0016	0.0029	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	67-64-1	Acetone	0.037	=	MG/KG	0.002	0.015	Yes
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	71-43-2	Benzene	0.0012	U	MG/KG	0.0005	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0012	U	MG/KG	0.0004	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0012	U	MG/KG	0.0004	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	75-25-2	Bromoform	0.0012	U	MG/KG	0.0004	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	74-83-9	Bromomethane	0.0059	U	MG/KG	0.0011	0.0059	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.021	=	MG/KG	0.0025	0.0059	Yes
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0012	U	MG/KG	0.0007	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0012	U	MG/KG	0.0006	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	75-00-3	Chloroethane	0.0012	U	MG/KG	0.0006	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	67-66-3	Chloroform	0.0012	U	MG/KG	0.0005	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	74-87-3	Chloromethane	0.0012	U	MG/KG	0.0008	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0012	U	MG/KG	0.0006	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0012	U	MG/KG	0.0004	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0012	U	MG/KG	0.0006	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0012	U	MG/KG	0.0003	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0012	U	MG/KG	0.0007	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0012	U	MG/KG	0.0007	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0012	U	MG/KG	0.0006	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0023	U	MG/KG	0.0012	0.0023	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	79-20-9	Methyl acetate	0.0059	U	MG/KG	0.0019	0.0059	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0012	U	MG/KG	0.0006	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	75-09-2	Methylene chloride	0.0059	U	MG/KG	0.0008	0.0059	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0012	U	MG/KG	0.0003	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	95-47-6	o-Xylene	0.0012	U	MG/KG	0.0006	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	100-42-5	Styrene	0.0012	U	MG/KG	0.0005	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0012	U	MG/KG	0.0006	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	108-88-3	Toluene	0.0012	U	MG/KG	0.0005	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0012	U	MG/KG	0.0008	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0012	U	MG/KG	0.0004	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0012	U	MG/KG	0.0006	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0012	U	MG/KG	0.0006	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0012	U	MG/KG	0.0005	0.0012	No
VENO-SD11	2004656.558	247208.658	VENO-SD11-0H01	0.5	1	5/16/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	20000	=	MG/KG	530	530	Yes
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	PEST/PCB	72-54-8	4,4'-DDD	0.004	J	MG/KG	0.0025	0.0051	Yes
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	PEST/PCB	72-55-9	4,4'-DDE	0.014	J	MG/KG	0.0027	0.0051	Yes
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	PEST/PCB	50-29-3	4,4'-DDT	0.004	J	MG/KG	0.0034	0.0051	Yes
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	92-52-4	1,1-Biphenyl	0.26	UJ	MG/KG	0.24	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	95-94-3	1,2,4,5-Tetrachlorobenzene	0.26	UJ	MG/KG	0.18	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	108-60-1	2,2'-Oxybis(1-chloropropane)	0.26	UJ	MG/KG	0.21	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	58-90-2	2,3,4,6-Tetrachlorophenol	0.51	UJ	MG/KG	0.19	0.51	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	95-95-4	2,4,5-Trichlorophenol	0.26	UJ	MG/KG	0.15	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	88-06-2	2,4,6-Trichlorophenol	0.26	UJ	MG/KG	0.15	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	120-83-2	2,4-Dichlorophenol	0.26	UJ	MG/KG	0.18	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	105-67-9	2,4-Dimethylphenol	0.26	UJ	MG/KG	0.19	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	51-28-5	2,4-Dinitrophenol	0.77	UJ	MG/KG	0.31	0.77	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	121-14-2	2,4-Dinitrotoluene	0.26	UJ	MG/KG	0.18	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	606-20-2	2,6-Dinitrotoluene	0.26	UJ	MG/KG	0.18	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	95-57-8	2-Chlorophenol	0.26	UJ	MG/KG	0.21	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	95-48-7	2-Methylphenol	0.26	UJ	MG/KG	0.18	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	88-74-4	2-Nitroaniline	0.26	UJ	MG/KG	0.17	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	88-75-5	2-Nitrophenol	0.26	UJ	MG/KG	0.2	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	m&pCRESOL	3- and 4-Methylphenol	0.51	UJ	MG/KG	0.41	0.51	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	91-94-1	3,3'-Dichlorobenzidine	0.26	UJ	MG/KG	0.23	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	99-09-2	3-Nitroaniline	0.26	UJ	MG/KG	0.19	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	534-52-1	4,6-Dinitro-2-methylphenol	0.77	UJ	MG/KG	0.33	0.77	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	101-55-3	4-Bromophenyl-phenylether	0.26	UJ	MG/KG	0.19	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	59-50-7	4-Chloro-3-methylphenol	0.26	UJ	MG/KG	0.17	0.26	No

Attachment C-6
Analytical Data Used in the HHRA
Laguna La Chiva
Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	106-47-8	4-Chloroaniline	0.26	UJ	MG/KG	0.24	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	7005-72-3	4-Chlorophenyl-phenylether	0.26	UJ	MG/KG	0.17	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	100-01-6	4-Nitroaniline	0.26	UJ	MG/KG	0.21	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	100-02-7	4-Nitrophenol	0.26	UJ	MG/KG	0.21	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	98-86-2	Acetophenone	0.26	UJ	MG/KG	0.21	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	1912-24-9	Atrazine	0.26	UJ	MG/KG	0.19	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	100-52-7	Benzaldehyde	0.26	UJ	MG/KG	0.25	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	111-91-1	bis(2-Chloroethoxy)methane	0.26	UJ	MG/KG	0.16	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	111-44-4	bis(2-Chloroethyl)ether	0.26	UJ	MG/KG	0.24	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	117-81-7	bis(2-Ethylhexyl)phthalate	0.26	UJ	MG/KG	0.22	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	85-68-7	Butylbenzylphthalate	0.26	UJ	MG/KG	0.24	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	105-60-2	Caprolactam	0.51	UJ	MG/KG	0.26	0.51	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	86-74-8	Carbazole	0.26	UJ	MG/KG	0.17	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	132-64-9	Dibenzofuran	0.26	UJ	MG/KG	0.17	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	84-66-2	Diethylphthalate	0.26	UJ	MG/KG	0.19	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	131-11-3	Dimethyl phthalate	0.26	UJ	MG/KG	0.16	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	84-74-2	Di-n-butylphthalate	0.26	UJ	MG/KG	0.2	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	117-84-0	Di-n-octylphthalate	0.26	UJ	MG/KG	0.17	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	118-74-1	Hexachlorobenzene	0.26	UJ	MG/KG	0.21	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	87-68-3	Hexachlorobutadiene	0.26	UJ	MG/KG	0.2	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	77-47-4	Hexachlorocyclopentadiene	0.26	UJ	MG/KG	0.24	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	67-72-1	Hexachloroethane	0.26	UJ	MG/KG	0.19	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	78-59-1	Isophorone	0.26	UJ	MG/KG	0.18	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	98-95-3	Nitrobenzene	0.26	UJ	MG/KG	0.2	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	621-64-7	n-Nitroso-di-n-propylamine	0.26	UJ	MG/KG	0.23	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	86-30-6	n-Nitrosodiphenylamine	0.51	UJ	MG/KG	0.36	0.51	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	87-86-5	Pentachlorophenol	0.77	UJ	MG/KG	0.36	0.77	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	SVOA	108-95-2	Phenol	0.26	UJ	MG/KG	0.19	0.26	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	71-55-6	1,1,1-Trichloroethane	0.0026	UJ	MG/KG	0.0009	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	79-34-5	1,1,2,2-Tetrachloroethane	0.0026	UJ	MG/KG	0.0008	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	0.0026	UJ	MG/KG	0.0015	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	79-00-5	1,1,2-Trichloroethane	0.0026	UJ	MG/KG	0.0015	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	75-34-3	1,1-Dichloroethane	0.0026	UJ	MG/KG	0.0015	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	75-35-4	1,1-Dichloroethene	0.0026	UJ	MG/KG	0.0016	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	87-61-6	1,2,3-Trichlorobenzene	0.0026	UJ	MG/KG	0.0023	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	120-82-1	1,2,4-Trichlorobenzene	0.0026	UJ	MG/KG	0.0022	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	96-12-8	1,2-Dibromo-3-chloropropane	0.0026	UJ	MG/KG	0.0015	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	106-93-4	1,2-Dibromoethane	0.0026	UJ	MG/KG	0.0008	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	95-50-1	1,2-Dichlorobenzene	0.0026	UJ	MG/KG	0.0011	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	107-06-2	1,2-Dichloroethane	0.0026	UJ	MG/KG	0.0008	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	78-87-5	1,2-Dichloropropane	0.0026	UJ	MG/KG	0.0014	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	541-73-1	1,3-Dichlorobenzene	0.0026	UJ	MG/KG	0.0012	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	106-46-7	1,4-Dichlorobenzene	0.0026	UJ	MG/KG	0.0011	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	78-93-3	2-Butanone	0.016	J	MG/KG	0.0046	0.0064	Yes
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	591-78-6	2-Hexanone	0.0064	UJ	MG/KG	0.0023	0.0064	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	108-10-1	4-Methyl-2-pentanone	0.0064	UJ	MG/KG	0.0036	0.0064	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	67-64-1	Acetone	0.073	J	MG/KG	0.0043	0.032	Yes
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	71-43-2	Benzene	0.0026	UJ	MG/KG	0.001	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	74-97-5	Bromochloromethane	0.0026	UJ	MG/KG	0.0009	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	75-27-4	Bromodichloromethane	0.0026	UJ	MG/KG	0.0009	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	75-25-2	Bromoform	0.0026	UJ	MG/KG	0.0008	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	74-83-9	Bromomethane	0.013	UJ	MG/KG	0.0023	0.013	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	75-15-0	Carbon disulfide	0.021	J	MG/KG	0.0054	0.013	Yes
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	56-23-5	Carbon tetrachloride	0.0026	UJ	MG/KG	0.0015	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	108-90-7	Chlorobenzene	0.0026	UJ	MG/KG	0.0012	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	75-00-3	Chloroethane	0.0026	UJ	MG/KG	0.0014	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	67-66-3	Chloroform	0.0026	UJ	MG/KG	0.0011	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	74-87-3	Chloromethane	0.0026	UJ	MG/KG	0.0017	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	156-59-2	cis-1,2-Dichloroethene	0.0026	UJ	MG/KG	0.0014	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	10061-01-5	cis-1,3-Dichloropropene	0.0026	UJ	MG/KG	0.0008	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	110-82-7	Cyclohexane	0.0026	UJ	MG/KG	0.0014	0.0026	No

Attachment C-6

Analytical Data Used in the HHRA

Laguna La Chiva

Former Vieques Naval Training Range, Vieques, Puerto Rico

Station ID	Northing	Easting	Sample ID	Upper Depth	Lower Depth	Date Collected	Matrix	Sample Type	Chem Group	Param ID	Param Name	Ana Value	Proj Qual	Units	Detect Limit	Reporting Limit	Detected
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	124-48-1	Dibromochloromethane	0.0026	UJ	MG/KG	0.0007	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	75-71-8	Dichlorodifluoromethane (Freon-12)	0.0026	UJ	MG/KG	0.0016	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	100-41-4	Ethylbenzene	0.0026	UJ	MG/KG	0.0014	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	98-82-8	Isopropylbenzene	0.0026	UJ	MG/KG	0.0014	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	m&pXYLENE	m- and p-Xylene	0.0051	UJ	MG/KG	0.0025	0.0051	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	79-20-9	Methyl acetate	0.013	UJ	MG/KG	0.0041	0.013	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	108-87-2	Methylcyclohexane	0.0026	UJ	MG/KG	0.0013	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	75-09-2	Methylene chloride	0.013	UJ	MG/KG	0.0018	0.013	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	1634-04-4	Methyl-tert-butyl ether (MTBE)	0.0026	UJ	MG/KG	0.0007	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	95-47-6	o-Xylene	0.0026	UJ	MG/KG	0.0013	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	100-42-5	Styrene	0.0026	UJ	MG/KG	0.0011	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	127-18-4	Tetrachloroethene	0.0026	UJ	MG/KG	0.0013	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	108-88-3	Toluene	0.0026	UJ	MG/KG	0.0012	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	156-60-5	trans-1,2-Dichloroethene	0.0026	UJ	MG/KG	0.0018	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	10061-02-6	trans-1,3-Dichloropropene	0.0026	UJ	MG/KG	0.0008	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	79-01-6	Trichloroethene	0.0026	UJ	MG/KG	0.0013	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	75-69-4	Trichlorofluoromethane (Freon-11)	0.0026	UJ	MG/KG	0.0014	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	VOA	75-01-4	Vinyl chloride	0.0026	UJ	MG/KG	0.0011	0.0026	No
VENO-SD12	2004446.632	246780.761	VENO-SD12-000H	0	0.5	5/15/2013	SD	N	WCHEM	TOC	Total organic carbon (TOC)	55000	=	MG/KG	1300	1300	Yes
VENO-SO01	2004380.302	246869.581	VENO-SS01-0002	0	2	5/14/2013	SS	N	PEST/PCB	72-54-8	4,4'-DDD	0.0013	UJ	MG/KG	0.00063	0.0013	No
VENO-SO01	2004380.302	246869.581	VENO-SS01-0002	0	2	5/14/2013	SS	N	PEST/PCB	72-55-9	4,4'-DDE	0.0013	UJ	MG/KG	0.00068	0.0013	No
VENO-SO01	2004380.302	246869.581	VENO-SS01-0002	0	2	5/14/2013	SS	N	PEST/PCB	50-29-3	4,4'-DDT	0.0013	UJ	MG/KG	0.00087	0.0013	No
VENO-SO01	2004380.302	246869.581	VENO-SS01-0002	0	2	5/14/2013	SS	N	WCHEM	TOC	Total organic carbon (TOC)	14000	=	MG/KG	660	660	Yes
VENO-SO02	2004606.978	246892.737	VENO-SS02-0001	0	1	5/16/2013	SS	N	PEST/PCB	72-54-8	4,4'-DDD	0.0014	UJ	MG/KG	0.00066	0.0014	No
VENO-SO02	2004606.978	246892.737	VENO-SS02-0001	0	1	5/16/2013	SS	N	PEST/PCB	72-55-9	4,4'-DDE	0.0014	UJ	MG/KG	0.00072	0.0014	No
VENO-SO02	2004606.978	246892.737	VENO-SS02-0001	0	1	5/16/2013	SS	N	PEST/PCB	50-29-3	4,4'-DDT	0.0014	UJ	MG/KG	0.00091	0.0014	No
VENO-SO02	2004606.978	246892.737	VENO-SS02-0001	0	1	5/16/2013	SS	N	WCHEM	TOC	Total organic carbon (TOC)	10000	=	MG/KG	690	690	Yes
VENO-SO03	2004713.69	247097.902	VENO-SS03-0001	0	1	5/16/2013	SS	N	PEST/PCB	72-54-8	4,4'-DDD	0.0014	U	MG/KG	0.00067	0.0014	No
VENO-SO03	2004713.69	247097.902	VENO-SS03-0001	0	1	5/16/2013	SS	N	PEST/PCB	72-55-9	4,4'-DDE	0.0014	U	MG/KG	0.00073	0.0014	No
VENO-SO03	2004713.69	247097.902	VENO-SS03-0001	0	1	5/16/2013	SS	N	PEST/PCB	50-29-3	4,4'-DDT	0.0014	UJ	MG/KG	0.00092	0.0014	No
VENO-SO03	2004713.69	247097.902	VENO-SS03-0001	0	1	5/16/2013	SS	N	WCHEM	TOC	Total organic carbon (TOC)	8900	=	MG/KG	700	700	Yes
VENO-SO04	2004533.735	246981.563	VENO-SS04-0001	0	1	5/14/2013	SS	N	PEST/PCB	72-54-8	4,4'-DDD	0.0015	UJ	MG/KG	0.00071	0.0015	No
VENO-SO04	2004533.735	246981.563	VENO-SS04-0001	0	1	5/14/2013	SS	N	PEST/PCB	72-55-9	4,4'-DDE	0.0015	UJ	MG/KG	0.00077	0.0015	No
VENO-SO04	2004533.735	246981.563	VENO-SS04-0001	0	1	5/14/2013	SS	N	PEST/PCB	50-29-3	4,4'-DDT	0.0015	UJ	MG/KG	0.00098	0.0015	No
VENO-SO04	2004533.735	246981.563	VENO-SS04-0001	0	1	5/14/2013	SS	N	WCHEM	TOC	Total organic carbon (TOC)	13000	=	MG/KG	740	740	Yes
VENO-SO05	2004449.352	246981.539	VENO-SS05-0002	0	2	5/14/2013	SS	N	PEST/PCB	72-54-8	4,4'-DDD	0.11	U	MG/KG	0.051	0.11	No
VENO-SO05	2004449.352	246981.539	VENO-SS05-0002	0	2	5/14/2013	SS	N	PEST/PCB	72-55-9	4,4'-DDE	2.3	=	MG/KG	0.056	0.11	Yes
VENO-SO05	2004449.352	246981.539	VENO-SS05-0002	0	2	5/14/2013	SS	N	PEST/PCB	50-29-3	4,4'-DDT	0.11	UJ	MG/KG	0.071	0.11	No
VENO-SO05	2004449.352	246981.539	VENO-SS05-0002	0	2	5/14/2013	SS	N	WCHEM	TOC	Total organic carbon (TOC)	22000	=	MG/KG	540	540	Yes
VENO-SO06	2004583.737	247117.458	VENO-SS06-0001	0	1	5/16/2013	SS	N	PEST/PCB	72-54-8	4,4'-DDD	0.002	UJ	MG/KG	0.00096	0.002	No
VENO-SO06	2004583.737	247117.458	VENO-SS06-0001	0	1	5/16/2013	SS	N	PEST/PCB	72-55-9	4,4'-DDE	0.002	UJ	MG/KG	0.001	0.002	No
VENO-SO06	2004583.737	247117.458	VENO-SS06-0001	0	1	5/16/2013	SS	N	PEST/PCB	50-29-3	4,4'-DDT	0.002	UJ	MG/KG	0.0013	0.002	No
VENO-SO06	2004583.737	247117.458	VENO-SS06-0001	0	1	5/16/2013	SS	N	WCHEM	TOC	Total organic carbon (TOC)	17000	=	MG/KG	1000	1000	Yes
VENO-SO07	2004478.953	247117.624	VENO-SS07-0002	0	2	5/14/2013	SS	N	PEST/PCB	72-54-8	4,4'-DDD	0.0021	U	MG/KG	0.001	0.0021	No
VENO-SO07	2004478.953	247117.624	VENO-SS07-0002	0	2	5/14/2013	SS	N	PEST/PCB	72-55-9	4,4'-DDE	0.0021	U	MG/KG	0.0011	0.0021	No
VENO-SO07	2004478.953	247117.624	VENO-SS07-0002	0	2	5/14/2013	SS	N	PEST/PCB	50-29-3	4,4'-DDT	0.0021	UJ	MG/KG	0.0014	0.0021	No
VENO-SO07	2004478.953	247117.624	VENO-SS07-0002	0	2	5/14/2013	SS	N	WCHEM	TOC	Total organic carbon (TOC)	24000	=	MG/KG	530	530	Yes

Appendix D
Ecological Risk Assessment

Contents

Section **Page**

1 Ecological Risk Assessment 1-1
1.1 Introduction 1-1
1.1.1 Ecological Risk Assessment Process 1-1
1.2 Problem Formulation 1-3
1.2.1 Ecological Setting 1-3
1.2.2 Summary of Available Analytical Data 1-5
1.2.3 Conceptual Site Model 1-5
1.3 Exposure Assessment 1-8
1.3.1 Selection Criteria for Analytical Data 1-8
1.3.2 Data Groupings 1-8
1.3.3 Exposure Point Concentrations 1-8
1.3.4 Dietary Intakes 1-12
1.4 Effects Assessment 1-13
1.4.1 Medium-Specific ESVs 1-13
1.4.2 Ingestion TRVs 1-14
1.5 Risk Characterization 1-15
1.5.1 Methodology 1-15
1.5.2 Terrestrial Habitat – Laguna La Chiva Surface Soil 1-16
1.5.3 Aquatic Habitat – Laguna La Chiva Sediment 1-17
1.5.4 Risk Evaluation 1-18
1.5.5 Risk Summary and Conclusions 1-19
1.6 Uncertainties 1-19
1.7 References 1-21

Tables

D-1 Federally Listed Species Occurring or Potentially Occurring at NASD Vieques
D-2 Samples Used in the Ecological Risk Assessment
D-3 Physical Sediment and Soil Parameter Measurements - Laguna La Chiva
D-4 Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints
D-5 Bioaccumulative Chemicals List and Log Kow Values
D-6 Soil Bioconcentration Factors For Plants (Dry Weight)
D-7 Bioconcentration/Bioaccumulation Factor Models (Dry Weight)
D-8 Soil Bioaccumulation Factors For Soil Invertebrates (Dry Weight)
D-9 Soil Bioaccumulation Factors For Small Mammals (Dry Weight) – Omnivores
D-10 Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Benthic Invertebrates
D-11 Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Fish
D-12 Exposure Parameters for Upper Trophic Level Ecological Receptors – Screening
D-13 Exposure Parameters for Upper Trophic Level Ecological Receptors - Baseline
D-14 Soil Ecological Screening Values (ESVs) for Plants and Soil Invertebrates
D-15 Marine Sediment Ecological Screening Values (ESVs)
D-16 Marine Sediment Values Based on Equilibrium Partitioning (EqP)
D-17 Uncertainty Factors
D-18 Eco-SSL Values for Birds and Mammals

D-19 Ingestion-Based Toxicity Reference Values (TRVs) for Mammals
D-20 Ingestion-Based Toxicity Reference Values (TRVs) for Birds
D-21 Background Data and Upper Tolerance Limits (UTLs) - Surface Soil
D-22 Screening Statistics for Plants and Soil Invertebrates - Laguna La Chiva Surface Soil
D-23 Screening Statistics - Laguna La Chiva Surface Soil - Mammal/Bird Eco-SSLs
D-24 Hazard Quotients for Terrestrial Food Web Exposures - Step 2 (Screening) - Maximum
D-25 Hazard Quotients for Terrestrial Food Web Exposures - Step 3A (Baseline) - 95% UCL
D-26 Hazard Quotients for Terrestrial Food Web Exposures - Step 3A (Baseline) - Mean
D-27 Screening Statistics - Sediment - Laguna La Chiva
D-28 Comparison of Sediment Step 3A COPC Concentrations With Equilibrium Partitioning-Based Sediment Values - Laguna La Chiva
D-29 Hazard Quotients for Aquatic Food Web Exposures - Step 2 (Screening) - Maximum
D-30 Hazard Quotients for Aquatic Food Web Exposures - Step 3A (Baseline) - 95% UCL
D-31 Hazard Quotients for Aquatic Food Web Exposures - Step 3A (Baseline) - Mean
D-32 Reporting Limit to Screening Value Comparison

Figures

D-1 Laguna La Chiva Soil and Sediment Sample Locations
D-2 Ecological Conceptual Site Model

Attachments

1 Terrestrial Food Web Calculations

2 Aquatic Food Web Calculations

APPENDIX D

Ecological Risk Assessment

1.1 Introduction

This appendix contains a screening ecological risk assessment (SERA), constituting Steps 1 and 2 of the ecological risk assessment (ERA) process, and the first step (Step 3A) of a baseline ecological risk assessment (BERA) for Laguna La Chiva. Laguna La Chiva is located at the Former Vieques Naval Training Range (VNTR) on east Vieques, Puerto Rico.

The approach, methods, and assumptions used for this ERA were based upon the final ERA protocol presented in the *Master Standard Operating Procedures, Protocols, and Plans* (CH2M HILL, 2010a), and the *Master Ecological Risk Assessment Protocol for Vieques Environmental Restoration Program – Update 1 (Addendum)* (CH2M HILL, 2010b).

1.1.1 Ecological Risk Assessment Process

This ERA was conducted in accordance with the *Navy Policy for Conducting Ecological Risk Assessments* (CNO, 1999) and the Navy guidance for implementing this ERA policy (NAVFAC, 2003). The Navy ERA policy and guidance, which describe a process consisting of eight steps organized into three tiers, are conceptually similar to the eight-step ERA process outlined in U.S. Environmental Protection Agency (USEPA) ERA guidance for the Superfund program (USEPA, 1997a). For both sets of guidance, Steps 1 and 2 involve conducting a SERA using very conservative assumptions. The BERA represents Steps 3 through 7. The BERA uses more realistic assumptions and site-specific data to refine the risk estimates from the SERA for components that fail the initial screen. Step 8 addresses risk management issues. The major differences between the Navy ERA policy/guidance and the USEPA ERA guidance are:

1. The Navy policy/guidance provides clearly defined criteria for exiting the ERA process at specific points.
2. The Navy policy/guidance divides Step 3 (the first step of the BERA) into two distinct sub-steps (Steps 3A and 3B), with a potential exit point after Step 3A.
3. The Navy policy/guidance incorporates risk management considerations throughout all tiers of the ERA process.

ERAs are conducted using a tiered, step-wise approach and are punctuated with Scientific Management Decision Points (SMDPs). SMDPs represent points in the ERA process where agreement on conclusions, actions, or methodologies is needed so that the ERA process can continue (or terminate) in a technically defensible manner. The results of the ERA at a particular SMDP are used to determine how the ERA process should proceed, for example, to the next step in the process or directly to a later step. The process continues until a final decision has been reached (i.e., remedial action or controls if unacceptable risks are identified, or no further action if risks are acceptable). The process can also be iterative if data needs are identified at any step; the needed data are collected and the process starts again at the point appropriate to the type of data collected.

The screening (preliminary) problem formulation is the first step of an ERA and establishes the goals, scope, and focus of the SERA. As part of problem formulation, the environmental setting of the site is characterized in terms of the habitats and biota known or likely to be present. The types and concentrations of chemicals that are present in ecologically relevant media (such as surface sediment and surface soil) are also described. A preliminary conceptual model is developed that describes potential source areas, potential transport pathways (the mechanisms whereby chemicals may be transported from a source of contamination to ecologically relevant media), potential exposure pathways (an exposure pathway links a potential source of contamination with one or more receptors through exposure via one or more media and exposure routes), potential exposure routes (e.g., ingestion), and potential receptors. Assessment endpoints, measurement endpoints, and risk hypotheses are then selected to evaluate those receptors for

which complete and potentially significant exposure pathways are likely to exist[1]. The fate, transport, and toxicological properties of the chemicals present at the site, particularly the potential for bioaccumulation, are also considered during the problem formulation process.

Step 1 of the ERA process is intended to answer two main questions:

1. Do complete exposure pathways exist?
2. Are sufficient data available to conduct the SERA?

If no complete exposure pathways exist, the ERA process terminates at Step 1 with a conclusion of negligible (acceptable) risk because exposure, and thus potential risk, can only occur if complete exposure pathways exist. If one or more complete exposure pathways are known to exist, or are likely to exist, the ERA process continues to Step 2 but only evaluates those pathways that have been determined to be "critical" (ecologically important), that is, represent exposures to sensitive receptors that are associated with the predominant fate and transport mechanisms at the site (USEPA, 1997a). An evaluation of the available data is then conducted to determine if they are adequate to support the SERA. If not, additional data are collected before the ERA process continues. The second step of the ERA process involves conducting a screening exposure assessment, a screening effects assessment, and a screening risk calculation (risk characterization) based upon very conservative assumptions.

The results of the SERA are used to evaluate the potential for unacceptable ecological risks based upon very conservative assumptions. If the results of the SERA suggest that further ecological risk evaluation is warranted, the ERA process proceeds to the BERA (Steps 3 through 7), which is a more detailed phase of the ERA process, for the pathways, chemicals, receptors, and areas identified in the SERA. As indicated above, the first step of the BERA (Step 3) is divided into two distinct sub-steps (3A and 3B) in Navy ERA guidance.

Step 3 of the USEPA ERA guidance consists of the following activities (USEPA, 1997a):

1. Refinement of the Chemicals of Potential Concern (COPCs) from the SERA.
2. Further characterizing the potential ecological effects of contaminants.
3. Refining information on contaminant fate and transport, complete exposure pathways, and receptors potentially at risk.
4. Selecting assessment endpoints.
5. Refining the conceptual model and risk hypotheses from the SERA.

Step 3A of the Navy policy/guidance (refinement of conservative exposure assumptions) corresponds to the first activity listed above for the USEPA ERA guidance. In Step 3A, a refined evaluation of exposure estimates is conducted using more realistic assumptions and additional methodologies relative to those used in the SERA, which is intended to be a very conservative assessment. Examples of more realistic exposure assumptions include using central tendency (e.g., mean) estimates (rather than maximums) for media concentrations, bioaccumulation factors, and exposure parameters. Examples of additional methodologies include consideration of background and upgradient concentrations, bioavailability, and detection frequency (CNO, 1999; NAVFAC, 2003).

If risk estimates (and their associated uncertainty) are acceptable following Step 3A, the site will meet the conditions of the exit criterion specified in the Navy guidance. If the Step 3A evaluation does not support a determination of acceptable risk within acceptable uncertainty, the site continues to Step 3B.

[1] An assessment endpoint is an explicit expression of the environmental component or value that is to be protected. A measurement endpoint is a measurable ecological characteristic that is related to the component or value chosen as the assessment endpoint. Risk hypotheses are testable hypotheses about the relationship among the assessment endpoints and their predicted responses when exposed to contaminants or other stressors.

Step 3B of the Navy policy/guidance (problem formulation) corresponds conceptually to the last four activities of Step 3 listed above for the USEPA ERA guidance. In Step 3B, the preliminary conceptual model from the SERA is refined based upon the results of the Step 3A evaluation to develop a revised list of key receptors, critical exposure pathways, key COPCs, assessment endpoints, measurement endpoints, and risk hypotheses. Based upon the refined conceptual model, the lines of evidence to be used in characterizing risk are determined. Agreement on the refined conceptual model, COPCs, exposure pathways, endpoints, and risk hypotheses constitutes the SMDP at the end of Step 3 in both Navy and USEPA ERA guidance.

Following the completion of Step 3, a decision point is reached with two potential outcomes. If the refined risk estimates are acceptable for each selected assessment endpoint, the investigation proceeds to risk characterization (Step 7) to document this conclusion and the ERA process terminates. If the uncertainties associated with the refined risk estimates are unacceptable and/or the risk estimates indicate that unacceptable risks may exist, site-specific studies might be required and the ERA process continues (Steps 4 through 6). Step 4 is a work planning step where additional site-specific studies are scoped and designed. Step 5 consists of the verification of the field sampling design developed in Step 4 while Step 6 constitutes the site investigation and data analysis phase of the process. The scope (e.g., spatial extent of sampling) and components (e.g., collection of biological data, such as tissue samples, toxicity testing, etc.) of any site-specific studies are determined by the conclusions of Step 3 and the pathways/endpoints associated with the potential unacceptable risks.

Step 7 consists of the documentation and synthesis of the information and data identified in Steps 1 through 3 (no additional study) or Steps 1 through 6 (additional study). In this step, risk is evaluated and characterized using both quantitative and qualitative methods. Conclusions are made as to whether there is a reasonable potential for unacceptable ecological risk and, if there is a potential for unacceptable ecological risk, the magnitude of that risk. The results of the completed BERA (Step 7) are used to make necessary risk management decisions (Step 8) related to current or future risks. Possible decisions include:

- Adequate information exists to conclude that no unacceptable ecological risks exist. The assessment should stop at Step 7.
- Adequate information exists to conclude that unacceptable ecological risks exist for which remedial actions or controls are warranted. Whether remedial actions or controls are taken, and the specific actions or controls taken, will depend upon a number of risk management factors such as the results of human health risk assessments (if applicable) and the potential impact of the remedial action or control itself on the habitats and biota present. This analysis would occur as part of Step 8.
- Adequate information does not exist to estimate risk or the risk estimate is believed to be too conservative or uncertain to recommend remediation. The assessment should be refined.

1.2 Problem Formulation

Problem formulation establishes the goals, scope, and focus of the ERA. As part of problem formulation, the ecological setting of Laguna La Chiva is characterized in terms of the habitats and biota known or likely to be present. The types and concentrations of chemicals that are present in ecologically relevant media (surface soil and sediment) are also described based upon available analytical data. A conceptual site model is developed that describes source areas, transport pathways and exposure media, exposure pathways and routes, and receptors. Assessment endpoints, measurement endpoints, and risk hypotheses are developed to evaluate those receptors for which critical exposure pathways exist. The fate, transport, and toxicological properties of the chemicals present at Laguna La Chiva, particularly the potential for bioaccumulation, are also considered during this process.

1.2.1 Ecological Setting

Laguna La Chiva is an approximately 11 acre estuarine lagoon located just north of Playa La Chiva (a.k.a., Blue Beach) and south of Solid Waste Management Unit (SWMU 1) (**Figure D-1**). Under current conditions

the hydrologic connection to the Caribbean Sea at the southern end of the lagoon is blocked by a large accumulation of sand at Playa La Chiva, and this appears to be a well established barrier to the sea that is infrequently breached by strong storm events. The interior of the lagoon contains extensive shallow water and large exposed mud flats and salt flats. Historically this lagoon was dominated by mangroves, but gradual decreases in mangrove cover have occurred over time, possibly the result of long term blocked circulation with the sea which can result in increased lagoon salinity and adverse effects on some mangrove species.

Habitats and Biota

The general habitats at Laguna La Chiva include the open water lagoon, fringe mudflats and salt flats, and the upland perimeter.

A qualitative survey of wildlife, aquatic biota, and general water quality conditions in Laguna La Chiva was conducted in March, 2012. Additional wildlife observations were made during the environmental sampling event conducted March 13 through 17, 2013. Much of the lagoon contains open shallow water, typically less than 12 inches. A deeper channel, averaging about 5 feet deep, occurs at the southwestern end of the lagoon. This channel was blocked at the southern terminus at the beach by a large sand plug during each visit. Field water quality parameters were measured at a few stations; dissolved oxygen ranged from 4.90 to 6.61 mg/L, temperature ranged from 26.38 to 26.56 °C, salinity ranged from 38.86 to 39.45 parts per thousand (ppt), and pH ranged from 7.69 to 7.71 standard units. Several species of fish were observed or captured by cast net including snook (*Centropomus* sp.), tarpon (*Megalops atlanticus*), ladyfish (*Elops saurus*), white mullet (*Mugil curema*), and mojarra (*Eucinostomus* spp.). Some blue crabs (*Calinectes sapidus*) were observed in shallow water, and fiddler crabs (*Uca* sp.) were extremely abundant in shallow water and mudflats throughout the lagoon. Aquatic birds were relatively common and included clapper rail (*Rallus longirostris*), pied-billed grebe (*Podilymbus podiceps*), greater yellowlegs (*Tringa melanoleuca*), lesser yellowlegs (*Tringa flavipes*), stilt sandpiper (*Calidris himantopus*), spotted sandpiper (*Actitis macularius*), black-bellied plover (*Pluvialis squatarola*), ruddy turnstone (*Arenaria interpres*), Wilson's plover (*Charadrius wilsonia*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), green heron (*Butorides virescens*), and common gallinule (*Gallinula galeata*). The white-cheeked pintail (*Anas bahamensis*) has also been observed occasionally.

The low-lying fringe of the lagoon contains a mix of unvegetated mud and salt flats, areas of dense saltwort (*Batis maritima*), and patchy areas of black mangrove (*Avicennia germinans*) and some white mangrove (*Laguncularia racemosa*). Red mangroves (*Rhizophora mangle*) are only found lining the deeper channel at the southern end of the lagoon, and there is extensive evidence of remnant dead mangroves in many areas of the lagoon.

Historically the vegetative community within the upland perimeter of Laguna La Chiva has been heavily disturbed, and as a result the habitat is now dominated by low-growing, thick thorn scrub. The more common plant species include acacia (*Acacia* sp.), mesquite (*Prosopis juliflora*), white leadtree (*Leucaena glauca*), and box-briar (Randia aculeata). Common birds observed include common ground dove (*Columba passerina*), red-tailed hawk (Buteo jamaicensis), Caribbean elaenia (*Elaenia martinica*), gray kingbird (*Tyrannus dominicensis*), bananaquit (*Coerba flaveola*), black-faced grassquit (*Tiaris bicolor*), yellow warbler (*Dendroica petechia*), greater Antillean grackle (*Quiscalis niger*), and Antillean crested hummingbird (*Orthorynchus cristatus*). The small Indian mongoose (*Herpestes auropunctatus*) has been observed occasionally. Land crab (*Cardisoma guanhumi*) burrows occur along most of the upland lagoon perimeter.

Rare, Threatened, and Endangered Species

Thirteen federally listed species are known to occur, or have the potential to occur, on or near NASD Vieques (**Table D-1**). None of these plants or animals have been identified within Laguna La Chiva, and designated critical habitat is not present at this site.

The white-cheeked pintail is not federally listed, but is considered rare in Puerto Rico. This species has been observed occasionally foraging within the lagoon.

1.2.2 Summary of Available Analytical Data

Laguna La Chiva samples evaluated in the ERA are listed in **Table D-2**, and their locations are shown on **Figure D-1**. The analytical data sets for these samples are included in Appendix A of the No Action Decision Document - Laguna La Chiva.

Laguna La Chiva is represented by samples collected from 12 surface sediment stations (0-6 inches) throughout the lagoon, with subsurface sediment (6-12 inches) collected at 4 of these stations. The ERA evaluated potential risk to surface sediment samples only; subsurface sediment data was collected only to support an evaluation of past releases to the lagoon. No surface water samples were collected. Surface soil was collected at 4 stations along the lagoon upland fringe from 0 to 12 inches, and from 3 stations further inland within land crab habitat (0-24 inches). Physical parameter measurements for sediment and soil samples are presented in **Table D-3**.

1.2.3 Conceptual Site Model

The conceptual site model relates potentially exposed receptor populations with potential source areas based upon physical site characteristics and complete exposure pathways. Important components of the conceptual site model are the identification of potential source areas, transport pathways, exposure media, exposure pathways and routes, and receptors. Actual or potential exposures of ecological receptors associated with a site are determined by identifying the most likely, and most important, mechanisms and pathways of contaminant release and transport. A complete exposure pathway has three components: (1) a source of chemicals that results in a release to the environment; (2) a pathway of chemical transport through an environmental medium; and (3) an exposure or contact point for an ecological receptor. **Figure D-2** illustrates a diagrammatic conceptual site model for Laguna La Chiva. Key components of this conceptual site model are discussed in the following subsections.

Potential Source Areas

In October 2007, NOAA collected three sediment samples from Laguna La Chiva as part of an island-wide sediment evaluation (NOAA, 2010). Pesticide concentrations (primarily DDT, DDE, and DDD) were detected at concentrations higher than at other lagoons on Vieques sampled by NOAA and the Navy and above various ecological screening levels commonly used on Vieques.

It is possible that the pesticide concentrations detected in lagoon sediment are the result of normal pesticide use associated with historic military training at and adjacent to Blue Beach. Blue Beach was one of the two most frequently used beaches for amphibious landing training (TAMS, 1979). Though there are no records available, it is likely that pesticides were used to control insects during training events, especially in and around the lagoon, which would likely have been (and still is) prime mosquito habitat. Rusted pieces of several drums were observed around the lagoon, with the majority being observed on the northeast and west banks of the northwestern branch of the lagoon. Since pesticides would likely have been stored and transported in drums, the drum remnants offer another potential explanation for the source of pesticides in the lagoon (i.e., discarding of drums containing pesticide residues). The drums may also be the source of contaminants not previously analyzed for in Laguna La Chiva sediment samples (i.e., volatile organic compounds (VOCs) and semi-volatile organic compounds [SVOCs]). However, historical aerial photography does not show the area to have been used for disposal.

Although the SWMU 1 landfill is hydraulically upgradient from the Laguna La Chiva and pesticides were detected in the ephemeral stream samples collected adjacent to the landfill, no pesticides were detected in ephemeral stream samples collected closest to Laguna La Chiva. In addition, all of the pesticide concentrations detected in the ephemeral stream samples adjacent to the landfill were orders of magnitude below the levels detected in the lagoon. Further, no VOCs attributable to the SWMU 1 landfill were detected in ephemeral stream samples collected adjacent to the landfill. Two polycyclic aromatic hydrocarbons (PAHs) and bis(2-ethylhexyl)phthalate were detected in the ephemeral stream samples, but all detections were below regulatory screening levels. No VOCs or SVOCs were detected in the ephemeral stream samples

closest to Laguna La Chiva. All of this information suggests the landfill is not a source of the pesticides detected in the lagoon (or VOCs and SVOCs potentially present in the lagoon) or, at a minimum, is no longer a source.

In summary, potential source areas associated with Laguna La Chiva include:

- Normal pesticide use in and around the lagoon associated with historic military training activities.
- Materials contained in discarded drums.
- Upgradient SWMU 1 landfill.

Transport Pathways and Exposure Media

A transport pathway describes the mechanisms whereby site-related chemicals, once released, may be transported from a source to ecologically relevant media (such as surface water) where exposures may occur. These transport pathways are shown on **Figure D-2** and include:

- Pesticides historically sprayed on land surfaces surrounding the lagoon could have been transported via overland flow (runoff) to the lagoon. In addition, direct application of the pesticides to the low-lying areas of the lagoon may have occurred to control mosquitoes.
- Leakage from deteriorated drums potentially containing pesticide residues or other chemicals (such as chemicals containing VOCs and SVOCs) into the lagoon.
- Runoff from upgradient SWMU 1 landfill.

Exposure media for ecological receptors at Laguna La Chiva include:

- Surface sediment: 0 - 6 inches.
- Surface soil: 0 - 12 inches around the upland fringe of Laguna La Chiva, and 0-24 inches in adjacent land crab habitat.

Air is not addressed in this ERA since this medium is not likely to result in significant contributions to total exposures.

Exposure Pathways and Routes

An exposure pathway links a source of contamination with one or more receptors through exposure via one or more media and exposure routes. Exposure, and thus potential risk, can only occur if complete exposure pathways exist. **Figure D-2** shows the potentially complete exposure pathways to ecological receptors at Laguna La Chiva.

Potentially complete exposure pathways exist for aquatic receptors exposed to sediment in Laguna La Chiva. Receptor groups evaluated in this ERA include fish, aquatic invertebrates, aquatic plants, birds, and mammals. Since Laguna La Chiva is a saltwater lagoon, there is no complete aquatic exposure pathway to amphibians which require freshwater for egg laying and growth of tadpoles.

Potentially complete exposure pathways exist for terrestrial receptors exposed to surface soil around the perimeter of Laguna La Chiva. Receptor groups evaluated in this ERA include terrestrial plants, soil invertebrates, reptiles, birds, and mammals. Land crabs may also be exposed to deeper (up to 24 inches) surface soil within uplands near the Laguna La Chiva fringe.

An exposure route describes the specific mechanism(s) by which a receptor is exposed to a chemical present in an environmental medium. The most common exposure routes are dermal contact, direct uptake, ingestion, and inhalation. Terrestrial plants may be exposed to chemicals present in surface soils through their root surfaces during water and nutrient uptake. Unrooted, floating aquatic plants, rooted submerged vascular aquatic plants, and algae may be exposed to chemicals directly from the water or (for rooted plants) from sediment. Terrestrial and aquatic invertebrates may be exposed to chemicals in surface soil, surface sediment, and/or surface water through dermal contact and ingestion.

Animals may be exposed to chemicals through the: (1) inhalation of gaseous chemicals or of chemicals adhered to airborne particulate matter; (2) incidental ingestion of contaminated abiotic media (soil and/or sediment) during feeding or preening activities; (3) ingestion of contaminated water; (4) ingestion of contaminated plant and/or animal tissues for chemicals that have entered food webs; and/or (5) dermal contact with contaminated abiotic media. These routes, where applicable, are depicted on **Figure D-2**.

Direct contact is the primary exposure route for lower trophic level receptors (e.g., plants; aquatic and soil invertebrates) at the site. Incidental ingestion of sediment and exposure via aquatic food webs are the primary exposure routes for upper trophic level receptors (e.g., wading birds) in the lagoon. Incidental ingestion of soil and exposure via terrestrial food webs are the primary exposure routes for upper trophic level receptors (e.g., omnivorous birds) in the terrestrial habitats of Laguna La Chiva. The following pathways are not evaluated for wildlife receptors in the ERA:

- The contribution to the total dose from the inhalation route is generally insignificant for upper trophic level ecological receptors relative to ingestion pathways. Thus, the air (inhalation) pathway was not evaluated for ecological receptors.
- Direct ingestion of drinking water is only considered when a permanent or semi-permanent source of water with a salinity below 15 parts per thousand (ppt), the approximate toxic threshold for wildlife receptors (Humphreys, 1988), exists on a site. Based upon available data, the average salinity in Laguna La Chiva is 39 ppt, which is above this threshold. Thus, exposure via direct ingestion of drinking water was not included in the ERA.
- Exposure to chemicals present in surface soil and surface sediment via dermal contact may occur but is unlikely to represent a major exposure pathway for most upper trophic level receptors because fur or feathers minimize transfer of chemicals across dermal tissue. Thus, dermal contact was not evaluated for upper trophic level receptors in the ERA. Incidental ingestion of surface soil or surface sediment during feeding, preening, or grooming activities was, however, considered in the risk estimates. Direct contact was considered for lower trophic level receptors (soil and benthic invertebrates).

Endpoints and Risk Hypotheses

The conclusion of the problem formulation includes the selection of ecological endpoints and risk hypotheses, which are based upon the conceptual model. Two types of endpoints, assessment endpoints and measurement endpoints, are defined as part of the ERA process (USEPA, 1997a). An assessment endpoint is an explicit expression of the environmental component or value that is to be protected. A measurement endpoint is a measurable ecological characteristic that is related to the component or value chosen as the assessment endpoint. The considerations for selecting assessment and measurement endpoints are summarized in USEPA (1997a) and discussed in detail in Suter (1989, 1990, 1993). Risk hypotheses are testable hypotheses about the relationship among the assessment endpoints and their predicted responses when exposed to contaminants.

Endpoints define ecological attributes that are to be protected (assessment endpoints) and measurable characteristics of those attributes (measurement endpoints) that can be used to gauge the degree of impact that has or may occur. Assessment endpoints most often relate to attributes of biological populations or communities, and are intended to focus the risk assessment on particular components of the ecosystem that could be adversely affected by chemicals attributable to a site (USEPA, 1997a). Assessment endpoints contain an entity (e.g., heron population) and an attribute of that entity (e.g., survival rate). Individual assessment endpoints usually encompass a group of species or populations (the receptor) with some common characteristic, such as specific exposure route or contaminant sensitivity, with the receptor then used to represent the assessment endpoint in the risk evaluation.

Assessment and measurement endpoints may involve ecological components from any level of biological organization, from individual organisms to the ecosystem itself. Effects on individual organisms are important for some receptors, such as rare and endangered species; population- and community-level

effects are typically more relevant to ecosystems. Population- and community-level effects are usually difficult to evaluate directly without long-term and extensive study. However, measurement endpoint evaluations at the individual level, such as an evaluation of the effects of chemical exposure on reproduction, can be used to predict effects on an assessment endpoint at the population or community level. In addition, use of criteria values designed to protect the majority of the components of a community can be useful in evaluating potential community- and/or population-level effects.

Table D-4 shows the assessment endpoints, risk hypotheses, and measurement endpoints used in the ERA. **Table D-4** also shows the receptors associated with each endpoint.

1.3 Exposure Assessment

The principal activity associated with the exposure assessment is the estimation of chemical concentrations in applicable media, termed exposure point concentrations (EPCs), to which the receptors may be exposed. This is accomplished through the selection of appropriate sets of the available analytical data using a set of criteria (e.g., validation status, sampling date). Once the analytical data sets are selected, EPCs are calculated as a particular point on the distribution of concentrations. At the screening level (Step 2), the EPC is the maximum detected concentration. At the baseline level (Step 3A), EPCs are central tendency estimates (e.g., arithmetic mean). EPCs are then used in bioaccumulation and food web models to estimate exposures to upper trophic level receptors.

For conservatism, the maximum (SERA) and mean (BERA) reporting limits for chemicals analyzed for but not detected were also compared to medium-specific ESVs and (where applicable) used for food web exposure modeling. This was done to determine if reporting limits were less than chemical concentrations at which potential adverse effects to ecological receptors may occur.

1.3.1 Selection Criteria for Analytical Data

Available analytical data (described in Section 1.2.2) were selected for use in the ERA based upon the following:

- Data must have been validated by a qualified data validator using acceptable data validation methods. Rejected (R) values were not used in the ERA. Unqualified data and data qualified as J (estimated) were treated as detected. Data qualified as U (undetected) were treated as non-detected.
- For samples with duplicate analyses, the higher of the two concentrations was used when both values were detects or when both values were non-detects. In cases where one result was a detect and the other a non-detect, the detected value was used in the assessment.
- For non-detected results, the limit of detection (LOD) was used to represent the concentration. When calculating statistics (e.g., arithmetic mean), one-half of the LOD was used for non-detected results.

1.3.2 Data Groupings

Surface soil and surface sediment data were partitioned into the following spatial groups:

- **Site Surface Soil** – soil samples collected from 0 - 12 inches and 0-24 inches across the terrestrial habitats surrounding Laguna La Chiva.
- **Surface Sediment (lagoon)** – all surface sediment samples collected from throughout Laguna La Chiva from a depth of 0 - 6 inches.

Background UTLs from the East Vieques background study (CH2M HILL, 2007) were used for initial comparison to the soil samples collected from the lagoon fringe area.

1.3.3 Exposure Point Concentrations

At the screening level (SERA; Step 2) for direct exposures, the EPC was the maximum detected concentration. At the baseline level (BERA; Step 3A) for direct exposures, the EPC was a central tendency

estimate (arithmetic mean and the 95 percent upper confidence limit [UCL] of the arithmetic mean), which provides a more representative estimate of potential exposures and risks to receptor populations (which are the focus of the selected assessment endpoints). These three EPCs were also used in bioaccumulation and food web models to estimate exposures to upper trophic level receptors. Dietary items for which tissue concentrations were modeled included terrestrial and aquatic plants, benthic invertebrates, soil invertebrates, small mammals, and fish.

Incidental ingestion of surface soil and surface sediment, but not ingestion of drinking water (due to the high salinity of the lagoon), was included when calculating the total exposure. The models and parameter values used for calculating these tissue concentrations are outlined in the following subsections.

Not all chemicals were evaluated for food web exposures. Only those chemicals with the potential to bioaccumulate to a significant extent, as defined in **Table 4-2** of USEPA (2000), were evaluated. This list of bioaccumulating chemicals is provided in **Table D-5** for chemicals relevant to the Laguna La Chiva, and is based upon the list and selection process outlined in the final ERA Protocol (CH2M HILL, 2010a).

For the screening (SERA) exposure estimates, the uptake of chemicals from the abiotic media into food items was based upon conservative (e.g., 90th percentile) bioconcentration factors (BCFs) or bioaccumulation factors (BAFs) from the literature, where available. The 90th percentile is generally recommended to provide for a conservative screening assessment (Sample et al., 1998a; 1998b; Bechtel Jacobs, 1998). If 90th percentile values were not available in the cited reference, the maximum value was used, if available. If only central tendency (e.g., median) values were reported, they were used for both the SERA and BERA. Where an individual study (as opposed to a compilation of multiple studies) was cited, the best available value was sometimes a single value or the derivation was not specified. Default (assumed) factors of 1.0 were used only when data were not readily available for a chemical in the literature.

BCFs and BAFs used for baseline (BERA) exposure estimates were based upon, or modeled from, central tendency estimates (e.g., median or mean). Baseline values considered both the distribution of the data (e.g., normal or log normal) and the recommendations in the cited reference. Geometric means were preferred for log normal distributions and arithmetic means for normal distributions. In some cases, neither distribution was applicable or the distribution was biased by an outlying value. In these cases, point estimates like the median were then considered. Where an individual study (as opposed to a compilation of multiple studies) was cited, the best available value was sometimes a single value or the derivation was not specified. Default (assumed) factors of 1.0 were used only when data were not readily available for a chemical in the literature.

In the baseline assessment, using central tendency estimates (rather than high-end values or maximums) for exposure parameters such as BAFs provides a more representative estimate of potential exposures and risks to receptor populations (which are the focus of the selected assessment endpoints) of upper trophic level receptors. Since these upper trophic level species are highly mobile, they would be expected to effectively average their exposure over time as they forage within the area defining their home range. Average prey concentrations are most appropriately estimated using central tendency estimates of media concentrations and accumulation factors. For example, the wildlife dietary exposure models contained in the *Wildlife Exposure Factors Handbook* (USEPA, 1993) specify the calculation of an average daily dose. Increasing the representativeness of the exposure estimates relative to population-level effects is consistent with the intent of the BERA. In cases where adequate spatial sampling coverage exists, mean concentrations are also appropriate for evaluating potential risks to populations of lower trophic level receptors because the members of the population are expected to be found throughout a site (where suitable habitat is present), rather than concentrated in one particular area. While effects on individual organisms might be important for some receptors, such as rare and endangered species, population- and community-level effects are typically more relevant to ecosystems.

Terrestrial Plants

Tissue concentrations in the above-ground vegetative portion of terrestrial plants were estimated by multiplying the maximum (SERA) or mean (BERA) surface soil concentration for each bioaccumulative chemical by chemical-specific soil-to-plant BAFs obtained from the literature. These BAFs, for both the SERA and BERA, are listed in **Table D-6**. For the SERA (Step 2) and BERA (Step 3A), the algorithms listed in **Table D-7** were the preferred method for deriving pesticide BAFs.

The BAF values used were based upon root uptake from soil and upon the ratio between dry-weight soil and dry-weight plant tissue. Literature values based upon the ratio between dry-weight soil and wet-weight plant tissue were converted to a dry-weight basis by dividing the wet-weight BAF by an estimated solids content for terrestrial plants (15 percent [0.15]; Sample et al., 1997).

Soil Invertebrates (Earthworms)

Tissue concentrations in soil invertebrates (earthworms) were estimated by multiplying the maximum (SERA) or mean (BERA) surface soil concentration for each bioaccumulative chemical by chemical-specific soil-to-invertebrate BCFs or BAFs obtained from the literature. These BCF/BAF values, for both the SERA and BERA, are listed in **Table D-8**. For the SERA, the point estimate BAFs in **Table D-8** (screening set) were the preferred values. For the BERA, the algorithms listed in **Table D-7**, if available for a chemical, were the preferred method for deriving BAFs, followed by the point-estimate BAFs in **Table D-8** (baseline set).

BCFs are calculated by dividing the concentration of a chemical in earthworm tissue by the concentration of that same chemical in the surrounding environmental medium (in this case, soil) without accounting for uptake via the diet. BAFs consider both direct exposure to soil and exposure via the diet. Because earthworms consume soil, BAFs are more appropriate values and were used when available. BAFs based upon depurated analyses (soil was purged from the gut of the earthworm prior to analysis) were given preference over undepurated analyses when selecting BAF values because direct ingestion of soil is accounted for separately in the food web model.

The BCF/BAF values selected were based upon the ratio between dry-weight soil and dry-weight earthworm tissue. Literature values based upon the ratio between dry-weight soil and wet-weight earthworm tissue were converted to a dry-weight basis by dividing the wet-weight BCF/BAF by the estimated solids content for earthworms (16 percent [0.16]; USEPA, 1993). For chemicals without available measured BAFs/BCFs, an earthworm BAF was estimated using available regression equations from the literature, was estimated using data for similar chemicals, or a BAF of 1.0 was assumed.

Small Mammals

Whole-body tissue concentrations in small mammals (omnivores) were estimated using one of two methodologies. For chemicals with literature-based soil-to-small mammal BAFs, the small mammal tissue concentration was calculated by multiplying the maximum (SERA) or mean (BERA) surface soil concentration for each bioaccumulative chemical by a chemical-specific soil-to-small mammal BAF obtained from the literature. These BAF values, for both the SERA and BERA, are listed in **Table D-9**. For the SERA and the BERA, the algorithms listed in **Table D-7** were the preferred method for deriving pesticide BAFs.

The BAF values selected were based upon the ratio between dry-weight soil and whole-body dry-weight tissue. Literature values based upon the ratio between dry-weight soil and wet-weight tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for small mammals (32 percent [0.32]; USEPA, 1993).

For chemicals without soil-to-small mammal BAF values or algorithms, an alternate approach was used to estimate whole-body tissue concentrations. Because most chemical exposure for these small mammals is via the diet, it was assumed that the concentration of each bioaccumulative chemical in the small mammal's tissues was equal to the chemical concentration in its diet multiplied by a diet to whole-body BAF derived from the literature. The small mammal tissue concentration was calculated as follows:

$$TC_x = [[\sum_i (FC_{xi})(PDF_i)] + [(SC_x)(PDS)]] (BAF_{diet\text{-}whole\ body})$$

where:	TC_x	=	Small mammal tissue concentration for chemical x (mg/kg, dry weight)
	FC_{xi}	=	Concentration of chemical x in food item i (mg/kg, dry weight)
	PDF_i	=	Proportion of diet composed of food item i (dry weight basis)
	SC_x	=	Concentration of chemical x in soil (mg/kg, dry weight)
	PDS	=	Proportion of diet composed of soil (dry weight basis)
	BAF	=	Diet to whole-body BAF (unitless)

This equation is basically a weighted average of the chemical concentration in the various dietary components (including soil ingestion) for the small mammal (rat), multiplied by a diet-to-whole body BAF, and thus excludes water ingestion.

For chemicals lacking diet to whole-body BAF values (not to be confused with the soil-to-small mammal BAFs listed in T**able D-9**), a diet to whole-body BAF of one was assumed. The use of a diet to whole-body BAF of one is likely to result in a conservative estimate of chemical concentrations for chemicals that are not known to biomagnify in terrestrial food webs and a reasonable estimate of chemical concentrations for chemicals that are known to bioaccumulate or biomagnify, based upon reported literature values. For example, a maximum diet to whole-body BAF value of 1.0 was reported by Simmons and McKee (1992) for PCBs based upon laboratory studies with white-footed mice. Menzie et al. (1992) reported diet to whole-body BAF values for DDT of 0.3 for voles and 0.2 for short-tailed shrews. Reported diet to whole-body BAF values for dioxin were only slightly above one (1.4) for the deer mouse (USEPA, 1990).

Aquatic Plants

Tissue concentrations in the above-ground vegetative portion of rooted wetland/aquatic plants were estimated by multiplying the surface sediment concentration for each chemical by chemical-specific soil-to-plant BCFs (extrapolated to sediments) obtained from the literature (see Section 1.3.3.1).

The BCF values were based upon root uptake from sediment and upon the ratio between dry-weight sediment and dry-weight plant tissue. Literature values based upon the ratio between dry-weight sediment and wet-weight plant tissue were converted to a dry-weight basis by dividing the wet-weight BCF by the estimated solids content for plants (15 percent [0.15]; Sample et al., 1997).

Benthic Invertebrates

Tissue concentrations in benthic invertebrates were estimated by multiplying the maximum (SERA) or mean (BERA) sediment concentration for each chemical by chemical-specific sediment-to-invertebrate BAF or biota-sediment accumulation factor (BSAF) values obtained from the literature. BSAF (wet weight) values were converted to BAF values (dry weight) for use in the food web models using the percent lipid and percent solid values listed in T**able D-10**, and the mean measured site-specific TOC from the lagoon (4.56 percent). These values, for both the SERA and BERA, are listed in **Table D-10**. For the SERA, the point estimate BAFs in **Table D-10** (screening set) were the preferred values. For the BERA, the algorithms listed in **Table D-7**, if available for a chemical, were the preferred method for deriving BAFs, followed by the point-estimate BAFs in **Table D-10** (baseline set).

The BAF values selected were based upon the ratio between dry-weight sediment and dry-weight invertebrate tissue. BAFs based upon depurated analyses (sediment was purged from the gut of the organism prior to analysis) were given preference over undepurated analyses when selecting BAF values because direct ingestion of sediment is accounted for separately in the food web model. However, in some cases, the depurated data set was limited or highly variable, and the pooled or undepurated data were then considered.

Literature values based upon the ratio between dry-weight sediment and wet-weight invertebrate tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for benthic invertebrates (21 percent [0.21]; USEPA, 1993). For chemicals without available measured BAFs, a BAF was estimated using available regression equations from the literature, was estimated using data for similar chemicals, or a BAF of 1.0 was assumed.

Fish

Tissue concentrations in whole-body fish were estimated by multiplying the maximum (SERA) or mean (BERA) sediment concentration for each chemical by chemical-specific sediment-to-fish BAF or biota-sediment accumulation factor (BSAF) values obtained from the literature. BSAF (wet weight) values were converted to BAF values (dry weight) for use in the food web models using the percent lipid and percent solid values listed in **Table D-11**, and the mean measured site-specific TOC from the lagoon (4.56 percent). These values, for both the SERA (screening set) and BERA (baseline set), are listed in **Table D-11**.

The BAF values were based upon the ratio between dry-weight sediment and dry-weight fish tissue. Literature values based upon the ratio between dry-weight sediment and wet-weight fish tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for fish (25 percent [0.25]; USEPA, 1993). For chemicals without literature-based sediment-to-fish BAFs, a BAF was estimated using data for similar chemicals or a BAF of 1.0 was assumed.

1.3.4 Dietary Intakes

Upper trophic level receptor exposures via food webs to chemicals present in surface soil and surface sediment were determined using estimated chemical concentrations in each relevant dietary component for each upper trophic level receptor, as described in the previous section. Incidental ingestion of surface soil and surface sediment was also included when calculating the total exposure. Drinking water exposures were not included (were set to zero) due to the high salinity of the lagoon.

Dietary intakes for each upper trophic level receptor were calculated using the following formula (modified from USEPA [1993]):

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

where:

DI_x	=	Dietary intake for chemical x (mg chemical/kg body weight/day)
FIR	=	Food ingestion rate (kg/day, dry-weight)
FC_{xi}	=	Concentration of chemical x in food item i (mg/kg, dry-weight)
PDF_i	=	Proportion of diet composed of food item i (dry-weight basis)
SC_x	=	Concentration of chemical x in soil or sediment (mg/kg, dry-weight)
PDS	=	Proportion of diet composed of soil or sediment (dry-weight basis)
WIR	=	Water ingestion rate (L/day)
WC_x	=	Concentration of chemical x in water (mg/L)
BW	=	Body weight (kg, wet-weight)

Incidental ingestion of soil/sediment was modeled as a dietary component rather than using a separate soil/sediment ingestion rate. Water ingestion was set to zero. Parameter values for the selected receptors are listed in **Tables D-12** (screening) and **D-13** (baseline). When measured food ingestion rates were not available for a receptor from the literature, the rates were estimated using allometric equations from Nagy (2001).

The exposure parameter values were selected to provide for a conservative evaluation at the screening level (Step 2). Examples of these conservative assumptions include:

- All of the dietary items consumed by the receptor are obtained from the site (i.e., an Area Use Factor [AUF] of one was assumed) at the point of maximum concentration.
- Chemicals are 100 percent bioavailable.
- Maximum food ingestion rates were used (calculated maximum ingestion rates using allometric equations were based upon the maximum adult body weight).
- Minimum adult body weights were used. The selection focused on the most geographically appropriate values available from standard literature sources (e.g., USEPA, 1993).
- Exclusive diets (composed of one primary prey item) were used.

For the baseline (Step 3A) estimates:

- Central tendency estimates (e.g., mean, median, or midpoint) for adult body weight and ingestion rates were used, as were more realistic dietary compositions. Central tendency estimates for these exposure parameters are more relevant for a BERA because they better represent the characteristics of a greater proportion of the individuals in the population. Populations or communities (rather than individual organisms) were emphasized when developing the assessment endpoints for the ERA.
- An AUF of 1.0 was retained in Step 3A.

1.4 Effects Assessment

The purpose of the effects assessment is to establish chemical exposure levels (screening values) that represent conservative thresholds for adverse ecological effects. One set of screening values is developed for each selected assessment endpoint. Based upon the conceptual model, direct exposure to surface soil and sediment, and exposure via terrestrial and aquatic food webs, are the complete pathways at the site.

The effects assessment defines the methods and data used to define an adverse ecological effect. For this ERA, effects data are available from multiple lines of evidence, as follows:

- **Ecological Screening Values (ESVs) for Sediment and Surface Soil** - Analytical data are compared to the medium-specific ESVs developed in Section 1.4.1.
- **Toxicity Reference Values (TRVs) for Ingestion Exposures** - Food web exposure estimates are compared to ingestion-based TRVs developed in Section 1.4.2 for upper trophic level receptors.

In addition, an initial comparison of site surface soil pesticide concentrations to east Vieques background concentrations was conducted as an additional line of evidence (see Section 1.5).

1.4.1 Medium-Specific ESVs

Medium-specific ESVs were established for each ecologically relevant medium. Based upon the conceptual site model (**Figure D-2**), direct exposure to surface sediment and surface soil are potentially complete pathways. Based upon the salinity of the lagoon, marine ESVs were used. The ESVs used in the ERA are summarized, by medium, in **Tables D-14 and D-15**.

Potential risks to upper trophic level receptors from food web exposures (tissue residues) were evaluated separately using the ingestion-based TRVs outlined in Section 1.4.2.

Measures of chemical bioavailability are also considered in this ERA. Equilibrium partitioning (EqP), which incorporates a measure of sediment chemical bioavailability, is appropriate for developing sediment effect levels for non-ionic (non-polar) organic chemicals (USEPA, 1993; 1996a). EqP theory holds that a non-ionic chemical present in sediment partitions between sediment organic carbon, interstitial (pore) water, and benthic organisms. For these types of chemicals, it has been demonstrated that biological effects are correlated not to the total concentration of a chemical in bulk sediment but to the pore water concentration. Thus, effect levels based on water-only exposures (such as AWQC values) can be used to

estimate potential biological effects from sediment exposures when coupled with a measure of the ratio of the concentration in pore water to the concentration in sediment organic carbon (the organic carbon partition coefficient, K_{oc}) using the following formula (USEPA, 1996a; 1999):

$$EqPValue = (f_{oc})(K_{oc})(FCV)$$

where:	EqP Value	=	Equilibrium partitioning-based value (μg/kg)
	f_{oc}	=	Total organic carbon content (percent, as a fraction)
	K_{oc}	=	Normalized adsorption (partition) coefficient (L/kg)
	FCV	=	Chronic AWQC or its equivalent (μg/L)

The sorption capacity of the sediment is determined by the mass fraction of organic carbon present in the sediment (f_{oc} or TOC). For sediments with a f_{oc} of greater than 0.2 percent by weight, the organic carbon appears to be the predominant determinant for chemical sorption. Thus, the amount of organic carbon present in the sediment controls the bioavailability of a non-ionic chemical through sorption. In general, the higher the organic carbon content of the sediment, the lower the bioavailability of the chemical. By using the measured site-specific organic carbon content of a sediment in the above equation, the site-specific bioavailability and toxicity of non-ionic chemicals can be evaluated. Literature based marine sediment EqP values, as documented in the final ERA Protocol (CH2M HILL, 2010a), are provided in **Table D-16**. For non-ionic organic chemicals analyzed in site sediment but not listed in **Table D-16**, EqP values were calculated in the Step 3A assessment using the equation above. These EqP values, which are all based on 1 percent TOC, can be adjusted (normalized) to site-specific TOC values as appropriate to derive site-specific ESVs.

1.4.2 Ingestion TRVs

Ingestion TRVs for dietary exposures were derived for each bioaccumulative chemical evaluated in the ERA. TRVs were derived for both mammalian and avian upper trophic level receptors, the only two taxonomic groups for which sufficient toxicological information was generally available for the range of bioaccumulative chemicals evaluated. Toxicological information from the literature for wildlife species most closely related to the receptor species were used, where available, but were supplemented by laboratory studies of non-wildlife species (e.g., laboratory mice) where necessary. The ingestion TRVs are expressed as milligrams of the chemical per kilogram body weight of the receptor per day (mg/kg-BW/day).

Survival, growth, and reproduction were emphasized as toxicological endpoints because they are the most relevant, ecologically, to maintaining viable populations and because they are generally the most studied toxicological endpoints for ecological receptors. Endpoints based upon reproduction were generally preferred to those based upon growth which were preferred to those based upon survival. If several chronic toxicological studies were available from the literature, the most appropriate study was selected for each receptor species based upon study design, study methodology, study duration, study endpoint, and test species.

Ingestion TRVs were derived for both chronic No Observed Adverse Effect Level (NOAEL) and chronic Lowest Observed Effect Level (LOAEL) endpoints. The applicable uncertainty factors from **Table D-17** were used to derive these TRVs where appropriate (uncertainty factors were not generally applied to TRVs obtained from Eco-SSL documents because these TRVs often encompassed multiple studies). Because assessment endpoints were based upon population- or community-level effects, no intraspecies uncertainty factors were applied. Taxonomic class-type uncertainty factors were also not applied because the TRVs selected were typically derived based upon data from a broad range of taxonomic groups. Maximum Acceptable Toxicant Concentrations (MATCs), defined as the geometric mean of the NOAEL and LOAEL, were also calculated.

In terrestrial habitats, Step 2 food web COPCs were selected by first comparing maximum soil concentrations with the lower of the available bird and mammal Eco-SSLs (**Table D-18**). Chemicals that exceeded the Eco-SSLs based upon the maximum soil concentration were retained for site-specific food web modeling. Those that did not were not evaluated further for terrestrial food web exposures. The final Step 2

food web COPCs were selected based upon a comparison of maximum exposure doses from site-specific food web modeling with the NOAEL-based ingestion TRV. Those chemicals with an exposure dose exceeding the NOAEL-based ingestion TRV were identified as Step 2 COPCs. For Step 3A, ingestion-based (food web) COPCs were based upon a comparison of mean exposure doses with ingestion TRVs based upon the NOAEL, MATC, and LOAEL. An exceedance of the MATC was considered an unacceptable effect at Step 3A, although chemicals that exceed the MATC, but not the LOAEL, were discussed for possible risk management considerations.

Ingestion TRVs for mammals and birds are provided in **Tables D-19 and D-20**, respectively. Where more than one value is shown for a chemical in these tables, the value used for each receptor is specified.

1.5 Risk Characterization

The risk characterization portion of the ERA uses the information generated during the three previous parts of the ERA (problem formulation, exposure assessment, and effects assessment) to estimate potential risks to ecological receptors at the level of conservatism applied (screening or baseline).

1.5.1 Methodology

The methodology used for the risk characterization, per the final ERA protocol, is described in the following two subsections for the SERA (Step 2) and BERA (Step 3A).

SERA Approach

The main objective of risk characterization at the screening level (termed risk calculation) is to derive a list of COPCs. As part of this risk calculation, the maximum exposure concentrations (abiotic media) or maximum exposure doses (upper trophic level receptors) are compared with the corresponding ESVs or TRVs to derive risk estimates using the hazard quotient (HQ) method. HQs are calculated by dividing the chemical concentration in the medium being evaluated by the corresponding medium-specific ESV, or by dividing the exposure dose by the corresponding ingestion-based TRV. HQs equaling or exceeding one indicate the potential for unacceptable risk since the chemical concentration or dose (exposure) equals or exceeds the ESV or TRV (effect); these chemicals are identified as COPCs at Step 2. However, ESVs/TRVs and exposure estimates are derived using intentionally conservative assumptions at the screening level such that HQs greater than or equal to one do not necessarily indicate that unacceptable risks are present. Rather, it identifies chemical-pathway-receptor combinations requiring further evaluation using more realistic exposure scenarios and assumptions. Following the same reasoning, HQs less than one indicate that unacceptable risks are unlikely, enabling a conclusion of negligible (acceptable) risk to be reached with high confidence.

In addition to chemicals that exceeded medium-specific ESVs based upon maximum detected concentrations, or that exceeded TRVs based upon maximum ingestion doses, the following also applied to COPC selection at Step 2:

- Non-detected chemicals were retained as COPCs if the maximum detection limit exceeded the ESV for that medium or if the ingestion dose calculated using the maximum detection limit exceeded the TRV.
- All detected chemicals lacking a TRV and/or ESV were retained as COPCs.

BERA Approach

COPCs from the SERA are reevaluated in the first step of the BERA (Step 3A). As discussed previously, this reevaluation involves using more realistic assumptions about exposures and a comparison of these revised exposure estimates (based upon central tendency estimates of media concentrations, BAFs, and exposure parameters) with ESVs and TRVs.

In addition to chemicals that exceeded medium-specific ESVs based upon mean detected concentrations, or that exceeded TRVs based upon mean ingestion doses, the following also applied to COPC selection at Step 3A:

- All detected chemicals lacking a TRV and/or ESV were retained as COPCs for risk evaluation.
- Ingestion-based (food web) COPCs were based upon a comparison of mean and 95% UCL exposure doses with ingestion TRVs based upon the NOAEL, MATC, and LOAEL. An exceedance of the MATC was generally considered an unacceptable effect at Step 3A, although chemicals that exceed the MATC, but not the LOAEL, were discussed for possible risk management considerations.

For Step 3A, the following additional factors were also considered, as appropriate:

- **Vieques-Wide Background Concentrations.** Vieques-wide background concentrations from the East Vieques background study (CH2M HILL, 2007) were also considered in the reevaluation for surface soil. The background evaluation consisted of a direct comparison of site surface soil concentrations to the maximum pesticide concentrations in the background study (**Table D-21**), in a manner analogous to the comparison to ESVs.
- In addition, concentrations of pesticides detected in soil elsewhere on Vieques and attributed to normal pesticide use were identified and compared to Laguna La Chiva pesticide data.

1.5.2 Terrestrial Habitat – Laguna La Chiva Surface Soil

Laguna La Chiva surface soil samples are compared with soil ESVs and used to calculate food web exposures.

Comparison with Soil ESVs

Maximum, mean, and 95% UCL Laguna La Chiva surface soil concentrations are compared to soil ESVs for plants and soil invertebrates in **Table D-22**. **Table D-22** also contains a comparison against background pesticides that exceeded soil ESVs in at least one sample.

SERA (Step 2)

Maximum surface soil concentrations are compared to ESVs in **Table D-22**. Based upon this comparison, DDE had a HQ exceeding one based upon the maximum detected concentration and was identified as a Step 2 COPC.

The pesticide DDT was not detected but the maximum detection limit exceeded the ESV and was therefore identified as a Step 2 COPC.

BERA (Step 3A)

Mean concentrations in surface soil are compared to ESVs in **Table D-22**. **Table D-22** also contains a comparison to background values for the Step 2 pesticide COPCs. The maximum detection limit for DDT did not exceed background. The mean HQ for DDE exceeded one and DDE also exceeded background. Thus, DDE was identified as a COPC for further risk evaluation.

Food Web Exposures

Chemicals with available bird and/or mammal Eco-SSLs were first screened against these Eco-SSLs (**Table D-23**). Those chemicals exceeding the Eco-SSLs based upon the maximum surface soil concentration, which included DDD, DDE, and DDT, were retained for site-specific food web modeling.

SERA (Step 2)

HQs based upon maximum exposure doses for each upper trophic level terrestrial receptor are listed in **Table D-24** (calculations are shown in Attachment 1). Based upon a comparison to NOAELs, three pesticides (DDD, DDE, and DDT) had HQs exceeding one for one or more receptors. The exceedances for DDD and DDT were based upon reporting limits.

BERA (Step 3A)

HQs based upon 95 percent UCL exposure doses for each upper trophic level terrestrial receptor are listed in **Table D-25** (calculations are shown in Attachment 1). Based upon a comparison to NOAELs, only DDE had a HQ exceeding one for at least one receptor.

HQs based upon mean exposure doses for each upper trophic level terrestrial receptor are listed in **Table D-26** (calculations are shown in **Attachment 1**). DDE had a HQ that exceeded one based upon the MATC (for the velvet free-tailed bat), the defined threshold for a potential adverse effect in the final ERA protocol. The HQ based upon the LOAEL also exceeded one for the velvet free-tailed bat. DDE was retained as a COPC for further risk evaluation for terrestrial food web exposures.

1.5.3 Aquatic Habitat – Laguna La Chiva Sediment

Sediment samples from Laguna La Chiva were compared with ESVs, and sediment samples were used to calculate food web exposures.

Comparison With Sediment Screening Values

Maximum, mean, and 95% UCL sediment concentrations associated with Laguna La Chiva are compared to marine sediment ESVs in **Table D-27**.

SERA (Step 2)

Maximum sediment concentrations are compared to ESVs in **Table D-27.** Based upon this comparison, three pesticides (DDD, DDE, and DDT) had HQs exceeding one based upon maximum detected concentrations and were identified as Step 2 COPCs. Four VOCs (2-butanone, acetone, bromoform, and carbon disulfide) were detected but ESVs were not available. These four chemicals were also identified as Step 2 COPCs.

Two VOCs and 20 SVOCs were not detected but maximum detection limits exceeded ESVs. These 22 chemicals were also identified as Step 2 COPCs.

BERA (Step 3A)

Mean sediment concentrations are compared to ESVs in **Table D-27**. Based upon this comparison, three pesticides (DDD, DDE, and DDT) had HQs exceeding one based upon mean detected concentrations and were identified as Step 3 COPCs.

Four VOCs (2-butanone, acetone, bromoform, and carbon disulfide) were detected but ESVs were not available. These four chemicals were also identified as Step 3 COPCs.

The Step 3A COPCs were reevaluated based upon bioavailability considerations (EqP). These organic COPCs are compared with EqP-based ESVs in **Table D-28**, which have been adjusted for the site specific mean TOC of 4.56 percent. HQs based upon mean concentrations exceed one for carbon disulfide, which was therefore retained as the only Step 3A COPC.

Food Web Exposures

Food web exposures were evaluated for the lagoon based upon surface sediment concentrations. The evaluations of all VOCs and SVOCs were based upon maximum detection limits as these chemicals were not detected in lagoon sediment samples. Due to the salinity of the lagoon, surface water samples were not considered as drinking water.

SERA (Step 2)

HQs based upon maximum exposure doses for each upper trophic level aquatic receptor are listed in **Table D-29** (calculations are shown in Attachment 2). Based upon a comparison to NOAELs, DDD, and DDE had HQs exceeding one for one or more receptors.

BERA (Step 3A)

HQs based upon 95 percent UCL exposure doses and mean exposure doses for each upper trophic level aquatic receptor are listed in **Tables D-30 and D-31**, respectively (calculations are shown in Attachment 2). Based upon a comparison to NOAELs, none of the chemicals had a HQ exceeding one for any receptor.

1.5.4 Risk Evaluation

In this section, the various lines of evidence discussed in the previous section are integrated in order to evaluate the potential for unacceptable risks.

Terrestrial Habitats

Ten assessment endpoints were developed for terrestrial habitats at Laguna La Chiva (**Table D-4**). Lines of evidence for terrestrial habitats included: (1) comparison of surface soil concentrations with ESVs; (2) comparison of modeled dietary doses with ingestion TRVs; and (3) comparison of site surface soil concentrations with concentrations of pesticides detected in soil elsewhere on Vieques and attributed to normal pesticide use

The pesticides DDD, DDE, and DDT were the only parameters analyzed in the 7 surface soil samples surrounding Laguna La Chiva. DDD and DDT were not detected in any sample, and DDE was detected in only one sample. DDE was identified as a Step 3A COPC in surface soil (Section 1.5.2.1). Concentrations of pesticides detected in soil elsewhere on Vieques and attributed to normal pesticide use were considered in this risk evaluation. The maximum concentration of DDE detected in Vieques soils and attributed to normal pesticide use is 3,990 µg/kg, a value based on the record of decision (ROD) for Area of Concern (AOC) H which presented a no action determination indicating there is no unacceptable risk over that of background to human health or the environment under current or potential future site use. At AOC H, DDE was detected in 22 of 32 surface soil samples ranging from 1.4 to 3,990 µg/kg. The maximum DDE concentration is greater than the maximum soil concentration of DDE (2,300 µg/kg) at Laguna La Chiva. Thus, considering that the maximum (and only) detected concentration of DDE in soil around Laguna La Chiva is within the range of concentrations detected in soil on Vieques and attributed to normal pesticide use, DDE was not identified as a COC for directly exposed plants, invertebrates, and reptiles.

DDE was retained as a COPC for further risk evaluation for terrestrial food web exposures. Seven terrestrial wildlife receptors were evaluated, however only the exposure pathway of the velvet free-tailed bat consuming aerial insects from the surrounding upland habitat indicated a potential risk. The mean soil concentration of DDE resulted in a HQ of 2.32 based upon the MATC, however the LOAEL HQ was only slightly above one (1.04). There is a high degree of uncertainty in estimating chemical concentrations in the tissues of aerial insects that have emerged from upland soils and are consumed by insectivorous bats (free-tailed bat) using standard invertebrate uptake models, which typically do not consider the emergent forms of invertebrates. In addition, DDE was detected at only 1 of 7 locations in the upland habitat surrounding the lagoon, thus DDE is potentially exposed to only a localized population of soil insects, which when emerged would likely contribute a fraction of the total dietary DDE exposure to insectivorous bats, compared with the 100 percent dietary exposure assumed in the Step 3A food web model. Finally, as previously discussed, the maximum (and only) detection of DDE in soil was below that of AOC H where a no action ROD was established. Thus, considering the low range of HQs, conservativeness of the food web model, and soil concentration within the range of concentrations detected in soil on Vieques and attributed to normal pesticide use, DDE was not identified as a terrestrial food web COC (that is, for birds, mammals, and reptiles).

In conclusion, no unacceptable risks were identified for terrestrial receptors associated with Laguna La Chiva.

Aquatic Habitats

Nine assessment endpoints were developed for aquatic habitats at Laguna La Chiva (**Table D-4**). Lines of evidence for aquatic habitats included: (1) comparison of sediment concentrations with ESVs and EqPs; and (2) comparison of modeled dietary doses with ingestion TRVs.

In sediment, carbon disulfide was identified as a Step 3A COPC in Laguna La Chiva (see 1.5.3.1) based upon detected concentrations exceeding the EqP. The maximum detected concentration of carbon disulfide (51.0 µg/kg), as well as the 95% UCL (24.7 µg/kg) and arithmetic mean (17.4 µg/kg), were greater than the EqP value (3.88 µg/kg); the arithmetic mean HQ equals 4.49. Carbon disulfide was detected in 9 of 12 site sediment samples. Historic military training in the vicinity of Laguna La Chiva occurred from about the mid 1950s to the 1970s. Though it is possible that limited amounts of carbon disulfide could have been released during military training activities, other factors such as its high volatility, age of the site (over 30 years), low affinity for sorption to organic substances (log K_{oc} = 1.79) such that it is unlikely to partition to or remain in sediment, and an estimated half-life in sediment of 7.4 months (Abrams et. al., 1975), provide evidence that site-related carbon disulfide is unlikely present. Carbon disulfide is known to be produced naturally by sediment microorganisms in wetlands, and Laguna La Chiva is a large, inundated estuarine wetland with a perimeter of mangroves and other marine wetland vegetation. It is therefore reasonable to expect naturally produced, low levels of carbon disulfide in site sediment. For these reasons, carbon disulfide was not considered to be a COC.

The Step 3A food web evaluation did not identify any COPCs, therefore no COCs resulted.

In conclusion, no unacceptable risks were identified for aquatic receptors associated with the Laguna La Chiva.

1.5.5 Risk Summary and Conclusions

No COCs were identified for surface soil or sediment exposures at Laguna La Chiva. Similarly, no COCs were identified for food web exposures. Thus, risks to ecological receptors are considered acceptable under current site conditions.

1.6 Uncertainties

Uncertainties are present in all risk assessments because of the limitations of the available data and the need to make certain assumptions and extrapolations based on incomplete information. In addition, the use of various models (e.g., uptake and food web exposures) carries with it some associated uncertainty as to how well the model reflects actual conditions. Since conservative assumptions were generally used in the exposure and effects assessments, these uncertainties are more likely to result in an overestimation rather than an underestimation of the likelihood and magnitude of risks to ecological receptors. The uncertainties in this ERA are mainly attributable to the following factors:

- **Reporting Limits** - Reporting limits for some undetected analytes exceeded applicable ESVs in sediment media. **Table D-32** summarizes these constituents and reports both the ratio of the minimum and maximum reporting limits to the ESV as well as the ratio of the mean value (calculated using one-half of the reporting limit for each sample) to the ESV. Because these constituents were not detected, they are not known to be present on the site but the potential for unacceptable risks cannot be totally discounted because the reporting limits are higher than the ESVs. The magnitude of the ratios can be used to qualitatively evaluate the magnitude of the associated uncertainty (e.g., there is more uncertainty in terms of the potential for risk for a ratio of 100 relative to a ratio of 10).

  In surface soil, 15 chemicals had mean ratios above one, ranging from 1.5 to 83. Nine of these ratios were less than 10, while the remaining 6 had ratios ranging from 18 to 83. Because standard analytical methods were used and the sample reporting limits were not elevated relative to the method reporting limits for the vast majority of samples and analytes, these uncertainties are considered acceptable and are unlikely to impact the conclusions of the ERA.

- **Duplicate Analyses** - When evaluating samples with field duplicates, the value used in the ERA was always the detect when one result was a detect and the duplicate was a non-detect, regardless of whether or not the non-detected value was higher. In these cases, the use of the detect has less uncertainty since it represents an actual measured value (versus an upper limit bound) and the two samples will have identical or similar reporting limits.
- **Selection of COPCs** - Chemicals without available ESVs for a medium were not retained as COPCs for risk evaluation unless they were detected. These uncertainties are unlikely to impact the conclusions of the ERA since these chemicals are not known to be present on the site.
- **Ingestion TRVs** - Data on the toxicity of many chemicals to the receptor species were sparse or lacking, requiring the extrapolation of data from other wildlife species or from laboratory studies with non-wildlife species. This is a typical limitation and extrapolation for ERAs because so few wildlife species have been tested directly for most chemicals. The uncertainties associated with toxicity extrapolation were minimized through the selection of the most appropriate test species for which suitable toxicity data were available. The factors considered in selecting a test species to represent a receptor species included taxonomic relatedness, trophic level, foraging method, and similarity of diet. It is difficult to predict if these extrapolations would result in overestimating or underestimating potential risks.
- **Chemical Mixtures** - Information on the toxicological effects of chemical interactions is generally lacking for ecological receptors, which required (as is standard for ERAs) that the chemicals be evaluated on a compound-by-compound basis during the comparison to ESVs. This could result in an underestimation of risk (if there are additive or synergistic effects among chemicals) or an overestimation of risks (if there are antagonistic effects among chemicals).
- **Receptor Species Selection** - Reptiles were selected as receptors in the ERA, but were not evaluated quantitatively even when exposure pathways were likely to be complete. For food web exposures, this taxon was evaluated using other fauna (birds and mammals) as surrogates due to the general lack of taxon-specific toxicological data. This represents an uncertainty in the ERA.

  It was also assumed that any reptiles present in the aquatic habitats adjacent to the site were not exposed to significantly higher concentrations of chemicals and were not more sensitive to chemicals than other receptor species evaluated in the ERA. This assumption was a source of uncertainty in the ERA. In addition, there is some uncertainty associated with the use of specific receptor species to represent larger groups of organisms (e.g., guilds).
- **Food Web Exposure Modeling** - Chemical concentrations in aquatic food items (plants, benthic invertebrates, and fish) were modeled from measured sediment concentrations and were not directly measured. Chemical concentrations in terrestrial food items (plants, earthworms, and small mammals) were modeled from measured surface soil concentrations and were not directly measured. The use of generic, literature-derived exposure models and bioaccumulation factors introduces some uncertainty into the resulting estimates. The values selected and methodology employed were intended to provide a conservative (SERA) or reasonable (Step 3A) estimate of potential food web exposure concentrations.

  Another source of uncertainty is the use of default assumptions for exposure parameters such as BCFs and BAFs. Although BCFs or BAFs for many bioaccumulative chemicals were readily available from the literature and were used in the ERA, the use of a default factor of 1.0 to estimate the concentration of some chemicals in receptor prey items is a source of uncertainty.

  There is a high degree of uncertainty in estimating chemical concentrations in the tissues of aerial insects that are consumed by insectivorous bats (free-tailed bat) and birds (cave swallow) using standard invertebrate uptake models, which typically do not consider the emergent forms of invertebrates. As a result, the concentrations of lipophilic chemicals (i.e., organochlorine pesticides, VOCs, and SVOCs) estimated in emergent insects may be overestimated or underestimated in the food web evaluations.

Area use factors were assumed to equal one. This is a conservative assumption since a significant percentage of each upper trophic level receptor species' time could be spent foraging off-site in unimpacted areas or in areas where chemical concentrations are expected to be significantly lower.

- **Mean Versus Maximum Media Concentrations** - As is typical in an ERA, a finite number of samples of environmental media are used to develop the exposure estimates. The maximum measured concentration provides a conservative estimate for immobile biota or those with a limited home range. The most realistic exposure estimates for mobile species with relatively large home ranges and for species populations (even those that are immobile or have limited home ranges) are those based upon the mean chemical concentrations in each medium to which these receptors are exposed. This is reflected in the wildlife dietary exposure models contained in the *Wildlife Exposure Factors Handbook* (USEPA, 1993), which specify the use of average media concentrations. Given the mobility of the upper trophic level receptor species used in the ERA, the use of maximum chemical concentrations (rather than mean concentrations) in the SERA to estimate the exposure via food webs is very conservative. This conservatism was reduced to more realistic levels in the values selected for use in the Step 3A evaluation.
- **Comparisons to Background Concentrations** - Background concentrations were used to judge the site-relatedness of individual chemicals in surface soil. If site concentrations were consistent with background levels, it was assumed that the concentrations were not related to known site-related source areas. There exists the possibility that concentrations below background were indeed site-related, rendering the assumption false. However the potential impact of this possibility is minimal since chemicals at concentrations consistent with background should exhibit no different ecological effects than commonly occurring in areas not affected by releases, regardless of their source.

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Tables

TABLE D-1
Federally Listed Species Occurring or Potentially Occurring at NASD Vieques
Laguna La Chiva, Vieques, Puerto Rico

Scientific Name (Common Name)	Federal Status
Plants	
Chaemacrista glandulosa var. mirabilis (Herb)	Endangered
Stahlia monosperma (Cobana negra)	Threatened
Calyptranthes thomasiana (Thomas' lidflower)	Endangered
Eugenia woodburyana (Evergreen tree)	Endangered
Goetzea elegans	Endangered
Reptiles and Amphibians	
Chelonia mydas (Green sea turtle)	Threatened
Dermochelys coriacea (Leatherback sea turtle)	Endangered
Eretmochelys imbricata (Hawksbill sea turtle)	Endangered
Caretta caretta (Loggerhead sea turtle)	Threatened
Birds	
Sterna dougalli dougalli (Roseate tern)	Threatened
Mammals	
Physeter macrocephalus (Sperm whale)	Endangered
Megaptera novaeangliae (Humpback whale)	Endangered
Trichechus manatus (West Indian manatee)	Endangered

Source: Vieques Integrated Natural Resource Plan, Plan Years 2003 - 2012 (Geo-Marine 2003)

TABLE D-2
Samples Used in the Ecological Risk Assessment
Laguna La Chiva, Vieques, Puerto Rico

Station ID	Sample ID	Date	Sampled Depth Range (feet)
SWMU 6 - Onsite Samples			
Surface Sediment - Laguna La Chiva			
VENO-SD01	VENO-SD01-000H	5/15/2013	0 - 0.5
VENO-SD01	VENO-SD01P-000H	5/15/2013	0 - 0.5
VENO-SD02	VENO-SD02-000H	5/15/2013	0 - 0.5
VENO-SD03	VENO-SD03-000H	5/15/2013	0 - 0.5
VENO-SD04	VENO-SD04-000H	5/17/2013	0 - 0.5
VENO-SD05	VENO-SD05-000H	5/17/2013	0 - 0.5
VENO-SD06	VENO-SD06-000H	5/17/2013	0 - 0.5
VENO-SD07	VENO-SD07-000H	5/17/2013	0 - 0.5
VENO-SD07	VENO-SD07P-000H	5/17/2013	0 - 0.5
VENO-SD08	VENO-SD08-000H	5/16/2013	0 - 0.5
VENO-SD09	VENO-SD09-000H	5/16/2013	0 - 0.5
VENO-SD10	VENO-SD10-000H	5/16/2013	0 - 0.5
VENO-SD11	VENO-SD11-000H	5/16/2013	0 - 0.5
VENO-SD12	VENO-SD12-000H	5/15/2013	0 - 0.5
Soil - Laguna La Chiva			
VENO-SO01	VENO-SS01-0002	5/14/2013	0 - 2.0
VENO-SO01	VENO-SS01P-0002	5/14/2013	0 - 2.0
VENO-SO02	VENO-SS02-0001	5/16/2013	0 - 1.0
VENO-SO03	VENO-SS03-0001	5/16/2013	0 - 1.0
VENO-SO04	VENO-SS04-0001	5/14/2013	0 - 1.0
VENO-SO05	VENO-SS05-0002	5/14/2013	0 - 2.0
VENO-SO06	VENO-SS06-0001	5/16/2013	0 - 1.0
VENO-SO07	VENO-SS07-0002	5/14/2013	0 - 2.0

Shaded cells indicate field duplicates

TABLE D-3
Physical Sediment and Soil Parameter Measurements - Laguna La Chiva
Laguna La Chiva, Vieques, Puerto Rico

StationID	Depth (ft)	SampleID	Sample Date	pH (SU)	Total Organic Carbon (mg/kg)	Gravel (%)	Sand (%)	Silt/Clay (%)
Surface Sediment - Laguna La Chiva								
VENO-SD01	0 - 0.5	VENO-SD01-000H	5/15/2013	7.70	32,000	0.00	0.7	99.3
VENO-SD02	0 - 0.5	VENO-SD02-000H	5/15/2013	7.80	48,000	0.00	1.9	98.1
VENO-SD03	0 - 0.5	VENO-SD03-000H	5/15/2013	8.00	47,000	0.00	1.5	98.5
VENO-SD04	0 - 0.5	VENO-SD04-000H	5/17/2013	7.30	100,000	0.50	11.0	88.5
VENO-SD05	0 - 0.5	VENO-SD05-000H	5/17/2013	7.50	47,000	0.00	0.3	99.7
VENO-SD06	0 - 0.5	VENO-SD06-000H	5/17/2013	7.50	38,000	0.00	0.6	99.4
VENO-SD07	0 - 0.5	VENO-SD07-000H	5/17/2013	7.70	4,500	0.00	93.3	6.7
VENO-SD08	0 - 0.5	VENO-SD08-000H	5/16/2013	7.60	70,000	0.00	3.5	96.5
VENO-SD09	0 - 0.5	VENO-SD09-000H	5/16/2013	8.10	44,000	0.00	0.7	99.3
VENO-SD10	0 - 0.5	VENO-SD10-000H	5/16/2013	7.80	26,000	0.00	0.6	99.4
VENO-SD11	0 - 0.5	VENO-SD11-000H	5/16/2013	7.80	36,000	0.00	0.3	99.7
VENO-SD12	0 - 0.5	VENO-SD12-000H	5/15/2013	8.00	55,000	0.00	1.3	98.7
			Average	7.73	45,625	0.04	9.64	90.3
Subsurface Sediment - Laguna La Chiva								
VENO-SD01	0.5 - 1.0	VENO-SD01-0H01	5/15/2013	7.50	22,000	0.1	0.6	99.3
VENO-SD02	0.5 - 1.0	VENO-SD02-0H01	5/15/2013	7.80	28,000	0.0	0.7	99.3
VENO-SD04	0.5 - 1.0	VENO-SD04-0H01	5/17/2013	7.50	67,000	0.0	2.8	97.2
VENO-SD11	0.5 - 1.0	VENO-SD11-0H01	5/16/2013	8.10	20,000	0.0	0.2	99.8
			Average	7.73	34,250	0.03	1.08	98.9
Soil - Laguna La Chiva								
VENO-SO01	0 - 2.0	VENO-SS01-0002	5/14/2013	8.10	14,000	0.0	83.0	17.0
VENO-SO02	0 - 1.0	VENO-SS02-0001	5/16/2013	7.60	10,000	0.0	4.5	95.5
VENO-SO03	0 - 1.0	VENO-SS03-0001	5/16/2013	7.50	8,900	0.0	0.4	99.6
VENO-SO04	0 - 1.0	VENO-SS04-0001	5/14/2013	8.20	13,000	0.0	16.4	83.6
VENO-SO05	0 - 2.0	VENO-SS05-0002	5/14/2013	7.70	22,000	0.0	85.1	14.9
VENO-SO06	0 - 1.0	VENO-SS06-0001	5/16/2013	7.80	17,000	0.0	13.2	86.8
VENO-SO07	0 - 2.0	VENO-SS07-0002	5/14/2013	7.80	24,000	0.1	84.4	15.5
			Average	7.81	15,557	0.01	41.0	59.0

NS - Not Sampled
mg/kg - milligram per kilogram
SU - standard units

TABLE D-4
Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints
Laguna La Chiva, Vieques, Puerto Rico

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Terrestrial Habitats			
Survival, growth, and reproduction of terrestrial soil invertebrate communities	Are site-related chemical concentrations in surface soil sufficient to adversely effect soil invertebrate communities?	Comparison of maximum (SERA) and mean (BERA) chemical concentrations in surface soil with soil screening values; including soil samples from a depth of 0 - to 24 inches for land crab exposures	Soil invertebrates
Survival, growth, and reproduction of terrestrial plant communities	Are site-related chemical concentrations in surface soil sufficient to adversely effect terrestrial plant communities?	Comparison of maximum (SERA) and mean (BERA) chemical concentrations in surface soil with soil screening values	Terrestrial plants
Survival, growth, and reproduction of terrestrial reptile populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to terrestrial reptile populations?	Due to limited toxicological information for reptiles, comparison of maximum (SERA) and mean (BERA) chemical concentrations in surface soil with soil screening values for other terrestrial biota (plants and soil inverebrates). Evidence of potential risk to other upper trophic level terrestrial receptors evaluated in the ERA (birds and mammals used as surrogates)	Reptiles
Survival, growth, and reproduction of avian terrestrial invertivore (SERA)/ omnivore (BERA) populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume soil invertebrates (SERA) or terrestrial plants and soil invertebrates (BERA) from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface soil concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Pearly-eyed thrasher
Survival, growth, and reproduction of avian terrestrial herbivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume terrestrial plants from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface soil concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Common ground dove
Survival, growth, and reproduction of avian aerial insectivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume soil invertebrates from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface soil concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Cave swallow

TABLE D-4
Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints
Laguna La Chiva, Vieques, Puerto Rico

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Survival, growth, and reproduction of avian terrestrial carnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume small mammals from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface soil concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Red-tailed hawk
Survival, growth, and reproduction of mammalian terrestrial herbivore (SERA)/ omnivore (BERA) populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume terrestrial plants (SERA) or terrestrial plants and soil invertebrates (BERA) from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface soil concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Norway rat
Survival, growth, and reproduction of mammalian terrestrial invertivore (SERA)/ omnivore (BERA) populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume soil invertebrates (SERA) or small mammals, soil invertebrates, and terrestrial plants (BERA) from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface soil concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Indian mongoose
Survival, growth, and reproduction of mammalian aerial insectivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume soil invertebrates from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface soil concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Velvet free-tailed bat
Aquatic Habitats			
Survival, growth, and reproduction of benthic invertebrate communities	Are site-related chemical concentrations in surface sediment sufficient to adversely effect benthic invertebrate communities?	Comparison of maximum (SERA) and mean (BERA) chemical concentrations in sediment with medium-specific screening values	Benthic invertebrates
Survival, growth, and reproduction of aquatic plant communities	Are site-related chemical concentrations in surface sediment sufficient to adversely affect aquatic plant communities?	Comparison of maximum (SERA) and mean (BERA) chemical concentrations in sediment with medium-specific screening values	Aquatic plants
Survival, growth, and reproduction of fish communities	Are site-related chemical concentrations in surface sediment sufficient to adversely effect fish communities?	Comparison of maximum (SERA) and mean (BERA) chemical concentrations in sediment with medium-specific screening values	Fish

TABLE D-4
Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints
Laguna La Chiva, Vieques, Puerto Rico

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Survival, growth, and reproduction of avian aquatic invertivore populations	Are site-related chemical concentrations in surface sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume benthic invertebrates from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface sediment concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Spotted sandpiper
Survival, growth, and reproduction of avian aquatic piscivore (SERA)/ piscivore/invertivore (BERA) populations	Are site-related chemical concentrations in surface sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume fish and invertebrates from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface sediment concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Green heron
Survival, growth, and reproduction of avian aquatic herbivore (SERA)/ herbivore/invertivore (BERA) populations	Are site-related chemical concentrations in surface sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume aquatic plants and invertebrates from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface sediment concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	White-cheeked pintail
Survival, growth, and reproduction of avian aerial insectivore populations	Are site-related chemical concentrations in surface sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume benthic invertebrates emerging from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface sediment concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Cave swallow
Survival, growth, and reproduction of mammalian aerial insectivore populations	Are site-related chemical concentrations in surface sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume invertebrates emerging from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface sediment concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Velvet free-tailed Bat
Survival, growth, and reproduction of mammalian aquatic piscivore populations	Are site-related chemical concentrations in surface sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume fish from the site?	Comparison of modeled dietary intakes using maximum (SERA) and mean (BERA) surface sediment concentrations with literature-based ingestion TRVs; maximum HQs >1 based upon the NOAEL (SERA) and mean HQs >1 based upon the MATC (BERA) indicate an effect	Fishing bat

TABLE D-5
Bioaccumulative Chemicals List and Log K_{ow} Values
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Log K_{ow} Range	Selected log K_{ow}	Reference
Pesticides			
4,4'-DDD	5.90 - 6.65	6.10	USEPA 1995a
4,4'-DDE	5.63 - 6.96	6.76	USEPA 1995a
4,4'-DDT	5.56 - 7.01	6.53	USEPA 1995a
Volatile and Semivolatile Organic Compounds			
1,1,2,2-Tetrachloroethane	2.31 - 2.64	2.39	USEPA 1995a
1,2,4,5-Tetrachlorobenzene	4.51 - 4.83	4.64	USEPA 1995a
1,2,4-Trichlorobenzene	3.89 - 4.23	4.01	USEPA 1995a
1,2-Dichlorobenzene	3.20 - 3.61	3.43	USEPA 1995a
1,3-Dichlorobenzene	Not reported	3.50	USEPA 1996b
1,4-Dichlorobenzene	3.26 - 3.62	3.42	USEPA 1995a
4-Bromophenyl-phenylether	4.89 - 5.24	5.00	USEPA 1995a
4-Chlorophenyl-phenylether	4.08 - 5.09	4.95	USEPA 1995a
Hexachlorobenzene	5.23 - 6.92	5.89	USEPA 1995a
Hexachlorobutadiene	4.74 - 5.16	4.81	USEPA 1995a
Hexachlorocyclopentadiene	5.05 - 5.51	5.39	USEPA 1995a
Hexachloroethane	3.82 - 4.14	4.00	USEPA 1995a
Pentachlorophenol	5.01 - 5.24	5.09	USEPA 1995a

Table D-6
Soil Bioconcentration Factors For Plants (Dry Weight)
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Screening (Step 2)			Baseline (Step 3A)		
	Value	Basis	Reference	Value	Basis	Reference
Pesticides						
4,4'-DDD	--	See Table D-7	--	--	See Table D-7	--
4,4'-DDE	--	See Table D-7	--	--	See Table D-7	--
4,4'-DDT	--	See Table D-7	--	--	See Table D-7	--
Volatile and Semivolatile Organic Compounds						
1,1,2,2-Tetrachloroethane	1.000	Assumed	--	1.000	Assumed	--
1,2,4,5-Tetrachlorobenzene	0.792	Calculated	USEPA 2007b (Figure 5B)	0.792	Calculated	USEPA 2007b (Figure 5B)
1,2,4-Trichlorobenzene	1.426	Calculated	USEPA 2007b (Figure 5B)	1.426	Calculated	USEPA 2007b (Figure 5B)
1,2-Dichlorobenzene	2.452	Calculated	USEPA 2007b (Figure 5B)	2.452	Calculated	USEPA 2007b (Figure 5B)
1,3-Dichlorobenzene	2.296	Calculated	USEPA 2007b (Figure 5B)	2.296	Calculated	USEPA 2007b (Figure 5B)
1,4-Dichlorobenzene	2.475	Calculated	USEPA 2007b (Figure 5B)	2.475	Calculated	USEPA 2007b (Figure 5B)
4-Bromophenyl-phenylether	0.566	Calculated	USEPA 2007b (Figure 5B)	0.566	Calculated	USEPA 2007b (Figure 5B)
4-Chlorophenyl-phenylether	0.593	Calculated	USEPA 2007b (Figure 5B)	0.593	Calculated	USEPA 2007b (Figure 5B)
Hexachlorobenzene	0.246	Calculated	USEPA 2007b (Figure 5B)	0.246	Calculated	USEPA 2007b (Figure 5B)
Hexachlorobutadiene	0.675	Calculated	USEPA 2007b (Figure 5B)	0.675	Calculated	USEPA 2007b (Figure 5B)
Hexachlorocyclopentadiene	0.393	Calculated	USEPA 2007b (Figure 5B)	0.393	Calculated	USEPA 2007b (Figure 5B)
Hexachloroethane	1.439	Calculated	USEPA 2007b (Figure 5B)	1.439	Calculated	USEPA 2007b (Figure 5B)
Pentachlorophenol	5.930	Median	USEPA 2007b (Table 4c)	5.930	Median	USEPA 2007b (Table 4c)

[1] Calculated as described in the text using the "selected" log K_{ow} from Table D-7.

TABLE D-7
Bioconcentration/Bioaccumulation Factor Models (Dry Weight)
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Plants[1]	Reference	Soil Invertebrates[2]	Reference	Small Mammal Omnivores	Reference	Benthic Invertebrates	Reference
Pesticides								
4,4'-DDD	$C_p = e^{(-2.5119 + 0.7524(\ln Cs))}$	USEPA 2007b (Table 4b)	$C_w = e^{(1.1613 + 0.6975(\ln Cs))}$	USEPA 2007b (Table 4b)	--	--	--	--
4,4'-DDE	$C_p = e^{(-2.5119 + 0.7524(\ln Cs))}$	USEPA 2007b (Table 4b)	$C_w = e^{(2.4771 + 0.8804(\ln Cs))}$	USEPA 2007b (Table 4b)	--	--	--	--
4,4'-DDT	$C_p = e^{(-2.5119 + 0.7524(\ln Cs))}$	USEPA 2007b (Table 4b)	$C_w = e^{(2.1247 + 0.8689(\ln Cs))}$	USEPA 2007b (Table 4b)	--	--	--	--

[1] Where C_p = Concentration in aboveground portion of plant (mg/kg dry wt) and C_s = Concentration in soil (mg/kg dry wt)

[2] Where C_w = Concentration in earthworm (mg/kg dry wt) and C_s = Concentration in soil (mg/kg dry wt)

TABLE D-8
Soil Bioaccumulation Factors For Soil Invertebrates (Dry Weight)
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Screening (Step 2)			Baseline (Step 3A)		
	Value	Basis	Reference	Value	Basis	Reference
Pesticides						
4,4'-DDD	11.2	Median	USEPA 2007b (Table 4b)	11.2	Median	USEPA 2007b (Table 4b)
4,4'-DDE	11.2	Median	USEPA 2007b (Table 4b)	11.2	Median	USEPA 2007b (Table 4b)
4,4'-DDT	11.2	Median	USEPA 2007b (Table 4b)	11.2	Median	USEPA 2007b (Table 4b)

TABLE D-9
Soil Bioaccumulation Factors For Small Mammals (Dry Weight) - Omnivores
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Screening (Step 2)			Baseline (Step 3A)		
	Value	Basis	Reference	Value	Basis	Reference
Pesticides						
4,4'-DDD	NA	--	See Section 1.3.3.3 (Small Mammals)	NA	--	See Section 1.3.3.3 (Small Mammals)
4,4'-DDE	NA	--	See Section 1.3.3.3 (Small Mammals)	NA	--	See Section 1.3.3.3 (Small Mammals)
4,4'-DDT	NA	--	See Section 1.3.3.3 (Small Mammals)	NA	--	See Section 1.3.3.3 (Small Mammals)

NA - Not Available

TABLE D-10

Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Benthic Invertebrates

Laguna La Chiva, Vieques, Puerto Rico

Chemical	Screening (Step 2)					
	BSAF (ww)	BAF (dw)[1]	Type	Principal Organisms	Basis	Reference
Pesticides						
4,4'-DDD	0.88	2.36	Marine/Estuarine	Worms	Single value	USACOE 2010
4,4'-DDE	0.88	2.36	Marine/Estuarine	Worms	Single value	DDD value
4,4'-DDT	0.16	0.43	Marine/Estuarine	Worms	90th percentile	USACOE 2010
Volatile and Semivolatile Organic Compounds						
1,1,2,2-Tetrachloroethane	1.00	1.00	--	--	Assumed	--
1,2,4,5-Tetrachlorobenzene	--	0.62	Fresh	Amphipods/oligochaetes	Maximum	Oliver and Niimi 1988
1,2,4-Trichlorobenzene	--	0.48	Fresh	Amphipods/oligochaetes	Maximum	Oliver and Niimi 1988
1,2-Dichlorobenzene	1.00	1.00	--	--	Assumed	--
1,3-Dichlorobenzene	1.00	1.00	--	--	Assumed	--
1,4-Dichlorobenzene	1.00	1.00	--	--	Assumed	--
4-Bromophenyl-Phenylether	1.00	1.00	--	--	Assumed	--
4-Chlorophenyl-Phenylether	1.00	1.00	--	--	Assumed	--
Hexachlorobenzene	--	0.86	Fresh	Amphipods/oligochaetes	Maximum	Oliver and Niimi 1988
Hexachlorobutadiene	--	0.61	Fresh	Amphipods/oligochaetes	Maximum	Oliver and Niimi 1988
Hexachlorocyclopentadiene	1.00	1.00	--	--	Assumed	--
Hexachloroethane	1.00	1.00	--	--	Assumed	--
Pentachlorophenol	1.00	1.00	--	--	Assumed	--

[1] Wet-weight (ww) BSAFs are converted to dry-weight (dw) using the following values:

Lipids (%):	1.48	bivalves	2.58	macroinvertebrates	USACOE 2010
TOC (%):	4.56	Mean measured (Laguna La Chiva)			
Percent soilds:	0.21	USEPA 1993a			

TABLE D-10
Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Benthic Invertebrates
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Baseline (Step 3A)					
	BSAF (ww)	BAF (dw)[1]	Type	Principal Organisms	Basis	Reference
Pesticides						
4,4'-DDD	0.88	2.36	Marine/Estuarine	Worms	Single value	USACOE 2010
4,4'-DDE	0.88	2.36	Marine/Estuarine	Worms	Single value	DDD value
4,4'-DDT	0.12	0.31	Marine/Estuarine	Worms	Median	USACOE 2010
Volatile and Semivolatile Organic Compounds						
1,1,2,2-Tetrachloroethane	1.00	1.00	--	--	Assumed	--
1,2,4,5-Tetrachlorobenzene	--	0.40	Fresh	Amphipods/oligochaetes	Mean	Oliver and Niimi 1988
1,2,4-Trichlorobenzene	--	0.26	Fresh	Amphipods/oligochaetes	Mean	Oliver and Niimi 1988
1,2-Dichlorobenzene	1.00	1.00	--	--	Assumed	--
1,3-Dichlorobenzene	1.00	1.00	--	--	Assumed	--
1,4-Dichlorobenzene	1.00	1.00	--	--	Assumed	--
4-Bromophenyl-Phenylether	1.00	1.00	--	--	Assumed	--
4-Chlorophenyl-Phenylether	1.00	1.00	--	--	Assumed	--
Hexachlorobenzene	--	0.51	Fresh	Amphipods/oligochaetes	Mean	Oliver and Niimi 1988
Hexachlorobutadiene	--	0.39	Fresh	Amphipods/oligochaetes	Mean	Oliver and Niimi 1988
Hexachlorocyclopentadiene	1.00	1.00	--	--	Assumed	--
Hexachloroethane	1.00	1.00	--	--	Assumed	--
Pentachlorophenol	1.00	1.00	--	--	Assumed	--

[1] Wet-weight (ww) BSAFs are converted to dry-weight (dw) using the following values:

Lipids (%):	1.48	bivalves	2.58	macroinvertebrates	USACOE 2010
TOC (%):	4.56	Mean measured (Laguna La Chiva)			
Percent soilds:	0.21	USEPA 1993a			

TABLE D-11
Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Fish
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Screening (Step 2)				
	BSAF (ww)	BAF (dw)[1]	Type	Basis	Reference
Pesticides					
4,4'-DDD	1.54	8.1	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
4,4'-DDE	17.3	91	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
4,4'-DDT	1.75	9.2	Fresh/Marine	90th percentile	USEPA 2009a; USACOE 2010
Volatile and Semivolatile Organic Compounds					
1,1,2,2-Tetrachloroethane	1.00	1.00	--	Assumed	--
1,2,4,5-Tetrachlorobenzene	0.036	0.19	Marine	Median	Parkerton et al. 1993
1,2,4-Trichlorobenzene	0.175	0.92	Marine	90th percentile	USEPA 2009a
1,2-Dichlorobenzene	0.112	0.59	Marine	Single value	USEPA 2009a
1,3-Dichlorobenzene	0.020	0.11	Marine	Single value	USEPA 2009a
1,4-Dichlorobenzene	0.014	0.07	Marine	Single value	USEPA 2009a
4-Bromophenyl-Phenylether	1.00	1.00	--	Assumed	--
4-Chlorophenyl-Phenylether	1.00	1.00	--	Assumed	--
Hexachlorobenzene	0.090	0.47	Fresh/Marine	Median	USEPA 1997b
Hexachlorobutadiene	0.036	0.19	Marine	Median	Parkerton et al. 1993
Hexachlorocyclopentadiene	1.00	1.00	--	Assumed	--
Hexachloroethane	1.00	1.00	--	Assumed	--
Pentachlorophenol	0.41	2.16	Marine	Median	Parkerton et al. 1993

[1] Wet-weight (ww) BSAFs are converted to dry-weight (dw) using the following values:

Lipids (%):	6	USEPA 1997a; USACOE 2010
TOC (%):	4.56	Mean measured (Laguna La Chiva)
Percent soilds:	0.25	USEPA 1993a

TABLE D-11
Biota Sediment Accumulation Factors (Wet Weight) and Sediment Bioaccumulation Factors (Dry Weight) for Fish
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Baseline (Step 3A)				
	BSAF (ww)	BAF (dw)[1]	Type	Basis	Reference
Pesticides					
4,4'-DDD	0.74	3.9	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
4,4'-DDE	1.22	6.4	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
4,4'-DDT	0.80	4.2	Fresh/Marine	Median	USEPA 2009a; USACOE 2010
Volatile and Semivolatile Organic Compounds					
1,1,2,2-Tetrachloroethane	1.00	1.00	--	Assumed	--
1,2,4,5-Tetrachlorobenzene	0.036	0.19	Marine	Median	Parkerton et al. 1993
1,2,4-Trichlorobenzene	0.132	0.69	Marine	Median	USEPA 2009a
1,2-Dichlorobenzene	0.112	0.59	Marine	Single value	USEPA 2009a
1,3-Dichlorobenzene	0.020	0.11	Marine	Single value	USEPA 2009a
1,4-Dichlorobenzene	0.014	0.07	Marine	Single value	USEPA 2009a
4-Bromophenyl-Phenylether	1.00	1.00	--	Assumed	--
4-Chlorophenyl-Phenylether	1.00	1.00	--	Assumed	--
Hexachlorobenzene	0.090	0.47	Fresh/Marine	Median	USEPA 1997b
Hexachlorobutadiene	0.036	0.19	Marine	Median	Parkerton et al. 1993
Hexachlorocyclopentadiene	1.00	1.00	--	Assumed	--
Hexachloroethane	1.00	1.00	--	Assumed	--
Pentachlorophenol	0.41	2.16	Marine	Median	Parkerton et al. 1993

[1] Wet-weight (ww) BSAFs are converted to dry-weight (dw) using the following values:

Lipids (%):	6	USEPA 1997a; USACOE 2010
TOC (%):	4.56	Mean measured (Laguna La Chiva)
Percent soilds:	0.25	USEPA 1993a

TABLE D-12
Exposure Parameters for Upper Trophic Level Ecological Receptors - Screening
Laguna La Chiva, Vieques, Puerto Rico

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)	
	Value	Reference	Value	Reference	Value	Reference
Birds						
Cave swallow (terrestrial)	0.0144	Dunning 2008 (minimum for male/female - Puerto Rico)	0.0042	allometric equation (USEPA 1993)[1]	0.0044	allometric equation (Nagy 2001)[3]
Cave swallow (aquatic)	0.0144	Dunning 2008 (minimum for male/female - Puerto Rico)	0.0042	allometric equation (USEPA 1993)[1]	0.0044	allometric equation (Nagy 2001)[3]
Common ground dove	0.0224	Dunning 2008 (minimum - Puerto Rico [gender not reported])	0.0070	allometric equation (USEPA 1993)[1]	0.0081	allometric equation (Nagy 2001)[4]
Green heron	0.138	Dunning 2008 (minimum for male/female - Caibbean)	0.0214	allometric equation (USEPA 1993)[1]	0.0257	allometric equation (Nagy 2001)[4]
Pearly-eyed thrasher	0.080	Dunning 2008 (minimum for male/female - Puerto Rico)	0.0157	allometric equation (USEPA 1993)[1]	0.0174	allometric equation (Nagy 2001)[3]
Red-tailed hawk	0.957	USEPA 1993 (lowest of 6 adult values [3 male/3 female])	0.0680	allometric equation (USEPA 1993)[1]	0.0395	Sample and Suter 1994
Spotted sandpiper	0.0294	Dunning 2008 (minimum - Pennsylvania [gender not reported])	0.0089	allometric equation (USEPA 1993)[1]	0.0105	allometric equation (Nagy 2001)[4]
White-cheeked pintail	0.402	Dunning 2008 (minimum for male/female - Suriname)	0.0434	allometric equation (USEPA 1993)[1]	0.0529	allometric equation (Nagy 2001)[4]
Mammals						
Fishing bat	0.0314	Silva and Downing 1995 (minimum for male/female - Trinidad/Tobago)	0.0103	allometric equation (USEPA 1993)[2]	0.0070	allometric equation (Nagy 2001)[7]
Indian mongoose	0.312	Silva and Downing 1995 (minimum for male/female - Puerto Rico)	0.0933	allometric equation (USEPA 1993)[2]	0.0460	allometric equation (Nagy 2001)[6]
Norway rat	0.168	Silva and Downing 1995 (minimum for male/female - Arkansas)	0.0516	allometric equation (USEPA 1993)[2]	0.0398	allometric equation (Nagy 2001)[5]
Velvet free-tailed bat (terrestrial)	0.0080	Silva and Downing 1995 (minimum for male/female - Virgin Islands)	0.0018	allometric equation (USEPA 1993)[2]	0.0019	allometric equation (Nagy 2001)[7]
Velvet free-tailed bat (aquatic)	0.0080	Silva and Downing 1995 (minimum for male/female - Virgin Islands)	0.0018	allometric equation (USEPA 1993)[2]	0.0019	allometric equation (Nagy 2001)[7]

1 - All birds equation: 0.059 $(BW)^{0.67}$ (maximum body weight used: thrasher - 0.138 kg; heron - 0.220 kg; hawk - 1.235 kg; sandpiper - 0.0598 kg; dove - 0.0412 kg; swallow - 0.0195 kg; pintail - 0.633 kg)
2 - All mammals equation: 0.099 $(BW)^{0.90}$ (maximum body weight used: rat - 0.485 kg; mongoose - 0.936 kg; free-tailed bat - 0.0117 kg; fishing bat - 0.0813 kg)
3 - Insectivorous birds equation: $(0.54*((BW*1000)^{0.705}))/1000$ (maximum body weight used: 0.138 kg)
4 - All birds equation: $(0.638*((BW*1000)^{0.685}))/1000$ (maximum body weight used: heron - 0.220 kg; sandpiper - 0.0598 kg)
5 - Rodent equation used: $(0.332*((BW*1000)^{0.774}))/1000$ (maximum body weight used - 0.485 kg)
6 - Carnivore equation used: $(0.153*((BW*1000)^{0.834}))/1000$ (maximum body weight used - 0.936 kg)
7 - Bat equation used: $(0.365*((BW*1000)^{0.617}))/1000$

TABLE D-12
Exposure Parameters for Upper Trophic Level Ecological Receptors - Screening
Laguna La Chiva, Vieques, Puerto Rico

Receptor	Dietary Composition (percent)							Soil/ Sediment Ingestion (percent)	
	Terrestrial Plants	Soil Invertebrates	Small Mammals	Fish	Aquatic Plants	Aquatic Invertebrates	Reference	Value	Reference
Birds									
Cave swallow (terrestrial)	0	100	0	0	0	0	Sample et al. 1997; Ehrlich et al. 1988	0	Sample et al. 1997
Cave swallow (aquatic)	0	0	0	0	0	100	Sample et al. 1997; Ehrlich et al. 1988	0	Sample et al. 1997
Common ground dove	95.0	0	0	0	0	0	Martin et al. 1951	5.0	Assumed based upon diet
Green heron	0	0	0	100	0	0	Exclusive diet	0	Sample et al. 1997
Pearly-eyed thrasher	0	95.4	0	0	0	0	Exclusive diet	4.6	Sample and Suter 1994 (value is for American robin)
Red-tailed hawk	0	0	100	0	0	0	USEPA 1993; Sample and Suter 1994	0	Sample and Suter 1994
Spotted sandpiper	0	0	0	0	0	82.0	USEPA 1993	18.0	Beyer et al. 1994
White-cheeked pintail	0	0	0	0	96.7	0	Exclusive diet	3.3	Beyer et al. 1994 (value is for mallard)
Mammals									
Fishing bat	0	0	0	100	0	0	Brooke 1994 (aquatic dietary component)	0	Assumed based upon diet
Indian Mongoose	0	97.2	0	0	0	0	Exclusive diet	2.8	Beyer et al. 1994 (value is for red fox)
Norway rat	98.0	0	0	0	0	0	Exclusive diet	2.0	Beyer et al. 1994 (value is for deer mouse)
Velvet free-tailed bat (terrestrial)	0	100	0	0	0	0	Reid 2009	0	Assumed based upon diet
Velvet free-tailed bat (aquatic)	0	0	0	0	0	100	Reid 2009	0	Assumed based upon diet

TABLE D-13
Exposure Parameters for Upper Trophic Level Ecological Receptors - Baseline
Laguna La Chiva, Vieques, Puerto Rico

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)		Home Range (ha)	
	Value	Reference	Value	Reference	Value	Reference	Value	Reference
Birds								
Cave swallow (terrestrial)	0.0158	Dunning 2008 (mean for male/female - Puerto Rico)	0.0037	allometric equation (USEPA 1993)[1]	0.0038	allometric equation (Nagy 2001)[5]	No data	--
Cave swallow (aquatic)	0.0158	Dunning 2008 (mean for male/female - Puerto Rico)	0.0037	allometric equation (USEPA 1993)[1]	0.0038	allometric equation (Nagy 2001)[5]	No data	--
Common ground dove	0.0320	Dunning 2008 (mean - Puerto Rico [gender not reported])	0.0059	allometric equation (USEPA 1993)[1]	0.0069	allometric equation (Nagy 2001)[4]	No data	--
Green heron	0.187	Dunning 2008 (mean for male/female - Caibbean)	0.0192	allometric equation (USEPA 1993)[1]	0.0230	allometric equation (Nagy 2001)[4]	No data	--
Pearly-eyed thrasher	0.104	Dunning 2008 (mean for male/female - Puerto Rico)	0.0129	allometric equation (USEPA 1993)[1]	0.0123	allometric equation (Nagy 2001)[3]	No data	--
Red-tailed hawk	1.134	USEPA 1993 (mean of 6 adult values [3 male/3 female])	0.0642	allometric equation (USEPA 1993)[1]	0.0363	Sample and Suter 1994	859	USEPA 1993 (mean for male/female adults)
Spotted sandpiper	0.0404	Dunning 2008 (mean - Pennsylvania [gender not reported])	0.0069	allometric equation (USEPA 1993)[1]	0.0080	allometric equation (Nagy 2001)[4]	0.25	USEPA 1993 (approximate)
White-cheeked pintail	0.519	Dunning 2008 (mean for male/female - Suriname)	0.0380	allometric equation (USEPA 1993)[1]	0.0462	allometric equation (Nagy 2001)[4]	No data	--
Mammals								
Fishing bat	0.0544	Silva and Downing 1995 (midpoint for male/female - Trinidad/Tobago)	0.0072	allometric equation (USEPA 1993)[2]	0.0053	allometric equation (Nagy 2001)[8]	No data	--
Indian mongoose	0.528	Silva and Downing 1995 (mean for male/female - Puerto Rico)	0.0557	allometric equation (USEPA 1993)[2]	0.0285	allometric equation (Nagy 2001)[7]	3.20	Nellis 1989
Norway rat	0.209	Silva and Downing 1995 (mean for male/female - Arkansas)	0.0242	allometric equation (USEPA 1993)[2]	0.0207	allometric equation (Nagy 2001)[6]	0.24	Stroud 1982
Velvet free-tailed bat (terrestrial)	0.0101	Silva and Downing 1995 (mean for male/female - Virgin Islands)	0.0016	allometric equation (USEPA 1993)[2]	0.0017	allometric equation (Nagy 2001)[8]	No data	--
Velvet free-tailed bat (aquatic)	0.0101	Silva and Downing 1995 (mean for male/female - Virgin Islands)	0.0016	allometric equation (USEPA 1993)[2]	0.0017	allometric equation (Nagy 2001)[8]	No data	--

1 - All birds equation: $0.059\ (BW)^{0.67}$
2 - All mammals equation: $0.099\ (BW)^{0.90}$
3 - Omnivorous birds equation: $(0.67*((BW*1000)^{0.627}))/1000$
4 - All birds equation: $(0.638*((BW*1000)^{0.685}))/1000$
5 - Insectivorous birds equation: $(0.54*((BW*1000)^{0.705}))/1000$
6 - Rodent equation used: $(0.332*((BW*1000)^{0.774}))/1000$
7 - Carnivore equation used: $(0.153*((BW*1000)^{0.834}))/1000$
8 - Bat equation used: (0.365*((BW*1000)0.671))/1000
Note: an area use factor of 1 was assumed for the baseline risk assessment

TABLE D-13
Exposure Parameters for Upper Trophic Level Ecological Receptors - Baseline
Laguna La Chiva, Vieques, Puerto Rico

Receptor	Dietary Composition (percent)							Soil/ Sediment Ingestion (percent)	
	Terrestrial Plants	Soil Invertebrates	Small Mammals	Fish	Aquatic Plants	Aquatic Invertebrates	Reference	Value	Reference
Birds									
Cave swallow (terrestrial)	0	100	0	0	0	0	Sample et al. 1997; Ehrlich et al. 1988	0	Sample et al. 1997
Cave swallow (aquatic)	0	0	0	0	0	100	Sample et al. 1997; Ehrlich et al. 1988	0	Sample et al. 1997
Common ground dove	95.0	0	0	0	0	0	Martin et al. 1951	5.0	Assumed based upon diet
Green heron	0	0	0	71.0	0	29.0	Sample et al. 1997	0	Sample et al. 1997
Pearly-eyed thrasher	20.0	75.4	0	0	0	0	Oberle 2000 (estimated based on description of diet)	4.6	Sample and Suter 1994 (value is for American robin)
Red-tailed hawk	0	0	100	0	0	0	USEPA 1993; Sample and Suter 1994	0	Sample and Suter 1994
Spotted sandpiper	0	0	0	0	0	82.0	USEPA 1993	18.0	Beyer et al. 1994
White-cheeked pintail	0	0	0	0	90.3	6.4	Martin et al. 1951 (average for winter, fall, summer)	3.3	Beyer et al. 1994 (value is for mallard)
Mammals									
Fishing bat	0	0	0	100	0	0	Brooke 1994 (aquatic dietary component)	0	Assumed based upon diet
Indian mongoose	11.1	56.4	29.7	0	0	0	Nellis 1989	2.8	Beyer et al. 1994 (value is for red fox)
Norway rat	49.0	49.0	0	0	0	0	Linzey 1998 (estimated based on description of diet)	2.0	Beyer et al. 1994 (value is for deer mouse)
Velvet free-tailed bat (terrestrial)	0	100	0	0	0	0	Reid 2009	0	Assumed based upon diet
Velvet free-tailed bat (aquatic)	0	0	0	0	0	100	Reid 2009	0	Assumed based upon diet

TABLE D-14
Soil Ecological Screening Values (ESVs) for Plants and Soil Invertebrates
Laguna La Chiva, Vieques, Puerto Rico

Chemical	ESV	Units	Type/Receptor	Reference	Comments
Pesticides					
4,4'-DDD	583	ug/kg		MHSPE 2000; 2001	Geometric mean of target and SRC values
4,4'-DDE	114	ug/kg		MHSPE 2000; 2001	Geometric mean of target and SRC values
4,4'-DDT	100	ug/kg		MHSPE 2000; 2001	Geometric mean of target and SRC values

TABLE D-15
Marine Sediment Ecological Screening Values (ESVs)
Laguna La Chiva, Vieques, Puerto Rico

Chemical	ESV	Units	Type[1]	Reference	Comments
Chemical	ESV	Units	Type[1]	Reference	Comments
Pesticides					
4,4'-DDD	1.22	ug/kg	TEL	MacDonald 1994	
4,4'-DDE	2.20	ug/kg	ER-L	Long et al. 1995	
4,4'-DDT	1.19	ug/kg	TEL	MacDonald 1994	
Semivolatile Organic Compounds					
1,1-Biphenyl	17.0	ug/kg	T20	Buchman 2008	
1,2,4,5-Tetrachlorobenzene	--	--	--	--	
2,2'-Oxybis(1-chloropropane)	--	--	--	--	
2,3,4,6-Tetrachlorophenol	--	--	--	--	
2,4,5-Trichlorophenol	3.00	ug/kg	AET	Buchman 2008	Infaunal community
2,4,6-Trichlorophenol	6.00	ug/kg	AET	Buchman 2008	Infaunal community
2,4-Dichlorophenol	--	--	--	--	
2,4-Dimethylphenol	29.0	ug/kg		Washington State 1995	Sediment Management (Quality) Standards
2,4-Dinitrophenol	--	--	--	--	
2,4-Dinitrotoluene	--	--	--	--	
2,6-Dinitrotoluene	549	ug/kg	NOEC	Nipper et al. 2002	
2-Chlorophenol	--	--	--	--	
2-Methylphenol	63.0	ug/kg		Washington State 1995	Sediment Management (Quality) Standards
2-Nitroaniline	--	--	--	--	
2-Nitrophenol	--	--	--	--	
3- and 4-Methylphenol	670	ug/kg		Washington State 1995	Sediment Management (Quality) Standards
3,3'-Dichlorobenzidine	--	--	--	--	
3-Nitroaniline	--	--	--	--	
4,6-Dinitro-2-methylphenol	--	--	--	--	
4-Bromophenyl-phenylether	--	--	--	--	
4-Chloro-3-methylphenol	--	--	--	--	
4-Chloroaniline	--	--	--	--	
4-Chlorophenyl-phenylether	--	--	--	--	
4-Nitroaniline	--	--	--	--	
4-Nitrophenol	--	--	--	--	
Acetophenone	--	--	--	--	
Atrazine	--	--	--	--	
Benzaldehyde	--	--	--	--	
bis(2-Chloroethoxy)methane	--	--	--	--	
bis(2-Chloroethyl)ether	--	--	--	--	
bis(2-Ethylhexyl)phthalate	182	ug/kg	TEL	MacDonald 1994	
Butylbenzylphthalate	63.0	ug/kg	AET	Buchman 2008	Microtox
Caprolactam	--	--	--	--	
Carbazole	--	--	--	--	
Dibenzofuran	110	ug/kg	AET	Buchman 2008	Echinoderm larvae
Diethylphthalate	6.00	ug/kg	AET	Buchman 2008	Bivalve/larval bioassay
Dimethyl phthalate	6.00	ug/kg	AET	Buchman 2008	Bivalve
Di-n-butylphthalate	58.0	ug/kg	AET	Buchman 2008	Bivalve/larval bioassay
Di-n-octylphthalate	61.0	ug/kg	AET	Buchman 2008	Bivalve/larval bioassay
Hexachlorobenzene	6.00	ug/kg	AET	Buchman 2008	Bivalve
Hexachlorobutadiene	1.30	ug/kg	AET	Buchman 2008	Echinoderm larvae
Hexachlorocyclopentadiene	--	--	--	--	
Hexachloroethane	73.0	ug/kg	AET	Buchman 2008	Bivalve/larval bioassay
Isophorone	--	--	--	--	
Nitrobenzene	21.0	ug/kg	AET	Buchman 2008	Neanthes
n-Nitroso-di-n-propylamine	--	--	--	--	
n-Nitrosodiphenylamine	28.0	ug/kg	AET	Buchman 2008	Infaunal community
Pentachlorophenol	360	ug/kg		Washington State 1995	Sediment Management (Quality) Standards
Phenol	420	ug/kg		Washington State 1995	Sediment Management (Quality) Standards
Volatile Organic Compounds					
1,1,1-Trichloroethane	--	--	--	--	
1,1,2,2-Tetrachloroethane	--	--	--	--	
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	--	--	--	--	

TABLE D-15
Marine Sediment Ecological Screening Values (ESVs)
Laguna La Chiva, Vieques, Puerto Rico

Chemical	ESV	Units	Type[1]	Reference	Comments
1,1,2-Trichloroethane	--	--	--	--	
1,1-Dichloroethane	--	--	--	--	
1,1-Dichloroethene	--	--	--	--	
1,2,3-Trichlorobenzene	--	--	--	--	
1,2,4-Trichlorobenzene	4.80	ug/kg	AET	Buchman 2008	Echinoderm larvae
1,2-Dibromo-3-chloropropane	--	--	--	--	
1,2-Dibromoethane	--	--	--	--	
1,2-Dichlorobenzene	13.0	ug/kg	AET	Buchman 2008	Neanthes
1,2-Dichloroethane	--	--	--	--	
1,2-Dichloropropane	--	--	--	--	
1,3-Dichlorobenzene	--	--	--	--	
1,4-Dichlorobenzene	110	ug/kg	AET	Buchman 2008	Infaunal community/Microtox
2-Butanone	--	--	--	--	
2-Hexanone	--	--	--	--	
4-Methyl-2-pentanone	--	--	--	--	
Acetone	--	--	--	--	
Benzene	--	--	--	--	
Bromochloromethane	--	--	--	--	
Bromodichloromethane	--	--	--	--	
Bromoform	--	--	--	--	
Bromomethane	--	--	--	--	
Carbon disulfide	--	--	--	--	
Carbon tetrachloride	--	--	--	--	
Chlorobenzene	--	--	--	--	
Chloroethane	--	--	--	--	
Chloroform	--	--	--	--	
Chloromethane	--	--	--	--	
cis-1,2-Dichloroethene	--	--	--	--	
cis-1,3-Dichloropropene	--	--	--	--	
Cyclohexane	--	--	--	--	
Dibromochloromethane	--	--	--	--	
Dichlorodifluoromethane(Freon-12)	--	--	--	--	
Ethylbenzene	4.00	ug/kg	AET	Buchman 2008	Echinoderm larvae/bioassay
Isopropylbenzene (Cumene)	--	--	--	--	
Methyl acetate	--	--	--	--	
Methylcyclohexane	--	--	--	--	
Methylene chloride	--	--	--	--	
Methyl-tert-butyl ether (MTBE)	--	--	--	--	
m- and p-Xylene	--	--	--	--	
o-Xylene	--	--	--	--	
Styrene	--	--	--	--	
Tetrachloroethene	57.0	ug/kg	AET	Buchman 2008	Infaunal community
Toluene	--	--	--	--	
trans-1,2-Dichloroethene	--	--	--	--	
trans-1,3-Dichloropropene	--	--	--	--	
Trichloroethene	41.0	ug/kg	AET	Buchman 2008	Neanthes
Trichlorofluoromethane(Freon-11)	--	--	--	--	
Vinyl chloride	--	--	--	--	

1 - AET: Apparent Effect Threshold; ER-L: Effects Range-Low; NOEC: No Observed Effect Concenttration; T20: Toxicity (20%); TEL: Threshold Effect Level

Table D-16
Marine Sediment Values Based on Equilibrium Partitioning (EqP)
Laguna La Chiva Site Investigation Report

Chemical	EqP Value	Units	TOC (%)	Reference	Comments
Semivolatile Organic Compounds					
1,2,4,5-Tetrachlorobenzene	46,988	ug/kg	1	USEPA 2006b	USEPA Region 3 value
1,2,4-Trichlorobenzene	473	ug/kg	1	USEPA 2006b	USEPA Region 3 value
1,2-Dichlorobenzene	989	ug/kg	1	USEPA 2006b	USEPA Region 3 value
1,3-Dichlorobenzene	842	ug/kg	1	USEPA 2006b	USEPA Region 3 value
1,4-Dichlorobenzene	458	ug/kg	1	USEPA 2006b	USEPA Region 3 value
2,4,5-Trichlorophenol	819	ug/kg	1	USEPA 2006b	USEPA Region 3 value
2,4,6-Trichlorophenol	2,650	ug/kg	1	USEPA 2006b	USEPA Region 3 value
2,4-Dinitrotoluene	3,184	ug/kg	1	NAVFAC 2007	Table 3-5
2,6-Dinitrotoluene	5,802	ug/kg	1	NAVFAC 2007	Table 3-5
2-Chlorophenol	344	ug/kg	1	USEPA 2006b	USEPA Region 3 value
2-Methylnaphthalene	380	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
3,3'-Dichlorobenzidine	2,060	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Acenaphthene	1,100	ug/kg	1	USEPA 1996a	
Acenaphthylene	660	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Anthracene	2,200	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Benzo(a)anthracene	1,100	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Benzo(a)pyrene	990	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Benzo(b)fluoranthene	2,300	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Benzo(g,h,i)perylene	310	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Benzo(k)fluoranthene	2,300	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
bis(2-Ethylhexyl)phthalate	470	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Butylbenzylphthalate	16,840	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Chrysene	1,100	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Dibenz(a,h)anthracene	120	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Dibenzofuran	7,300	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Diethylphthalate	218	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Dimethylphthalate	530	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Di-n-butylphthalate	1,160	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Di-n-octylphthalate	580	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Fluoranthene	1,400	ug/kg	1	USEPA 1996a	
Fluorene	230	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Hexachlorobenzene	3.80	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Hexachlorobutadiene	39.0	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Hexachlorocyclopentadiene	139	ug/kg	1	USEPA 2006b	USEPA Region 3 value

Table D-16
Marine Sediment Values Based on Equilibrium Partitioning (EqP)
Laguna La Chiva Site Investigation Report

Chemical	EqP Value	Units	TOC (%)	Reference	Comments
Hexachloroethane	804	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Indeno(1,2,3-cd)pyrene	340	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Naphthalene	990	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
N-Nitrosodiphenylamine	421,770	ug/kg	1	USEPA 2006b	USEPA Region 3 value
PAH (total)	2,900	ug/kg	1	USEPA 2006b	Threshold Effect Concentration
PAH (HMW)	9,600	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
PAH (LMW)	3,700	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Pentachlorophenol	7,970	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Phenanthrene	1,100	ug/kg	1	USEPA 1996a	
Pyrene	10,000	ug/kg	1	Washington State 1995	Sediment Management (Quality) Standards
Volatile Organic Compounds					
1,1,1-Trichloroethane	856	ug/kg	1	USEPA 2006b	USEPA Region 3 value
1,1,2,2-Tetrachloroethane	202	ug/kg	1	USEPA 2006b	USEPA Region 3 value
1,1,2-Trichloroethane	570	ug/kg	1	USEPA 2006b	USEPA Region 3 value
1,1-Dichloroethene	2,780	ug/kg	1	USEPA 2006b	USEPA Region 3 value
1,2,4-Trichlorobenzene	473	ug/kg	1	USEPA 2006b	USEPA Region 3 value
1,2-Dichlorobenzene	989	ug/kg	1	USEPA 2006b	USEPA Region 3 value
1,3-Dichlorobenzene	842	ug/kg	1	USEPA 2006b	USEPA Region 3 value
1,4-Dichlorobenzene	458	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Benzene	137	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Bromoform	1,310	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Carbon tetrachloride	7,245	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Chlorobenzene	162	ug/kg	1	USEPA 2006b	USEPA Region 3 value
cis-1,3-Dichloropropene	7.31	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Ethylbenzene	305	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Styrene	7,070	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Tetrachloroethene	190	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Toluene	1,085	ug/kg	1	USEPA 2006b	USEPA Region 3 value
trans-1,3-Dichloropropene	7.31	ug/kg	1	USEPA 2006b	USEPA Region 3 value
Trichloroethene	8,955	ug/kg	1	USEPA 2006b	USEPA Region 3 value

TABLE D-17
Uncertainty Factors
Laguna La Chiva, Vieques, Puerto Rico

Convert From	Convert To	Uncertainty Factor
Chronic NOAEL or NOEC	Chronic NOAEL or NOEC	1
Chronic LOAEL or LOEC	Chronic NOAEL or NOEC	5
Chronic NOAEL or NOEC	Chronic LOAEL or LOEC	5
Subchronic NOAEL or NOEC	Chronic NOAEL or NOEC	10
Subchronic LOAEL or LOEC	Chronic NOAEL or NOEC	20
Acute NOAEL or NOEC	Chronic NOAEL or NOEC	30
Acute LOAEL or LOEC	Chronic NOAEL or NOEC	50
LD50 or LC50	Chronic NOAEL or NOEC	100

Uncertainty factors from Wentsel et al. (1996)
Durations are defined as follows (USEPA 1999; Sample et al. 1996):
- Acute: <3 days (plants, invertebrates) and <14 days (fish, birds, mammals)
- Subchronic: 3 - 6 days (plants, invertebrates) and 14 - 90 days (fish, birds, mammals)
- Chronic: >7 days (plants, invertebrates) and >90 days or during critical life stage (fish, birds, mammals)

TABLE D-18
Eco-SSL Values for Birds and Mammals
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Bird	Mammal	Units	Reference
Organics				
4,4'-DDT (and metabolites)	93	21	ug/kg	USEPA 2007a

TABLE D-19
Ingestion-Based Toxicity Reference Values (TRVs) for Mammals
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Chemical Form	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	Reference	NOAEL (mg/kg/d)	Reference	MATC (mg/kg/d)
Pesticides											
4,4'-DDD	--	rat	--	15 days	oral (gavage)	survival, growth, reproduction	0.735	USEPA 2007a	0.147	USEPA 2007a	0.329
4,4'-DDE	--	rat	--	15 days	oral (gavage)	survival, growth, reproduction	0.735	USEPA 2007a	0.147	USEPA 2007a	0.329
4,4'-DDT	--	rat	--	15 days	oral (gavage)	survival, growth, reproduction	0.735	USEPA 2007a	0.147	USEPA 2007a	0.329
Volatile and Semivolatile Organic Compounds											
1,1,2,2-Tetrachloroethane	--	rat	0.35	78 weeks	oral (gavage)	reproduction	380 a	--	76.0	ATSDR 2008	170
1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	NA	--	NA	--	NA
1,2,4-Trichlorobenzene	--	rat	0.35	3 generations	oral in water	reproduction	106	Coulston and Kolbye 1994	53.0	Coulston and Kolbye 1994	75.0
1,2-Dichlorobenzene	--	rat	0.35	chronic	oral	liver/kidney	429 a	--	85.7	Coulston and Kolbye 1994	192
1,3-Dichlorobenzene	--	rat	0.35	chronic	oral	liver/kidney	429 a	--	85.7	Value for 1,2-Dichlorobenzene	192
1,4-Dichlorobenzene	--	rat	0.35	2 generations	oral (gavage)	developmental	90.0	ATSDR 2006	30.0	ATSDR 2006	52.0
4-Bromophenyl-phenylether	--	--	--	--	--	--	NA	--	NA	--	NA
4-Chlorophenyl-phenylether	--	--	--	--	--	--	NA	--	NA	--	NA
Hexachlorobenzene	--	rat	0.35	4 generations	oral in diet	reproduction	4.00	ATSDR 2002	2.00	ATSDR 2002	2.83
Hexachlorobutadiene	--	rat	0.35	GD 1-22; LD 1-21	oral in diet	developmental	20.0	ATSDR 1994	2.00	ATSDR 1994	6.32
Hexachlorocyclopentadiene	--	mouse	0.03	GD 6-15	oral (gavage)	developmental	375 a	--	75.0	ATSDR 1999	168
Hexachloroethane	--	rat	0.35	GD 6-16	oral (gavage)	reproduction	500	ATSDR 1997	100	ATSDR 1997	224
Pentachlorophenol	--	multiple	--	--	oral	survival, growth, reproduction	42.1 a	--	8.42	USEPA 2007c	18.8

NA - Not Available
[a] Uncertainty factor of 5 applied to NOAEL

TABLE D-20
Ingestion-Based Toxicity Reference Values (TRVs) for Birds
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Chemical Form	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	Applicable Target Wildlife Receptor							LOAEL (mg/kg/d)	Reference	NOAEL (mg/kg/d)	Reference	MATC (mg/kg/d)
Pesticides							Green Heron	White-Cheeked Pintail	Spotted Sandpiper	Pearly-eyed Thrasher	Common Ground Dove	Cave Swallow	Red-tailed Hawk					
4,4'-DDD	--	Japanese quail	0.11	3 generations	oral in diet	reproduction				x	x	x		5.00	DDT value	0.50	DDT value	1.58
4,4'-DDD	--	barn owl	0.47	2 years	oral in diet	reproduction							x	0.40 a	DDE value	0.08	DDE value	0.18
4,4'-DDD	--	mallard	1.00	2 years	oral in diet	reproduction		x	x					0.60	DDE value	0.12	DDE value	0.27
4,4'-DDD	--	bald eagle	--	112 days	oral in diet	survival	x							3.00	DDT value	0.30	DDT value	0.95
4,4'-DDE	--	Japanese quail	0.11	3 generations	oral in diet	reproduction				x	x	x		5.00	DDT value	0.50	DDT value	1.58
4,4'-DDE	--	barn owl	0.47	2 years	oral in diet	reproduction							x	0.40 a	--	0.08	Blus 1996	0.18
4,4'-DDE	--	mallard	1.00	2 years	oral in diet	reproduction		x	x					0.60	USEPA 1995b	0.12	USEPA 1995b	0.27
4,4'-DDE	--	bald eagle	--	112 days	oral in diet	survival	x							3.00	DDT value	0.30	DDT value	0.95
4,4'-DDT	--	Japanese quail	0.11	3 generations	oral in diet	reproduction				x	x	x		5.00	USEPA 1995b	0.50	USEPA 1995b	1.58
4,4'-DDT	--	barn owl	0.47	2 years	oral in diet	reproduction							x	0.40 a	DDE value	0.08	DDE value	0.18
4,4'-DDT	--	mallard	1.00	2 years	oral in diet	reproduction		x	x					1.50	USEPA 1995b	0.60	USEPA 1995b	0.95
4,4'-DDT	--	bald eagle	--	112 days	oral in diet	survival	x							3.00	USEPA 1995b	0.30	USEPA 1995b	0.95
Volatile and Semivolatile Organic Compounds																		
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	NA	--	NA
1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	NA	--	NA
1,2,4-Trichlorobenzene	--	northern bobwhite	0.19	14 days	oral	survival	x	x	x	x	x	x	x	161 a	1,4-Dichlorobenzene value	32.2 b	1,4-Dichlorobenzene value	71.9
1,2-Dichlorobenzene	--	northern bobwhite	0.19	14 days	oral	survival	x	x	x	x	x	x	x	161 a	1,4-Dichlorobenzene value	32.2 b	1,4-Dichlorobenzene value	71.9
1,3-Dichlorobenzene	--	northern bobwhite	0.19	14 days	oral	survival	x	x	x	x	x	x	x	161 a	1,4-Dichlorobenzene value	32.2 b	1,4-Dichlorobenzene value	71.9
1,4-Dichlorobenzene	--	northern bobwhite	0.19	14 days	oral	survival	x	x	x	x	x	x	x	161 a	--	32.2 b	TERRETOX 2002	71.9
4-Bromophenyl-phenylether	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	NA	--	NA
4-Chlorophenyl-phenylether	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	NA	--	NA
Hexachlorobenzene	--	Japanese quail	0.15	90 days	oral in diet	reproduction	x	x	x	x	x	x	x	0.57	Coulston and Kolbye 1994; TERRETOX 2002	0.113	Coulston and Kolbye 1994; TERRETOX 2002	0.253
Hexachlorobutadiene	--	Japanese quail	0.15	90 days	oral in diet	reproduction	x	x	x	x	x	x	x	17.0 a	--	3.39	Coulston and Kolbye 1994; TERRETOX 2002	7.58
Hexachlorocyclopentadiene	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	NA	--	NA
Hexachloroethane	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	NA	--	NA
Pentachlorophenol	--	chicken	--	1 week	oral in diet	survival, growth	x	x	x	x	x	x	x	67.3	USEPA 2007c	6.73	USEPA 2007c	21.3

NA - Not Available
[a] Uncertainty factor of 5 applied to NOAEL
[b] Acute to chronic uncertainty factor of 50 applied

TABLE D-21
Background Data and Upper Tolerance Limits (UTLs) - Surface Soil
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Combined Set		
	Maximum	Mean	UTL
Pesticides (ug/kg)[1]			
4,4'-DDD	26.0	--	--
4,4'-DDE	1,200	--	--
4,4'-DDT	990	--	--

NR - Not Reported

1 - Maximum detected concentrations at East Vieques sites considered representative of normal pesticide application and not CERCLA releases (CH2M HILL, 2009a)

TABLE D-22
Screening Statistics for Plants and Soil Invertebrates - Laguna La Chiva Surface Soil
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	Background UTL	Frequency of UTL Exceedance	Maximum Ratio	95% UCL Hazard Quotient	Mean Hazard Quotient	Step 3A COPC?
Pesticide/Polychlorinated Biphenyls (UG/KG)																			
4,4'-DDD	1.30 - 110	0 / 7	--	--	--	8.55	20.5	23.6	1.45	583	-- / --	0.19	NO	--	-- / --	--	--	--	NO
4,4'-DDE	1.30 - 2.10	1 / 7	2,300	2,300	VENO-SS05-0002	329	869	968	2.48	114	1 / 7	20.2	YES	1,200	1 / 7	1.92	8.49	2.89	YES
4,4'-DDT	1.30 - 110	0 / 7	--	--	--	8.55	20.5	23.6	1.45	100	-- / --	1.10	YES	990	0 / 0	0.11	--	--	NO
Other Parameters (various units)														--	-- / --	--	--		
pH (PH)	-- - --	7 / 7	7.50	8.20	VENO-SS04-0001	7.81	0.25	8.00	7.81	--	-- / --	--	--	--	-- / --	--	--	--	--
Total organic carbon (TOC) (MG/KG)	-- - --	7 / 7	8,900	24,000	VENO-SS07-0002	15,557	5,760	19,787	14,658	--	-- / --	--	--	--	-- / --	--	--	--	--

1 - Count of detected samples exceeding or equaling Screening Value
2 - Shaded cells indicate hazard quotient based on reporting limits
UG/KG - Micrograms per kilogram
PH - pH units
MG/KG - Milligrams per kilogram

TABLE D-23
Screening Statistics - Laguna La Chiva Surface Soil - Mammal/Bird Eco-SSLs
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Maximum Concentration Detected	95% UCL (Norm)	Arithmetic Mean	Mammal Eco-SSL	Frequency of Exceedance	Maximum Hazard Quotient	95% UCL Hazard Quotient	Mean Hazard Quotient	Bird Eco-SSL	Frequency of Exceedance	Maximum Hazard Quotient	95% UCL Hazard Quotient	Mean Hazard Quotient
Pesticides (UG/KG)															
4,4'-DDD	1.3 - 110	0 / 7	--	23.59	8.55	21	0 / 7	5.24	1.12	0.41	93	0 / 7	1.18	0.25	0.09
4,4'-DDE	1.3 - 2	1 / 7	2,300	967.51	329.26	21	1 / 7	110	46.1	15.7	93	1 / 7	24.7	10.4	3.54
4,4'-DDT	1.3 - 110	0 / 7	--	23.59	8.55	21	0 / 7	5.24	1.12	0.41	93	0 / 7	1.18	0.25	0.09

Shaded cells indicate HQ > 1

TABLE D-24
Hazard Quotients for Terrestrial Food Web Exposures - Step 2 (Screening) - Maximum
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Norway Rat			Indian Mongoose			Velvet Free-Tailed Bat			Pearly-eyed Thrasher			Red-tailed Hawk			Common Ground Dove			Cave Swallow		
	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides																					
4,4'-DDD	0.03	0.01	0.01	1.20	0.54	0.24	1.99	0.89	0.40	0.51	0.16	0.05	0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	0.75	0.24	0.08
4,4'-DDE	0.31	0.14	0.06	25.18	11.26	5.04	41.6	18.63	8.33	10.7	3.40	1.07	0.10	0.04	0.02	0.19	0.06	0.02	15.7	4.96	1.57
4,4'-DDT	0.03	0.01	0.01	1.20	0.54	0.24	1.99	0.89	0.40	0.51	0.16	0.05	0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	0.75	0.24	0.08

Shaded cells indicate HQ > 1

TABLE D-25
Hazard Quotients for Terrestrial Food Web Exposures - Step 3A (Baseline) - 95% UCL
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Norway Rat			Indian Mongoose			Velvet Free-Tailed Bat			Pearly-eyed Thrasher			Red-tailed Hawk			Common Ground Dove			Cave Swallow		
	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides																					
4,4'-DDD	0.08	0.04	0.02	0.06	0.03	0.01	0.27	0.12	0.05	0.04	0.01	0.00	0.05	0.02	0.01	0.00	0.00	0.00	0.11	0.04	0.01
4,4'-DDE	3.87	1.73	0.77	3.04	1.36	0.61	13.4	6.00	2.68	2.1	0.66	0.21	2.29	1.02	0.46	0.05	0.02	0.01	5.5	1.75	0.55
4,4'-DDT	0.11	0.05	0.02	0.08	0.04	0.02	0.37	0.17	0.07	0.06	0.02	0.01	0.06	0.03	0.01	0.00	0.00	0.00	0.15	0.05	0.02

Shaded cells indicate HQ > 1

TABLE D-26
Hazard Quotients for Terrestrial Food Web Exposures - Step 3A (Baseline) - Mean
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Norway Rat			Indian Mongoose			Velvet Free-Tailed Bat			Pearly-eyed Thrasher			Red-tailed Hawk			Common Ground Dove			Cave Swallow		
	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides																					
4,4'-DDD	0.04	0.02	0.01	0.03	0.01	0.01	0.13	0.06	0.03	0.02	0.01	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.06	0.02	0.01
4,4'-DDE	1.50	0.67	0.30	1.18	0.53	0.24	5.2	2.32	1.04	0.8	0.25	0.08	0.89	0.40	0.18	0.02	0.01	0.00	2.1	0.68	0.21
4,4'-DDT	0.05	0.02	0.01	0.04	0.02	0.01	0.16	0.07	0.03	0.02	0.01	0.00	0.03	0.01	0.01	0.00	0.00	0.00	0.06	0.02	0.01

Shaded cells indicate HQ > 1

TABLE D-27
Screening Statistics - Sediment - Laguna La Chiva
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	95% UCL Hazard Quotient	Mean Hazard Quotient	Step 3A COPC?
Volatile Organic Compounds (UG/KG)																
1,1,1-Trichloroethane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
1,1,2,2-Tetrachloroethane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
1,1,2-Trichloroethane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
1,1-Dichloroethane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
1,1-Dichloroethene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
1,2,3-Trichlorobenzene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
1,2,4-Trichlorobenzene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	4.80	-- / --	1.21	YES	0.38	0.31	NO
1,2-Dibromo-3-chloropropane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
1,2-Dibromoethane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
1,2-Dichlorobenzene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	13.0	-- / --	0.45	NO	0.14	0.11	NO
1,2-Dichloroethane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
1,2-Dichloropropane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
1,3-Dichlorobenzene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
1,4-Dichlorobenzene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	110	-- / --	0.053	NO	0.02	0.013	NO
2-Butanone	3.30 - 3.30	11 / 12	4.90	56.0	VENO-SD06-000H	22.4	16.0	30.7	16.2	NSV	-- / --	NSV	YES	NSV	NSV	YES
2-Hexanone	3.30 - 14.0	0 / 12	--	--	--	3.71	1.68	4.58	3.40	NSV	-- / --	NSV	NO	NSV	NSV	NO
4-Methyl-2-pentanone	3.30 - 14.0	0 / 12	--	--	--	3.71	1.68	4.58	3.40	NSV	-- / --	NSV	NO	NSV	NSV	NO
Acetone	-- - --	12 / 12	8.10	240	VENO-SD06-000H	98.4	61.4	130	74.7	NSV	-- / --	NSV	YES	NSV	NSV	YES
Benzene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Bromochloromethane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Bromodichloromethane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Bromoform	1.30 - 5.80	1 / 12	0.70	0.70	VENO-SD10-000H	1.46	0.70	1.82	1.32	NSV	-- / --	NSV	YES	NSV	NSV	YES
Bromomethane	6.60 - 29.0	0 / 12	--	--	--	7.47	3.38	9.22	6.85	NSV	-- / --	NSV	NO	NSV	NSV	NO
Carbon disulfide	9.10 - 13.0	9 / 12	4.80	51.0	VENO-SD04-000H	17.4	14.1	24.7	12.9	NSV	-- / --	NSV	YES	NSV	NSV	YES
Carbon tetrachloride	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Chlorobenzene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Chloroethane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Chloroform	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Chloromethane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
cis-1,2-Dichloroethene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
cis-1,3-Dichloropropene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Cyclohexane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Dibromochloromethane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Dichlorodifluoromethane (Freon-12)	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Ethylbenzene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	4.00	-- / --	1.45	YES	0.46	0.37	NO
Isopropylbenzene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
m- and p-Xylene	2.60 - 12.0	0 / 12	--	--	--	2.98	1.39	3.70	2.72	NSV	-- / --	NSV	NO	NSV	NSV	NO
Methyl acetate	6.60 - 29.0	0 / 12	--	--	--	7.47	3.38	9.22	6.85	NSV	-- / --	NSV	NO	NSV	NSV	NO
Methylcyclohexane	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Methylene chloride	6.60 - 29.0	0 / 12	--	--	--	7.47	3.38	9.22	6.85	NSV	-- / --	NSV	NO	NSV	NSV	NO
Methyl-tert-butyl ether (MTBE)	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
o-Xylene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Styrene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Tetrachloroethene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	57.0	-- / --	0.10	NO	--	--	NO
Toluene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
trans-1,2-Dichloroethene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
trans-1,3-Dichloropropene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Trichloroethene	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	41.0	-- / --	0.14	NO	--	--	NO
Trichlorofluoromethane (Freon-11)	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO

TABLE D-27
Screening Statistics - Sediment - Laguna La Chiva
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	95% UCL Hazard Quotient	Mean Hazard Quotient	Step 3A COPC?
Vinyl chloride	1.30 - 5.80	0 / 12	--	--	--	1.48	0.68	1.83	1.36	NSV	-- / --	NSV	NO	NSV	NSV	NO
Semivolatile Organic Compounds (UG/KG)																
1,1-Biphenyl	130 - 290	0 / 9	--	--	--	108	23.5	123	106	17.0	-- / --	17.1	YES	7.23	6.37	(YES)
1,2,4,5-Tetrachlorobenzene	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
2,2'-Oxybis(1-chloropropane)	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
2,3,4,6-Tetrachlorophenol	260 - 840	0 / 10	--	--	--	237	77.8	282	226	NSV	-- / --	NSV	NO	NSV	NSV	NO
2,4,5-Trichlorophenol	130 - 420	0 / 10	--	--	--	119	39.0	141	113	3.00	-- / --	140	YES	47.0	39.5	(YES)
2,4,6-Trichlorophenol	130 - 420	0 / 10	--	--	--	119	39.0	141	113	6.00	-- / --	70.0	YES	23.5	19.8	(YES)
2,4-Dichlorophenol	130 - 420	0 / 10	--	--	--	119	39.0	141	113	NSV	-- / --	NSV	NO	NSV	NSV	NO
2,4-Dimethylphenol	130 - 420	0 / 10	--	--	--	119	39.0	141	113	29.0	-- / --	14.5	YES	4.87	4.09	(YES)
2,4-Dinitrophenol	400 - 1,300	0 / 10	--	--	--	358	121	428	342	NSV	-- / --	NSV	NO	NSV	NSV	NO
2,4-Dinitrotoluene	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
2,6-Dinitrotoluene	130 - 290	0 / 9	--	--	--	108	23.5	123	106	549	-- / --	0.53	NO	--	--	NO
2-Chlorophenol	130 - 420	0 / 10	--	--	--	119	39.0	141	113	NSV	-- / --	NSV	NO	NSV	NSV	NO
2-Methylphenol	130 - 420	0 / 10	--	--	--	119	39.0	141	113	63.0	-- / --	6.67	YES	2.24	1.88	(YES)
2-Nitroaniline	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
2-Nitrophenol	130 - 420	0 / 10	--	--	--	119	39.0	141	113	NSV	-- / --	NSV	NO	NSV	NSV	NO
3- and 4-Methylphenol	260 - 840	0 / 10	--	--	--	237	77.8	282	226	670	-- / --	1.25	YES	0.42	0.35	NO
3,3'-Dichlorobenzidine	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
3-Nitroaniline	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
4,6-Dinitro-2-methylphenol	400 - 1,300	0 / 10	--	--	--	358	121	428	342	NSV	-- / --	NSV	NO	NSV	NSV	NO
4-Bromophenyl-phenylether	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
4-Chloro-3-methylphenol	130 - 420	0 / 10	--	--	--	119	39.0	141	113	NSV	-- / --	NSV	NO	NSV	NSV	NO
4-Chloroaniline	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
4-Chlorophenyl-phenylether	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
4-Nitroaniline	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
4-Nitrophenol	130 - 420	0 / 10	--	--	--	119	39.0	141	113	NSV	-- / --	NSV	NO	NSV	NSV	NO
Acetophenone	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
Atrazine	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
Benzaldehyde	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
bis(2-Chloroethoxy)methane	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
bis(2-Chloroethyl)ether	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
bis(2-Ethylhexyl)phthalate	130 - 290	0 / 9	--	--	--	108	23.5	123	106	182	-- / --	1.59	YES	0.68	0.60	NO
Butylbenzylphthalate	130 - 290	0 / 9	--	--	--	108	23.5	123	106	63.0	-- / --	4.60	YES	1.95	1.72	(YES)
Caprolactam	260 - 580	0 / 9	--	--	--	216	46.2	245	211	NSV	-- / --	NSV	NO	NSV	NSV	NO
Carbazole	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
Dibenzofuran	130 - 290	0 / 9	--	--	--	108	23.5	123	106	110	-- / --	2.64	YES	1.12	0.98	NO
Diethylphthalate	130 - 290	0 / 9	--	--	--	108	23.5	123	106	6.00	-- / --	48.3	YES	20.48	18.1	(YES)
Dimethyl phthalate	130 - 290	0 / 9	--	--	--	108	23.5	123	106	6.00	-- / --	48.3	YES	20.48	18.1	(YES)
Di-n-butylphthalate	130 - 290	0 / 9	--	--	--	108	23.5	123	106	58.0	-- / --	5.00	YES	2.12	1.87	(YES)
Di-n-octylphthalate	130 - 290	0 / 9	--	--	--	108	23.5	123	106	61.0	-- / --	4.75	YES	2.01	1.78	(YES)
Hexachlorobenzene	130 - 290	0 / 9	--	--	--	108	23.5	123	106	6.00	-- / --	48.3	YES	20.48	18.1	(YES)
Hexachlorobutadiene	130 - 290	0 / 9	--	--	--	108	23.5	123	106	1.30	-- / --	223	YES	94.52	83.3	(YES)
Hexachlorocyclopentadiene	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
Hexachloroethane	130 - 290	0 / 9	--	--	--	108	23.5	123	106	73.0	-- / --	3.97	YES	1.68	1.48	(YES)
Isophorone	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
n-Nitroso-di-n-propylamine	130 - 290	0 / 9	--	--	--	108	23.5	123	106	NSV	-- / --	NSV	NO	NSV	NSV	NO
n-Nitrosodiphenylamine	260 - 580	0 / 9	--	--	--	216	46.2	245	211	28.0	-- / --	20.7	YES	8.74	7.72	(YES)
Nitrobenzene	130 - 290	0 / 9	--	--	--	108	23.5	123	106	21.0	-- / --	13.8	YES	5.85	5.16	(YES)
Pentachlorophenol	400 - 1,300	0 / 10	--	--	--	358	121	428	342	360	-- / --	3.61	YES	1.19	0.99	NO
Phenol	130 - 420	0 / 10	--	--	--	119	39.0	141	113	420	-- / --	1.00	YES	0.34	0.28	NO

TABLE D-27
Screening Statistics - Sediment - Laguna La Chiva
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL (Norm)	Geometric Mean	Screening Value	Frequency of Exceedance[1]	Maximum Hazard Quotient[2]	Step 2 COPC?	95% UCL Hazard Quotient	Mean Hazard Quotient	Step 3A COPC?
Pesticide/Polychlorinated Biphenyls (UG/KG)																
4,4'-DDD	3.80 - 5.80	8 / 12	2.60	150	VENO-SD06-000H	23.3	44.9	46.6	7.30	1.22	8 / 12	123	YES	38.2	19.1	YES
4,4'-DDE	2.60 - 7.20	6 / 12	14.0	20.0	VENO-SD04-000H	9.37	7.45	13.2	6.09	2.20	6 / 12	9.09	YES	6.0	4.26	YES
4,4'-DDT	2.60 - 8.40	4 / 12	3.70	54.0	VENO-SD03-000H	7.65	14.7	15.3	3.87	1.19	4 / 12	45.4	YES	12.8	6.43	YES
Other Parameters (various units)																
pH (PH)	-- - --	12 / 12	7.30	8.10	VENO-SD09-000H	7.73	0.23	7.86	7.73	--	-- / --	--	--	--	--	--
Total organic carbon (TOC) (MG/KG)	-- - --	12 / 12	4,500	100,000	VENO-SD04-000H	45,625	23,478	57,797	38,046	--	-- / --	--	--	--	--	--

NSV - No Screening Value
1 - Count of detected samples exceeding or equaling Screening Value
2 - Shaded cells indicate hazard quotient based on reporting limits
MG/KG - Milligrams per kilogram
UG/KG - Micrograms per kilogram
pH - pH units

Table D-28

Comparison of Sediment Step 3A COPC Concentrations With Equilibrium Partitioning-Based Sediment Values - Laguna La Chiva

Laguna La Chiva Site Investigation Report

	Sediment Statistics				Calculation of EqP													
Chemical	Frequency of Detection	Maximum Concentration Detected	95% UCL (Norm)	Arithmetic Mean	Marine Water TRV	Units	Reference	log Kow	Reference	Koc[a]	Mean Total Organic Carbon (%)	Sediment EqP Value[b]	Units	Frequency of EqP Exceedance	Maximum Hazard Quotient	95% UCL Hazard Quotient	Mean Hazard Quotient	COPC for Risk Evaluation?
Volatile Organic Compounds (UG/KG)																		
2-Butanone	11 / 12	56.0	30.7	22.4	14,000	ug/L	Freshwater	0.28	USEPA 1995a	1.89	4.56	1,204	ug/kg	0 / 12	0.05	--	--	NO
Acetone	12 / 12	240	130	98.4	564,000	ug/L		-0.24	USEPA 1995a	0.58	4.56	14,949	ug/kg	0 / 12	0.02	--	--	NO
Bromoform	1 / 12	0.70	1.82	1.46	--	--	--	--	--	--	4.56	5,974	ug/kg	0 / 12	0.0001	--	--	NO
Carbon disulfide	9 / 12	51.0	24.7	17.4	0.92	ug/L	Freshwater	2.00	USEPA 1995a	92.5	4.56	3.88	ug/kg	9 / 12	13.14	6.37	4.49	YES
Pesticides (UG/KG)																		
4,4'-DDD	8 / 12	150	46.6	23.3	0.001	ug/L		6.10	USEPA 1995a	992,156	4.56	45.2	ug/kg	2 / 12	3.32	1.0	0.5	NO
4,4'-DDE	6 / 12	20.0	13.2	9.37	0.001	ug/L		6.76	USEPA 1995a	4,419,366	4.56	202	ug/kg	0 / 12	0.10	--	--	NO
4,4'-DDT	4 / 12	54.0	15.3	7.65	0.001	ug/L		6.53	USEPA 1995a	2,625,851	4.56	120	ug/kg	0 / 12	0.45	--	--	NO

UG/KG - Micrograms per kilogram

UG/L - Micrograms per liter

a Koc calculated according to equation and method described in USEPA (1996a)

b Sediment screening value calculated according to equation and method described in USEPA (1996a

TABLE D-29
Hazard Quotients for Aquatic Food Web Exposures - Step 2 (Screening) - Maximum
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Green Heron			Spotted Sandpiper			White-cheeked Pintail			Cave Swallow			Fishing Bat			Velvet Free-Tailed Bat		
	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides																		
4,4'-DDD	0.75	0.24	0.08	0.95	0.42	0.19	0.03	0.01	0.01	0.22	0.07	0.02	1.84	0.82	0.37	0.57	0.26	0.11
4,4'-DDE	1.13	0.36	0.11	0.13	0.06	0.03	0.01	< 0.01	< 0.01	0.03	0.01	< 0.01	2.75	1.23	0.55	0.08	0.03	0.02
4,4'-DDT	0.31	0.10	0.03	0.02	0.01	0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	0.75	0.34	0.15	0.04	0.02	0.01
Volatile/Semivolatile Organics																		
1,1,2,2-Tetrachloroethane **	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4,5-Tetrachlorobenzene **	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene **	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-Dichlorobenzene **	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-Dichlorobenzene **	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,4-Dichlorobenzene **	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
4-Bromophenyl-phenylether **	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether **	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene **	0.23	0.10	0.05	0.81	0.36	0.16	0.09	0.04	0.02	0.67	0.30	0.13	0.02	0.01	0.01	0.03	0.02	0.01
Hexachlorobutadiene **	< 0.01	< 0.01	< 0.01	0.02	0.01	< 0.01	0.01	< 0.01	< 0.01	0.02	0.01	< 0.01	0.01	< 0.01	< 0.01	0.02	0.01	< 0.01
Hexachlorocyclopentadiene **	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachloroethane **	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pentachlorophenol **	0.08	0.02	0.01	0.07	0.02	0.01	0.15	0.05	0.01	0.06	0.02	0.01	0.07	0.03	0.01	0.04	0.02	0.01

** - Concentrations based on detection limits; chemical not detected
NA - not available
Shaded cells indicate HQ > 1

TABLE D-30
Hazard Quotients for Aquatic Food Web Exposures - Step 3A (Baseline) - 95% UCL
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Green Heron			Spotted Sandpiper			White-cheeked Pintail			Cave Swallow			Fishing Bat			Velvet Free-Tailed Bat		
	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides																		
4,4'-DDD	0.07	0.02	0.01	0.16	0.07	0.03	0.01	0.01	0.00	0.05	0.02	0.01	0.12	0.05	0.02	0.13	0.06	0.03
4,4'-DDE	0.03	0.01	0.00	0.05	0.02	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.06	0.03	0.01	0.04	0.02	0.01

NA - not available
Shaded cells indicate HQ > 1

TABLE D-31
Hazard Quotients for Aquatic Food Web Exposures - Step 3A (Baseline) - Mean
Laguna La Chiva, Vieques, Puerto Rico

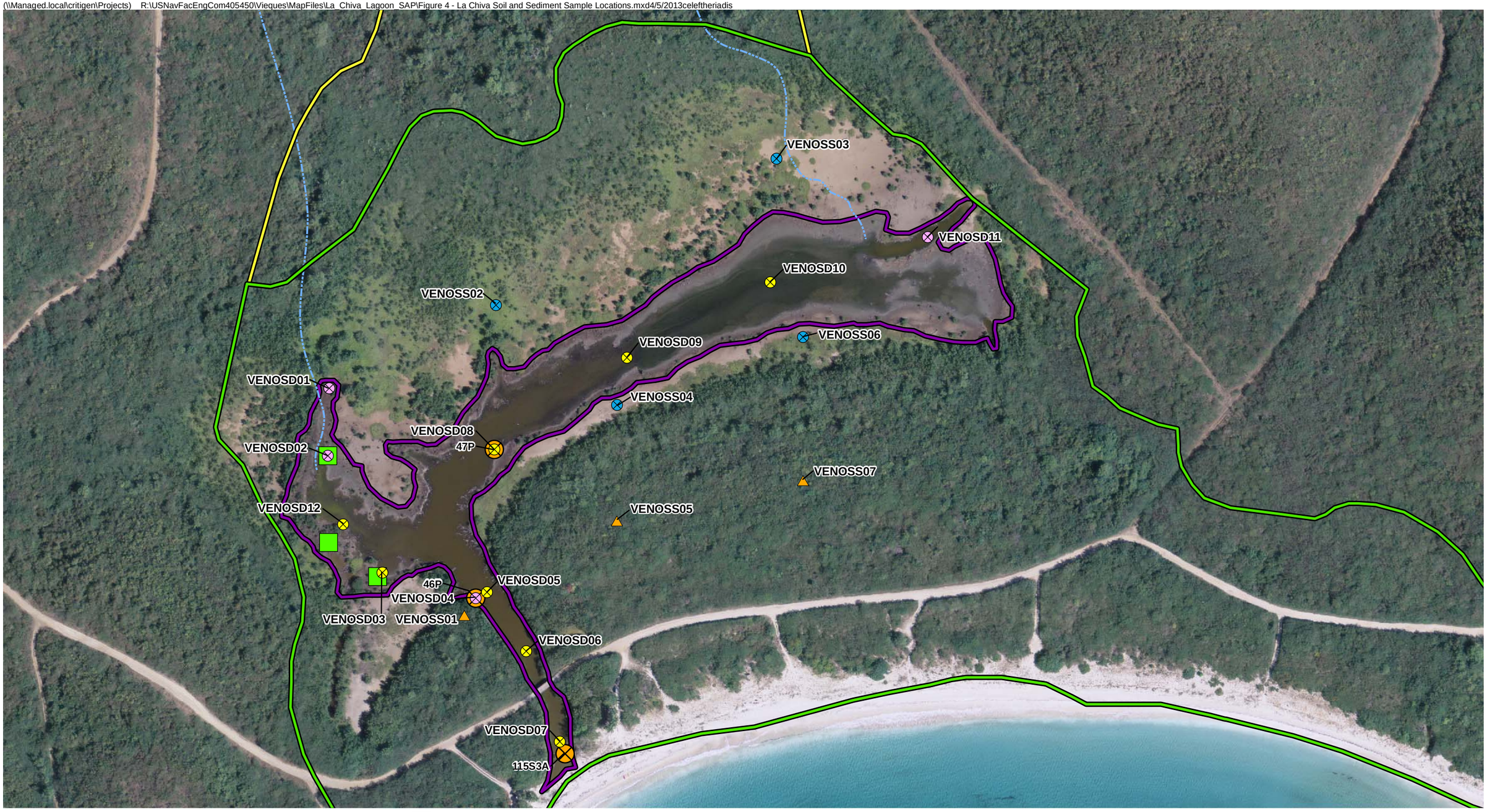
Chemical	Green Heron			Spotted Sandpiper			White-cheeked Pintail			Cave Swallow			Fishing Bat			Velvet Free-Tailed Bat		
	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides																		
4,4'-DDD	0.03	0.01	0.00	0.08	0.04	0.02	0.01	0.00	0.00	0.03	0.01	0.00	0.06	0.03	0.01	0.06	0.03	0.01
4,4'-DDE	0.02	0.01	0.00	0.03	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.04	0.02	0.01	0.03	0.01	0.01

NA - not available
Shaded cells indicate HQ > 1

TABLE D-32
Reporting Limit to Screening Value Comparison
Laguna La Chiva, Vieques, Puerto Rico

Chemical	Units	Frequency of Detection	Minimum Reporting Limit	Maximum Reporting Limit	Mean Concentration	Screening Value	Minimum Ratio	Maximum Ratio	Mean Ratio
Volatile Organic Compounds									
1,2,4-Trichlorobenzene	UG/KG	0 / 12	1.3	5.8	1.48	4.80	0.27	1.21	0.31
Ethylbenzene	UG/KG	0 / 12	1.3	5.8	1.48	4.00	0.33	1.45	0.37
Semivolatile Organic Compounds									
1,1-Biphenyl	UG/KG	0 / 9	130	290	108	17.0	7.65	17.06	6.37
2,4,5-Trichlorophenol	UG/KG	0 / 10	130	420	119	3.00	43.33	140.00	39.50
2,4,6-Trichlorophenol	UG/KG	0 / 10	130	420	119	6.00	21.67	70.00	19.75
2,4-Dimethylphenol	UG/KG	0 / 10	130	420	119	29.0	4.48	14.48	4.09
2-Methylphenol	UG/KG	0 / 10	130	420	119	63.0	2.06	6.67	1.88
3- and 4-Methylphenol	UG/KG	0 / 10	260	840	237	670	0.39	1.25	0.35
bis(2-Ethylhexyl)phthalate	UG/KG	0 / 9	130	290	108	182	0.71	1.59	0.60
Butylbenzylphthalate	UG/KG	0 / 9	130	290	108	63.0	2.06	4.60	1.72
Dibenzofuran	UG/KG	0 / 9	130	290	108	110	1.18	2.64	0.98
Diethylphthalate	UG/KG	0 / 9	130	290	108	6.00	21.67	48.33	18.06
Dimethyl phthalate	UG/KG	0 / 9	130	290	108	6.00	21.67	48.33	18.06
Di-n-butylphthalate	UG/KG	0 / 9	130	290	108	58.0	2.24	5.00	1.87
Di-n-octylphthalate	UG/KG	0 / 9	130	290	108	61.0	2.13	4.75	1.78
Hexachlorobenzene	UG/KG	0 / 9	130	290	108	6.00	21.67	48.33	18.06
Hexachlorobutadiene	UG/KG	0 / 9	130	290	108	1.30	100.00	223.08	83.33
Hexachloroethane	UG/KG	0 / 9	130	290	108	73.0	1.78	3.97	1.48
n-Nitrosodiphenylamine	UG/KG	0 / 9	260	580	216	28.0	9.29	20.71	7.72
Nitrobenzene	UG/KG	0 / 9	130	290	108	21.0	6.19	13.81	5.16
Pentachlorophenol	UG/KG	0 / 10	400	1300	358	360	1.11	3.61	0.99
Phenol	UG/KG	0 / 10	130	420	119	420	0.31	1.00	0.28

Figures



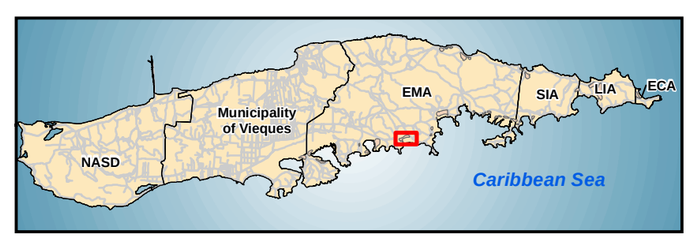
- Proposed Surface Soil Samples (0-1ft bgs)
- Proposed Sediment Sample Location (0-6-in bgs)
- Proposed Surface Sediment (0-6-in. bgs) and Subsurface Sediment (6-12-in. bgs)
- Proposed Surface Soil Sample in Land Crab Habitat (0-2ft bgs)
- NOAA Sediment Samples collected Oct. 2007*

* An Ecological Characterization of The Marine Resources of Vieques, Puerto Rico. Part II: Field Studies of Habitats, Nutrients, Contaminants, Fish and Benthic Communities. NOAA Technical Memorandum NOS NCCOS 110

- Drum Remnants
- Ephemeral Stream

Wetland Type

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Forested/Shrub Wetland



0 100 200 Feet

North

FIGURE D-1
Laguna La Chiva Soil and Sediment Sample Locations
Laguna La Chiva Site Inspection/
Remedial Investigation
Former Vieques Naval Training Range
Vieques, Puerto Rico

CH2MHILL

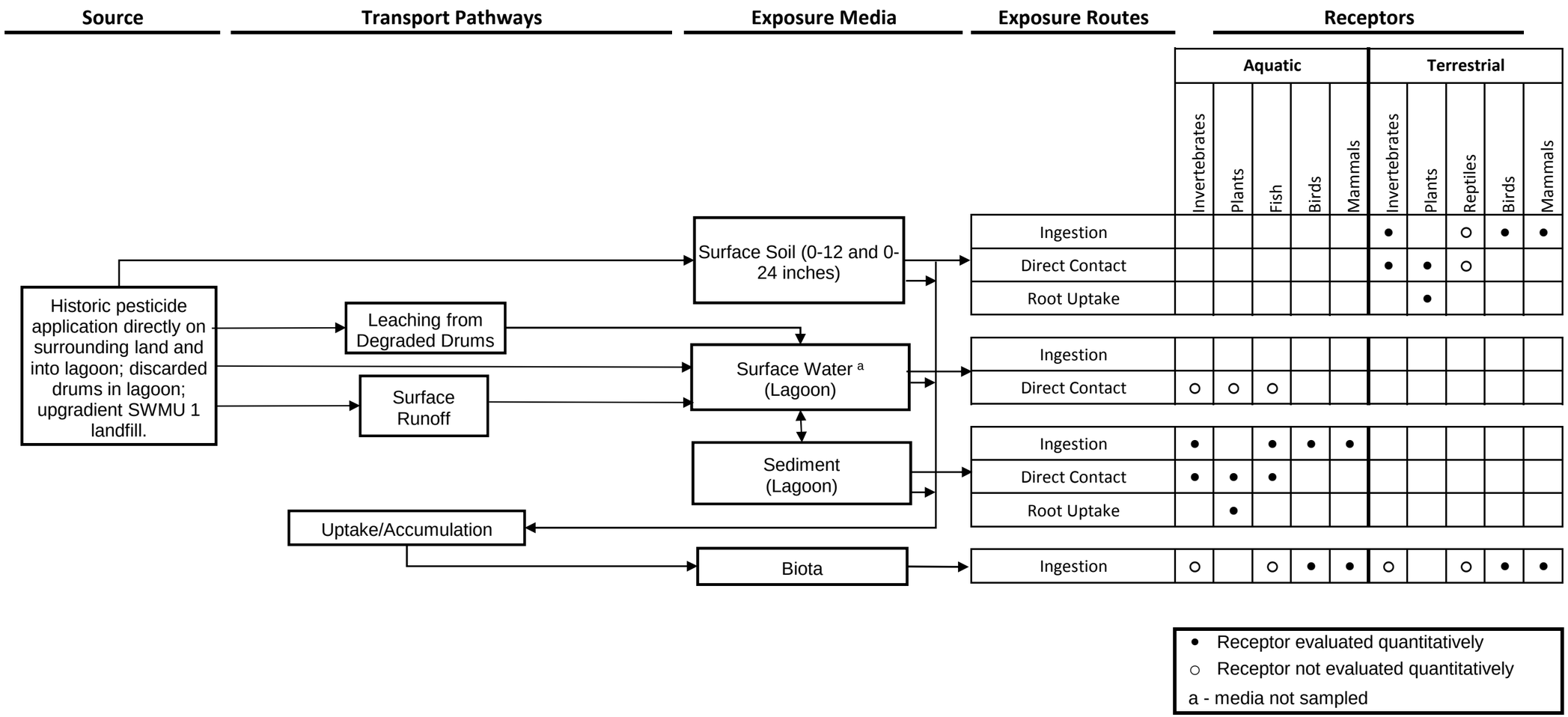


Figure D-2
Ecological Conceptual Site Model
Laguna La Chiva
Former Vieques Naval Training Range
Vieques, Puerto Rico

Attachment 1
Terrestrial Food Web Calculations

Attachment Table 1-1
Summary of Norway Rat Exposure Doses - Screening (Step 2)
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.11	11.20	1.23E+00	Regression	1.54E-02	0	4.10E-03	0.147	0.329	0.735	2.79E-02	1.25E-02	5.58E-03
4,4'-DDE	2.30	11.20	2.58E+01	Regression	1.52E-01	0	4.61E-02	0.147	0.329	0.735	3.14E-01	1.40E-01	6.28E-02
4,4'-DDT	0.11	11.20	1.23E+00	Regression	1.54E-02	0	4.10E-03	0.147	0.329	0.735	2.79E-02	1.25E-02	5.58E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0398 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.980 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.020 = Proportion of diet composed of soil
WIR = 0.0516 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.168 = Body weight (kg)

Attachment Table 1-2

Summary of Indian Mongoose Exposure Doses - Screening (Step 2)

Former NASD, Vieques, Puerto Rico

Chemical	Maximum Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Soil-Mammal BAF	Small Mammal Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.11	11.20	1.23E+00	Regression	1.54E-02	See footnote	1.73E-02	0	1.77E-01	0.147	0.329	0.735	1.20E+00	5.38E-01	2.41E-01
4,4'-DDE	2.30	11.20	2.58E+01	Regression	1.52E-01	See footnote	1.95E-01	0	3.70E+00	0.147	0.329	0.735	2.52E+01	1.13E+01	5.04E+00
4,4'-DDT	0.11	11.20	1.23E+00	Regression	1.54E-02	See footnote	1.73E-02	0	1.77E-01	0.147	0.329	0.735	1.20E+00	5.38E-01	2.41E-01

Concentration based on detection limits; chemical not detected

It was assumed that the concentration of each chemical in the small mammal's tissues was equal to the chemical concentration in its diet, that is, a diet to whole-body BAF of 1.0 was assumed

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0460 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.972 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (terrestrial plants)
FCxi = Chemical-specific = Concentration of chemical in food item (small mammals, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (small mammals)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.028 = Proportion of diet composed of soil
WIR = 0.0933 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.312 = Body weight (kg)

Attachment Table 1-3
Summary of Velvet Free-Tailed Bat Exposure Doses - Screening (Step 2)
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.11	11.20	1.23E+00	Regression	1.54E-02	0	2.93E-01	0.147	0.329	0.735	1.99E+00	8.91E-01	3.98E-01
4,4'-DDE	2.30	11.20	2.58E+01	Regression	1.52E-01	0	6.12E+00	0.147	0.329	0.735	4.16E+01	1.86E+01	8.33E+00
4,4'-DDT	0.11	11.20	1.23E+00	Regression	1.54E-02	0	2.93E-01	0.147	0.329	0.735	1.99E+00	8.91E-01	3.98E-01

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0019 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of soil
WIR = 0.0018 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0080 = Body weight (kg)

Attachment Table 1-4
Summary of Pearly-eyed Thrasher Exposure Doses - Screening (Step 2)
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.11	11.20	1.23E+00	Regression	1.54E-02	0	2.57E-01	0.50	1.58	5.00	5.14E-01	1.63E-01	5.14E-02
4,4'-DDE	2.30	11.20	2.58E+01	Regression	1.52E-01	0	5.37E+00	0.50	1.58	5.00	1.07E+01	3.40E+00	1.07E+00
4,4'-DDT	0.11	11.20	1.23E+00	Regression	1.54E-02	0	2.57E-01	0.50	1.58	5.00	5.14E-01	1.63E-01	5.14E-02

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0174 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.954 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.046 = Proportion of diet composed of soil
WIR = 0.0157 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.080 = Body weight (kg)

Attachment Table 1-5
Summary of Red-tailed Hawk Exposure Doses - Screening (Step 2)
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Soil-Mammal BAF	Small Mammal Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.11	11.20	1.23E+00	Regression	1.54E-02	See footnote	1.73E-02	0	7.15E-04	0.08	0.18	0.40	8.93E-03	3.99E-03	1.79E-03
4,4'-DDE	2.30	11.20	2.58E+01	Regression	1.52E-01	See footnote	1.95E-01	0	8.04E-03	0.08	0.18	0.40	1.01E-01	4.50E-02	2.01E-02
4,4'-DDT	0.11	11.20	1.23E+00	Regression	1.54E-02	See footnote	1.73E-02	0	7.15E-04	0.08	0.18	0.40	8.93E-03	3.99E-03	1.79E-03

Concentration based on detection limits; chemical not detected

It was assumed that the concentration of each chemical in the small mammal's tissues was equal to the chemical concentration in its diet, that is, a diet to whole-body BAF of 1.0 was assumed

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0395 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (terrestrial plants)
FCxi = Chemical-specific = Concentration of chemical in food item (small mammals, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (small mammals)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of soil
WIR = 0.0680 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.957 = Body weight (kg)

Attachment Table 1-6
Summary of Common Ground Dove Exposure Doses - Screening (Step 2)
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.11	11.20	1.23E+00	Regression	1.54E-02	0	7.33E-03	0.50	1.58	5.00	1.47E-02	4.63E-03	1.47E-03
4,4'-DDE	2.30	11.20	2.58E+01	Regression	1.52E-01	0	9.43E-02	0.50	1.58	5.00	1.89E-01	5.96E-02	1.89E-02
4,4'-DDT	0.11	11.20	1.23E+00	Regression	1.54E-02	0	7.33E-03	0.50	1.58	5.00	1.47E-02	4.63E-03	1.47E-03

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0081 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.950 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.050 = Proportion of diet composed of soil
WIR = 0.0070 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0224 = Body weight (kg)

Attachment Table 1-7
Summary of Cave Swallow Exposure Doses - Screening (Step 2)
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.11	11.20	1.23E+00	Regression	1.54E-02	0	3.75E-01	0.50	1.58	5.00	7.50E-01	2.37E-01	7.50E-02
4,4'-DDE	2.30	11.20	2.58E+01	Regression	1.52E-01	0	7.84E+00	0.50	1.58	5.00	1.57E+01	4.96E+00	1.57E+00
4,4'-DDT	0.11	11.20	1.23E+00	Regression	1.54E-02	0	3.75E-01	0.50	1.58	5.00	7.50E-01	2.37E-01	7.50E-02

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0044 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of soil
WIR = 0.0042 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0144 = Body weight (kg)

Attachment Table 1-8
Summary of Norway Rat Exposure Doses - Baseline (Step 3A) - 95% UCL
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.0236	Regression	2.34E-01	Regression	4.84E-03	0	1.17E-02	0.147	0.329	0.735	7.94E-02	3.55E-02	1.59E-02
4,4'-DDE	0.9675	Regression	1.16E+01	Regression	7.91E-02	0	5.68E-01	0.147	0.329	0.735	3.87E+00	1.73E+00	7.73E-01
4,4'-DDT	0.0236	Regression	3.23E-01	Regression	4.84E-03	0	1.60E-02	0.147	0.329	0.735	1.09E-01	4.86E-02	2.17E-02

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0207 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.490 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.490 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.020 = Proportion of diet composed of soil
WIR = 0.0242 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.209 = Body weight (kg)

Attachment Table 1-9
Summary of Indian Mongoose Exposure Doses - Baseline (Step 3A) - 95% UCL
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Soil-Mammal BAF	Small Mammal Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0236	Regression	2.34E-01	Regression	4.84E-03	See footnote	1.18E-01	0	9.09E-03	0.147	0.329	0.735	6.18E-02	2.76E-02	1.24E-02
4,4'-DDE	0.9675	Regression	1.16E+01	Regression	7.91E-02	See footnote	5.73E+00	0	4.46E-01	0.147	0.329	0.735	3.04E+00	1.36E+00	6.07E-01
4,4'-DDT	0.0236	Regression	3.23E-01	Regression	4.84E-03	See footnote	1.61E-01	0	1.25E-02	0.147	0.329	0.735	8.49E-02	3.80E-02	1.70E-02

Concentration based on detection limits; chemical not detected

It was assumed that the concentration of each chemical in the small mammal's tissues was equal to the chemical concentration in its diet, that is, a diet to whole-body BAF of 1.0 was assumed

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0285 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.564 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.111 = Proportion of diet composed of food item (terrestrial plants)
FCxi = Chemical-specific = Concentration of chemical in food item (small mammals, dry weight basis)
PDFi = 0.297 = Proportion of diet composed of food item (small mammals)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.028 = Proportion of diet composed of soil
WIR = 0.0557 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.528 = Body weight (kg)

Attachment Table 1-10
Summary of Velvet Free-Tailed Bat Exposure Doses - Baseline (Step 3A) - 95% UCL
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.0236	Regression	2.34E-01	Regression	4.84E-03	0	3.99E-02	0.147	0.329	0.735	2.72E-01	1.21E-01	5.43E-02
4,4'-DDE	0.9675	Regression	1.16E+01	Regression	7.91E-02	0	1.97E+00	0.147	0.329	0.735	1.34E+01	6.00E+00	2.68E+00
4,4'-DDT	0.0236	Regression	3.23E-01	Regression	4.84E-03	0	5.50E-02	0.147	0.329	0.735	3.74E-01	1.67E-01	7.49E-02

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0017 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of soil
WIR = 0.0016 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0101 = Body weight (kg)

Attachment Table 1-11
Summary of Pearly-eyed Thrasher Exposure Doses - Baseline (Step 3A) - 95% UCL
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.0236	Regression	2.34E-01	Regression	4.84E-03	0	2.12E-02	0.50	1.58	5.00	4.23E-02	1.34E-02	4.23E-03
4,4'-DDE	0.9675	Regression	1.16E+01	Regression	7.91E-02	0	1.04E+00	0.50	1.58	5.00	2.08E+00	6.58E-01	2.08E-01
4,4'-DDT	0.0236	Regression	3.23E-01	Regression	4.84E-03	0	2.91E-02	0.50	1.58	5.00	5.82E-02	1.84E-02	5.82E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0123 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.754 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.200 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.046 = Proportion of diet composed of soil
WIR = 0.0129 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.104 = Body weight (kg)

Attachment Table 1-12

Summary of Red-tailed Hawk Exposure Doses - Baseline (Step 3A) - 95% UCL

Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Soil-Mammal BAF	Small Mammal Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0236	Regression	2.34E-01	Regression	4.84E-03	See footnote	1.18E-01	0	3.76E-03	0.08	0.18	0.40	4.70E-02	2.10E-02	9.40E-03
4,4'-DDE	0.9675	Regression	1.16E+01	Regression	7.91E-02	See footnote	5.73E+00	0	1.83E-01	0.08	0.18	0.40	2.29E+00	1.02E+00	4.58E-01
4,4'-DDT	0.0236	Regression	3.23E-01	Regression	4.84E-03	See footnote	1.61E-01	0	5.15E-03	0.08	0.18	0.40	6.44E-02	2.88E-02	1.29E-02

Concentration based on detection limits; chemical not detected

It was assumed that the concentration of each chemical in the small mammal's tissues was equal to the chemical concentration in its diet, that is, a diet to whole-body BAF of 1.0 was assumed

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0363 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (terrestrial plants)
FCxi = Chemical-specific = Concentration of chemical in food item (small mammals, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (small mammals)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of soil
WIR = 0.0642 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 1.134 = Body weight (kg)

Attachment Table 1-13
Summary of Common Ground Dove Exposure Doses - Baseline (Step 3A) - 95% UCL
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.0236	Regression	2.34E-01	Regression	4.84E-03	0	1.24E-03	0.50	1.58	5.00	2.47E-03	7.82E-04	2.47E-04
4,4'-DDE	0.9675	Regression	1.16E+01	Regression	7.91E-02	0	2.65E-02	0.50	1.58	5.00	5.29E-02	1.67E-02	5.29E-03
4,4'-DDT	0.0236	Regression	3.23E-01	Regression	4.84E-03	0	1.24E-03	0.50	1.58	5.00	2.47E-03	7.82E-04	2.47E-04

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0069 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.950 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.050 = Proportion of diet composed of soil
WIR = 0.0059 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0320 = Body weight (kg)

Attachment Table 1-14
Summary of Cave Swallow Exposure Doses - Baseline (Step 3A) - 95% UCL
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.0236	Regression	2.34E-01	Regression	4.84E-03	0	5.60E-02	0.50	1.58	5.00	1.12E-01	3.54E-02	1.12E-02
4,4'-DDE	0.9675	Regression	1.16E+01	Regression	7.91E-02	0	2.77E+00	0.50	1.58	5.00	5.53E+00	1.75E+00	5.53E-01
4,4'-DDT	0.0236	Regression	3.23E-01	Regression	4.84E-03	0	7.72E-02	0.50	1.58	5.00	1.54E-01	4.88E-02	1.54E-02

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0038 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of soil
WIR = 0.0037 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0158 = Body weight (kg)

Attachment Table 1-15
Summary of Norway Rat Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
Former NASD, Vieques, Puerto Rico

Chemical	Mean Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.00855	Regression	1.15E-01	Regression	2.25E-03	0	5.74E-03	0.147	0.329	0.735	3.90E-02	1.74E-02	7.80E-03
4,4'-DDE	0.32926	Regression	4.48E+00	Regression	3.52E-02	0	2.20E-01	0.147	0.329	0.735	1.50E+00	6.70E-01	3.00E-01
4,4'-DDT	0.00855	Regression	1.34E-01	Regression	2.25E-03	0	6.63E-03	0.147	0.329	0.735	4.51E-02	2.02E-02	9.01E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0207 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.490 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.490 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.020 = Proportion of diet composed of soil
WIR = 0.0242 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.209 = Body weight (kg)

Attachment Table 1-16

Summary of Indian Mongoose Exposure Doses - Baseline (Step 3A) - Arithmetic Mean

Former NASD, Vieques, Puerto Rico

Chemical	Mean Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Soil-Mammal BAF	Small Mammal Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.00855	Regression	1.15E-01	Regression	2.25E-03	See footnote	5.78E-02	0	4.47E-03	0.147	0.329	0.735	3.04E-02	1.36E-02	6.08E-03
4,4'-DDE	0.32926	Regression	4.48E+00	Regression	3.52E-02	See footnote	2.22E+00	0	1.73E-01	0.147	0.329	0.735	1.18E+00	5.26E-01	2.35E-01
4,4'-DDT	0.00855	Regression	1.34E-01	Regression	2.25E-03	See footnote	6.67E-02	0	5.17E-03	0.147	0.329	0.735	3.52E-02	1.57E-02	7.03E-03

Concentration based on detection limits; chemical not detected

It was assumed that the concentration of each chemical in the small mammal's tissues was equal to the chemical concentration in its diet, that is, a diet to whole-body BAF of 1.0 was assumed

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0285 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.564 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.111 = Proportion of diet composed of food item (terrestrial plants)
FCxi = Chemical-specific = Concentration of chemical in food item (small mammals, dry weight basis)
PDFi = 0.297 = Proportion of diet composed of food item (small mammals)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.028 = Proportion of diet composed of soil
WIR = 0.0557 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.528 = Body weight (kg)

Attachment Table 1-17

Summary of Velvet Free-Tailed Bat Exposure Doses - Baseline (Step 3A) - Arithmetic Mean

Former NASD, Vieques, Puerto Rico

Chemical	Mean Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.00855	Regression	1.15E-01	Regression	2.25E-03	0	1.97E-02	0.147	0.329	0.735	1.34E-01	5.98E-02	2.68E-02
4,4'-DDE	0.32926	Regression	4.48E+00	Regression	3.52E-02	0	7.64E-01	0.147	0.329	0.735	5.20E+00	2.32E+00	1.04E+00
4,4'-DDT	0.00855	Regression	1.34E-01	Regression	2.25E-03	0	2.28E-02	0.147	0.329	0.735	1.55E-01	6.93E-02	3.10E-02

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0017 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of soil
WIR = 0.0016 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0101 = Body weight (kg)

Attachment Table 1-18

Summary of Pearly-eyed Thrasher Exposure Doses - Baseline (Step 3A) - Arithmetic Mean

Former NASD, Vieques, Puerto Rico

Chemical	Mean Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.00855	Regression	1.15E-01	Regression	2.25E-03	0	1.04E-02	0.50	1.58	5.00	2.08E-02	6.58E-03	2.08E-03
4,4'-DDE	0.32926	Regression	4.48E+00	Regression	3.52E-02	0	4.03E-01	0.50	1.58	5.00	8.05E-01	2.55E-01	8.05E-02
4,4'-DDT	0.00855	Regression	1.34E-01	Regression	2.25E-03	0	1.20E-02	0.50	1.58	5.00	2.41E-02	7.61E-03	2.41E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0123 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.754 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.200 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.046 = Proportion of diet composed of soil
WIR = 0.0129 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.104 = Body weight (kg)

Attachment Table 1-19

Summary of Red-tailed Hawk Exposure Doses - Baseline (Step 3A) - Arithmetic Mean

Former NASD, Vieques, Puerto Rico

Chemical	Mean Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Soil-Mammal BAF	Small Mammal Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.00855	Regression	1.15E-01	Regression	2.25E-03	See footnote	5.78E-02	0	1.85E-03	0.08	0.18	0.40	2.31E-02	1.03E-02	4.62E-03
4,4'-DDE	0.32926	Regression	4.48E+00	Regression	3.52E-02	See footnote	2.22E+00	0	7.10E-02	0.08	0.18	0.40	8.87E-01	3.97E-01	1.77E-01
4,4'-DDT	0.00855	Regression	1.34E-01	Regression	2.25E-03	See footnote	6.67E-02	0	2.14E-03	0.08	0.18	0.40	2.67E-02	1.19E-02	5.34E-03

Concentration based on detection limits; chemical not detected

It was assumed that the concentration of each chemical in the small mammal's tissues was equal to the chemical concentration in its diet, that is, a diet to whole-body BAF of 1.0 was assumed

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0363 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (terrestrial plants)
FCxi = Chemical-specific = Concentration of chemical in food item (small mammals, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (small mammals)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of soil
WIR = 0.0642 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 1.134 = Body weight (kg)

Attachment Table 1-20

Summary of Common Ground Dove Exposure Doses - Baseline (Step 3A) - Arithmetic Mean

Former NASD, Vieques, Puerto Rico

Chemical	Mean Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.00855	Regression	1.15E-01	Regression	2.25E-03	0	5.50E-04	0.50	1.58	5.00	1.10E-03	3.48E-04	1.10E-04
4,4'-DDE	0.32926	Regression	4.48E+00	Regression	3.52E-02	0	1.07E-02	0.50	1.58	5.00	2.14E-02	6.75E-03	2.14E-03
4,4'-DDT	0.00855	Regression	1.34E-01	Regression	2.25E-03	0	5.50E-04	0.50	1.58	5.00	1.10E-03	3.48E-04	1.10E-04

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0069 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.950 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.050 = Proportion of diet composed of soil
WIR = 0.0059 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0320 = Body weight (kg)

Attachment Table 1-21
Summary of Cave Swallow Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
Former NASD, Vieques, Puerto Rico

Chemical	Mean Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides													
4,4'-DDD	0.00855	Regression	1.15E-01	Regression	2.25E-03	0	2.76E-02	0.50	1.58	5.00	5.52E-02	1.74E-02	5.52E-03
4,4'-DDE	0.32926	Regression	4.48E+00	Regression	3.52E-02	0	1.07E+00	0.50	1.58	5.00	2.14E+00	6.77E-01	2.14E-01
4,4'-DDT	0.00855	Regression	1.34E-01	Regression	2.25E-03	0	3.20E-02	0.50	1.58	5.00	6.39E-02	2.02E-02	6.39E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0038 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (soil invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (terrestrial plants)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of soil
WIR = 0.0037 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0158 = Body weight (kg)

Attachment 2
Aquatic Food Web Calculations

Attachment Table 2-1
Summary of Green Heron Exposure Doses - Screening (Step 2)
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.150	2.36	3.54E-01	Regression	1.95E-02	8.1	1.21E+00	0	2.26E-01	0.30	0.95	3.00	7.52E-01	2.38E-01	7.52E-02
4,4'-DDE	0.020	2.36	4.72E-02	Regression	4.27E-03	91	1.82E+00	0	3.38E-01	0.30	0.95	3.00	1.13E+00	3.56E-01	1.13E-01
4,4'-DDT	0.054	0.43	2.32E-02	Regression	9.02E-03	9.2	4.97E-01	0	9.24E-02	0.30	0.95	3.00	3.08E-01	9.74E-02	3.08E-02
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0058	1.00	5.80E-03	1.000	5.80E-03	1.00	5.80E-03	0	1.08E-03	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	0.290	0.62	1.81E-01	0.792	2.30E-01	0.19	5.49E-02	0	1.02E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0058	0.48	2.80E-03	1.426	8.27E-03	0.92	5.34E-03	0	9.94E-04	32.2	71.9	161	3.09E-05	1.38E-05	6.18E-06
1,2-Dichlorobenzene	0.0058	1.00	5.80E-03	2.452	1.42E-02	0.59	3.42E-03	0	6.36E-04	32.2	71.9	161	1.98E-05	8.84E-06	3.95E-06
1,3-Dichlorobenzene	0.0058	1.00	5.80E-03	2.296	1.33E-02	0.11	6.11E-04	0	1.14E-04	32.2	71.9	161	3.53E-06	1.58E-06	7.06E-07
1,4-Dichlorobenzene	0.0058	1.00	5.80E-03	2.475	1.44E-02	0.07	4.27E-04	0	7.95E-05	32.2	71.9	161	2.47E-06	1.11E-06	4.94E-07
4-Bromophenyl-phenylether	0.290	1.00	2.90E-01	0.566	1.64E-01	1.00	2.90E-01	0	5.39E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.290	1.00	2.90E-01	0.593	1.72E-01	1.00	2.90E-01	0	5.39E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.290	0.86	2.49E-01	0.246	7.14E-02	0.47	1.37E-01	0	2.55E-02	0.113	0.253	0.565	2.26E-01	1.01E-01	4.52E-02
Hexachlorobutadiene	0.290	0.61	1.77E-01	0.675	1.96E-01	0.19	5.49E-02	0	1.02E-02	3.39	7.58	17.0	3.01E-03	1.35E-03	6.03E-04
Hexachlorocyclopentadiene	0.290	1.00	2.90E-01	0.393	1.14E-01	1.00	2.90E-01	0	5.39E-02	NA	NA	NA	NA	NA	NA
Hexachloroethane	0.290	1.00	2.90E-01	1.439	4.17E-01	1.00	2.90E-01	0	5.39E-02	NA	NA	NA	NA	NA	NA
Pentachlorophenol	1.300	1.00	1.30E+00	5.930	7.71E+00	2.16	2.81E+00	0	5.22E-01	6.73	21.3	67.3	7.75E-02	2.45E-02	7.75E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI =	Chemical-specific	= Dietary intake for chemical (mg chemical/kg body weight/day)
FIR =	0.0257	= Food ingestion rate (kg/day dry weight)
FCxi =	Chemical-specific	= Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi =	0.000	= Proportion of diet composed of food item (aquatic invertebrates)
FCxi =	Chemical-specific	= Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi =	0.000	= Proportion of diet composed of food item (aquatic plants)
FCxi =	Chemical-specific	= Concentration of chemical in food item (fish, dry weight basis)
PDFi =	1.000	= Proportion of diet composed of food item (fish)
SCx =	Chemical-specific	= Concentration of chemical in sediment (mg/kg, dry weight)
PDS =	0.000	= Proportion of diet composed of sediment
WIR =	0.0214	= Water ingestion rate (L/day)
WC =	Chemical-specific	= Concentration of chemical in water (mg/L)
BW =	0.138	= Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

Attachment Table 2-2
Summary of Spotted Sandpiper Exposure Doses - Screening (Step 2)
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.150	2.36	3.54E-01	Regression	1.95E-02	8.1	1.21E+00	0	1.13E-01	0.12	0.27	0.60	9.46E-01	4.23E-01	1.89E-01
4,4'-DDE	0.020	2.36	4.72E-02	Regression	4.27E-03	91	1.82E+00	0	1.51E-02	0.12	0.27	0.60	1.26E-01	5.64E-02	2.52E-02
4,4'-DDT	0.054	0.43	2.32E-02	Regression	9.02E-03	9.2	4.97E-01	0	1.03E-02	0.60	0.95	1.50	1.71E-02	1.08E-02	6.86E-03
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0058	1.00	5.80E-03	1.000	5.80E-03	1.00	5.80E-03	0	2.07E-03	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	0.290	0.62	1.81E-01	0.792	2.30E-01	0.19	5.49E-02	0	7.17E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0058	0.48	2.80E-03	1.426	8.27E-03	0.92	5.34E-03	0	1.19E-03	32.2	71.9	161	3.71E-05	1.66E-05	7.42E-06
1,2-Dichlorobenzene	0.0058	1.00	5.80E-03	2.452	1.42E-02	0.59	3.42E-03	0	2.07E-03	32.2	71.9	161	6.45E-05	2.88E-05	1.29E-05
1,3-Dichlorobenzene	0.0058	1.00	5.80E-03	2.296	1.33E-02	0.11	6.11E-04	0	2.07E-03	32.2	71.9	161	6.45E-05	2.88E-05	1.29E-05
1,4-Dichlorobenzene	0.0058	1.00	5.80E-03	2.475	1.44E-02	0.07	4.27E-04	0	2.07E-03	32.2	71.9	161	6.45E-05	2.88E-05	1.29E-05
4-Bromophenyl-phenylether	0.290	1.00	2.90E-01	0.566	1.64E-01	1.00	2.90E-01	0	1.04E-01	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.290	1.00	2.90E-01	0.593	1.72E-01	1.00	2.90E-01	0	1.04E-01	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.290	0.86	2.49E-01	0.246	7.14E-02	0.47	1.37E-01	0	9.16E-02	0.113	0.253	0.565	8.10E-01	3.62E-01	1.62E-01
Hexachlorobutadiene	0.290	0.61	1.77E-01	0.675	1.96E-01	0.19	5.49E-02	0	7.07E-02	3.39	7.58	17.0	2.09E-02	9.33E-03	4.17E-03
Hexachlorocyclopentadiene	0.290	1.00	2.90E-01	0.393	1.14E-01	1.00	2.90E-01	0	1.04E-01	NA	NA	NA	NA	NA	NA
Hexachloroethane	0.290	1.00	2.90E-01	1.439	4.17E-01	1.00	2.90E-01	0	1.04E-01	NA	NA	NA	NA	NA	NA
Pentachlorophenol	1.300	1.00	1.30E+00	5.930	7.71E+00	2.16	2.81E+00	0	4.65E-01	6.73	21.3	67.3	6.91E-02	2.18E-02	6.91E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0105 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.820 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.180 = Proportion of diet composed of sediment
WIR = 0.0089 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0294 = Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

Attachment Table 2-3
Summary of White-cheeked Pintail Exposure Doses - Screening (Step 2)
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.150	2.36	3.54E-01	Regression	1.95E-02	8.1	1.21E+00	0	3.13E-03	0.12	0.27	0.60	2.61E-02	1.17E-02	5.22E-03
4,4'-DDE	0.020	2.36	4.72E-02	Regression	4.27E-03	91	1.82E+00	0	6.31E-04	0.12	0.27	0.60	5.26E-03	2.35E-03	1.05E-03
4,4'-DDT	0.054	0.43	2.32E-02	Regression	9.02E-03	9.2	4.97E-01	0	1.38E-03	0.60	0.95	1.50	2.31E-03	1.46E-03	9.22E-04
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0058	1.00	5.80E-03	1.000	5.80E-03	1.00	5.80E-03	0	7.64E-04	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	0.290	0.62	1.81E-01	0.792	2.30E-01	0.19	5.49E-02	0	3.05E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0058	0.48	2.80E-03	1.426	8.27E-03	0.92	5.34E-03	0	1.08E-03	32.2	71.9	161	3.35E-05	1.50E-05	6.71E-06
1,2-Dichlorobenzene	0.0058	1.00	5.80E-03	2.452	1.42E-02	0.59	3.42E-03	0	1.84E-03	32.2	71.9	161	5.71E-05	2.55E-05	1.14E-05
1,3-Dichlorobenzene	0.0058	1.00	5.80E-03	2.296	1.33E-02	0.11	6.11E-04	0	1.72E-03	32.2	71.9	161	5.35E-05	2.39E-05	1.07E-05
1,4-Dichlorobenzene	0.0058	1.00	5.80E-03	2.475	1.44E-02	0.07	4.27E-04	0	1.85E-03	32.2	71.9	161	5.76E-05	2.58E-05	1.15E-05
4-Bromophenyl-phenylether	0.290	1.00	2.90E-01	0.566	1.64E-01	1.00	2.90E-01	0	2.21E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.290	1.00	2.90E-01	0.593	1.72E-01	1.00	2.90E-01	0	2.31E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.290	0.86	2.49E-01	0.246	7.14E-02	0.47	1.37E-01	0	1.04E-02	0.113	0.253	0.565	9.16E-02	4.10E-02	1.83E-02
Hexachlorobutadiene	0.290	0.61	1.77E-01	0.675	1.96E-01	0.19	5.49E-02	0	2.62E-02	3.39	7.58	17.0	7.73E-03	3.46E-03	1.55E-03
Hexachlorocyclopentadiene	0.290	1.00	2.90E-01	0.393	1.14E-01	1.00	2.90E-01	0	1.58E-02	NA	NA	NA	NA	NA	NA
Hexachloroethane	0.290	1.00	2.90E-01	1.439	4.17E-01	1.00	2.90E-01	0	5.44E-02	NA	NA	NA	NA	NA	NA
Pentachlorophenol	1.300	1.00	1.30E+00	5.930	7.71E+00	2.16	2.81E+00	0	9.87E-01	6.73	21.3	67.3	1.47E-01	4.64E-02	1.47E-02

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0529 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.967 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.033 = Proportion of diet composed of sediment
WIR = 0.0434 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.402 = Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

Attachment Table 2-4
Summary of Cave Swallow Exposure Doses - Screening (Step 2)
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.150	2.36	3.54E-01	Regression	1.95E-02	8.1	1.21E+00	0	1.08E-01	0.50	1.58	5.00	2.15E-01	6.81E-02	2.15E-02
4,4'-DDE	0.020	2.36	4.72E-02	Regression	4.27E-03	91	1.82E+00	0	1.44E-02	0.50	1.58	5.00	2.87E-02	9.09E-03	2.87E-03
4,4'-DDT	0.054	0.43	2.32E-02	Regression	9.02E-03	9.2	4.97E-01	0	7.07E-03	0.50	1.58	5.00	1.41E-02	4.47E-03	1.41E-03
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0058	1.00	5.80E-03	1.000	5.80E-03	1.00	5.80E-03	0	1.77E-03	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	0.290	0.62	1.81E-01	0.792	2.30E-01	0.19	5.49E-02	0	5.51E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0058	0.48	2.80E-03	1.426	8.27E-03	0.92	5.34E-03	0	8.51E-04	32.2	71.9	161	2.65E-05	1.18E-05	5.29E-06
1,2-Dichlorobenzene	0.0058	1.00	5.80E-03	2.452	1.42E-02	0.59	3.42E-03	0	1.77E-03	32.2	71.9	161	5.49E-05	2.46E-05	1.10E-05
1,3-Dichlorobenzene	0.0058	1.00	5.80E-03	2.296	1.33E-02	0.11	6.11E-04	0	1.77E-03	32.2	71.9	161	5.49E-05	2.46E-05	1.10E-05
1,4-Dichlorobenzene	0.0058	1.00	5.80E-03	2.475	1.44E-02	0.07	4.27E-04	0	1.77E-03	32.2	71.9	161	5.49E-05	2.46E-05	1.10E-05
4-Bromophenyl-phenylether	0.290	1.00	2.90E-01	0.566	1.64E-01	1.00	2.90E-01	0	8.83E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.290	1.00	2.90E-01	0.593	1.72E-01	1.00	2.90E-01	0	8.83E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.290	0.86	2.49E-01	0.246	7.14E-02	0.47	1.37E-01	0	7.57E-02	0.113	0.253	0.565	6.70E-01	2.99E-01	1.34E-01
Hexachlorobutadiene	0.290	0.61	1.77E-01	0.675	1.96E-01	0.19	5.49E-02	0	5.40E-02	3.39	7.58	17.0	1.59E-02	7.13E-03	3.19E-03
Hexachlorocyclopentadiene	0.290	1.00	2.90E-01	0.393	1.14E-01	1.00	2.90E-01	0	8.83E-02	NA	NA	NA	NA	NA	NA
Hexachloroethane	0.290	1.00	2.90E-01	1.439	4.17E-01	1.00	2.90E-01	0	8.83E-02	NA	NA	NA	NA	NA	NA
Pentachlorophenol	1.300	1.00	1.30E+00	5.930	7.71E+00	2.16	2.81E+00	0	3.96E-01	6.73	21.3	67.3	5.88E-02	1.86E-02	5.88E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0044 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0042 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0144 = Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

Attachment Table 2-5
Summary of Fishing Bat Exposure Doses - Screening (Step 2)
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.150	2.36	3.54E-01	Regression	1.95E-02	8.1	1.21E+00	0	2.70E-01	0.147	0.329	0.735	1.84E+00	8.21E-01	3.67E-01
4,4'-DDE	0.020	2.36	4.72E-02	Regression	4.27E-03	91	1.82E+00	0	4.04E-01	0.147	0.329	0.735	2.75E+00	1.23E+00	5.50E-01
4,4'-DDT	0.054	0.43	2.32E-02	Regression	9.02E-03	9.2	4.97E-01	0	1.10E-01	0.147	0.329	0.735	7.51E-01	3.36E-01	1.50E-01
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0058	1.00	5.80E-03	1.000	5.80E-03	1.00	5.80E-03	0	1.29E-03	76.0	170	380	1.70E-05	7.59E-06	3.39E-06
1,2,4,5-Tetrachlorobenzene	0.290	0.62	1.81E-01	0.792	2.30E-01	0.19	5.49E-02	0	1.22E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0058	0.48	2.80E-03	1.426	8.27E-03	0.92	5.34E-03	0	1.19E-03	53.0	75.0	106	2.24E-05	1.58E-05	1.12E-05
1,2-Dichlorobenzene	0.0058	1.00	5.80E-03	2.452	1.42E-02	0.59	3.42E-03	0	7.60E-04	85.7	192	429	8.87E-06	3.97E-06	1.77E-06
1,3-Dichlorobenzene	0.0058	1.00	5.80E-03	2.296	1.33E-02	0.11	6.11E-04	0	1.36E-04	85.7	192	429	1.58E-06	7.08E-07	3.17E-07
1,4-Dichlorobenzene	0.0058	1.00	5.80E-03	2.475	1.44E-02	0.07	4.27E-04	0	9.50E-05	30.0	52.0	90.0	3.17E-06	1.83E-06	1.06E-06
4-Bromophenyl-phenylether	0.290	1.00	2.90E-01	0.566	1.64E-01	1.00	2.90E-01	0	6.45E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.290	1.00	2.90E-01	0.593	1.72E-01	1.00	2.90E-01	0	6.45E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.290	0.86	2.49E-01	0.246	7.14E-02	0.47	1.37E-01	0	3.05E-02	2.00	2.83	4.00	1.53E-02	1.08E-02	7.64E-03
Hexachlorobutadiene	0.290	0.61	1.77E-01	0.675	1.96E-01	0.19	5.49E-02	0	1.22E-02	2.00	6.32	20.0	6.11E-03	1.93E-03	6.11E-04
Hexachlorocyclopentadiene	0.290	1.00	2.90E-01	0.393	1.14E-01	1.00	2.90E-01	0	6.45E-02	75.0	168	375	8.60E-04	3.84E-04	1.72E-04
Hexachloroethane	0.290	1.00	2.90E-01	1.439	4.17E-01	1.00	2.90E-01	0	6.45E-02	100	224	500	6.45E-04	2.88E-04	1.29E-04
Pentachlorophenol	1.300	1.00	1.30E+00	5.930	7.71E+00	2.16	2.81E+00	0	6.24E-01	8.42	18.8	42.1	7.41E-02	3.31E-02	1.48E-02

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0070 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0103 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0314 = Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

Attachment Table 2-6
Summary of Velvet Free-Tailed Bat Exposure Doses - Screening (Step 2)
Former NASD, Vieques, Puerto Rico

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.150	2.36	3.54E-01	Regression	1.95E-02	8.1	1.21E+00	0	8.41E-02	0.147	0.329	0.735	5.72E-01	2.56E-01	1.14E-01
4,4'-DDE	0.020	2.36	4.72E-02	Regression	4.27E-03	91	1.82E+00	0	1.12E-02	0.147	0.329	0.735	7.63E-02	3.41E-02	1.53E-02
4,4'-DDT	0.054	0.43	2.32E-02	Regression	9.02E-03	9.2	4.97E-01	0	5.52E-03	0.147	0.329	0.735	3.75E-02	1.68E-02	7.51E-03
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0058	1.00	5.80E-03	1.000	5.80E-03	1.00	5.80E-03	0	1.38E-03	76.0	170	380	1.81E-05	8.11E-06	3.63E-06
1,2,4,5-Tetrachlorobenzene	0.290	0.62	1.81E-01	0.792	2.30E-01	0.19	5.49E-02	0	4.30E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0058	0.48	2.80E-03	1.426	8.27E-03	0.92	5.34E-03	0	6.64E-04	53.0	75.0	106	1.25E-05	8.86E-06	6.27E-06
1,2-Dichlorobenzene	0.0058	1.00	5.80E-03	2.452	1.42E-02	0.59	3.42E-03	0	1.38E-03	85.7	192	429	1.61E-05	7.19E-06	3.22E-06
1,3-Dichlorobenzene	0.0058	1.00	5.80E-03	2.296	1.33E-02	0.11	6.11E-04	0	1.38E-03	85.7	192	429	1.61E-05	7.19E-06	3.22E-06
1,4-Dichlorobenzene	0.0058	1.00	5.80E-03	2.475	1.44E-02	0.07	4.27E-04	0	1.38E-03	30.0	52.0	90.0	4.59E-05	2.65E-05	1.53E-05
4-Bromophenyl-phenylether	0.290	1.00	2.90E-01	0.566	1.64E-01	1.00	2.90E-01	0	6.89E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.290	1.00	2.90E-01	0.593	1.72E-01	1.00	2.90E-01	0	6.89E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.290	0.86	2.49E-01	0.246	7.14E-02	0.47	1.37E-01	0	5.91E-02	2.00	2.83	4.00	2.95E-02	2.09E-02	1.48E-02
Hexachlorobutadiene	0.290	0.61	1.77E-01	0.675	1.96E-01	0.19	5.49E-02	0	4.22E-02	2.00	6.32	20.0	2.11E-02	6.67E-03	2.11E-03
Hexachlorocyclopentadiene	0.290	1.00	2.90E-01	0.393	1.14E-01	1.00	2.90E-01	0	6.89E-02	75.0	168	375	9.19E-04	4.11E-04	1.84E-04
Hexachloroethane	0.290	1.00	2.90E-01	1.439	4.17E-01	1.00	2.90E-01	0	6.89E-02	100	224	500	6.89E-04	3.08E-04	1.38E-04
Pentachlorophenol	1.300	1.00	1.30E+00	5.930	7.71E+00	2.16	2.81E+00	0	3.09E-01	8.42	18.8	42.1	3.67E-02	1.64E-02	7.34E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0019 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0018 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.008 = Body weight (kg)

Attachment Table 2-7
Summary of Green Heron Exposure Doses - Baseline (Step 3A) - 95% UCL
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0466	2.36	1.10E-01	Regression	8.08E-03	3.9	1.81E-01	0	1.97E-02	0.30	0.95	3.00	6.57E-02	2.08E-02	6.57E-03
4,4'-DDE	0.0132	2.36	3.12E-02	Regression	3.13E-03	6.4	8.47E-02	0	8.49E-03	0.30	0.95	3.00	2.83E-02	8.95E-03	2.83E-03
4,4'-DDT	0.0153	0.31	4.76E-03	Regression	3.49E-03	4.2	6.41E-02	0	5.76E-03	0.30	0.95	3.00	1.92E-02	6.07E-03	1.92E-03
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0018	1.00	1.83E-03	1.000	1.83E-03	1.00	1.83E-03	0	2.25E-04	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	0.1229	0.40	4.88E-02	0.792	9.73E-02	0.19	2.33E-02	0	3.77E-03	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0018	0.26	4.71E-04	1.426	2.62E-03	0.69	1.27E-03	0	1.28E-04	32.2	71.9	161	3.98E-06	1.78E-06	7.95E-07
1,2-Dichlorobenzene	0.0018	1.00	1.83E-03	2.452	4.50E-03	0.59	1.08E-03	0	1.60E-04	32.2	71.9	161	4.96E-06	2.22E-06	9.93E-07
1,3-Dichlorobenzene	0.0018	1.00	1.83E-03	2.296	4.21E-03	0.11	1.93E-04	0	8.22E-05	32.2	71.9	161	2.55E-06	1.14E-06	5.11E-07
1,4-Dichlorobenzene	0.0018	1.00	1.83E-03	2.475	4.54E-03	0.07	1.35E-04	0	7.71E-05	32.2	71.9	161	2.40E-06	1.07E-06	4.80E-07
4-Bromophenyl-phenylether	0.1229	1.00	1.23E-01	0.566	6.95E-02	1.00	1.23E-01	0	1.51E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.1229	1.00	1.23E-01	0.593	7.28E-02	1.00	1.23E-01	0	1.51E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.1229	0.51	6.29E-02	0.246	3.03E-02	0.47	5.82E-02	0	7.31E-03	0.113	0.253	0.565	6.47E-02	2.89E-02	1.29E-02
Hexachlorobutadiene	0.1229	0.39	4.73E-02	0.675	8.30E-02	0.19	2.33E-02	0	3.71E-03	3.39	7.58	17.0	1.10E-03	4.90E-04	2.19E-04
Hexachlorocyclopentadiene	0.1229	1.00	1.23E-01	0.393	4.83E-02	1.00	1.23E-01	0	1.51E-02	NA	NA	NA	NA	NA	NA
Hexachloroethane	0.1229	1.00	1.23E-01	1.439	1.77E-01	1.00	1.23E-01	0	1.51E-02	NA	NA	NA	NA	NA	NA
Pentachlorophenol	0.4281	1.00	4.28E-01	5.930	2.54E+00	2.16	9.24E-01	0	9.58E-02	6.73	21.3	67.3	1.42E-02	4.50E-03	1.42E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0230 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.290 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.710 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0192 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.187 = Body weight (kg)

Attachment Table 2-8
Summary of Spotted Sandpiper Exposure Doses - Baseline (Step 3A) - 95% UCL
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0466	2.36	1.10E-01	Regression	8.08E-03	3.9	1.81E-01	0	1.96E-02	0.12	0.27	0.60	1.63E-01	7.31E-02	3.27E-02
4,4'-DDE	0.0132	2.36	3.12E-02	Regression	3.13E-03	6.4	8.47E-02	0	5.57E-03	0.12	0.27	0.60	4.64E-02	2.07E-02	9.28E-03
4,4'-DDT	0.0153	0.31	4.76E-03	Regression	3.49E-03	4.2	6.41E-02	0	1.32E-03	0.60	0.95	1.50	2.21E-03	1.39E-03	8.82E-04
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0018	1.00	1.83E-03	1.000	1.83E-03	1.00	1.83E-03	0	3.65E-04	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	0.1229	0.40	4.88E-02	0.792	9.73E-02	0.19	2.33E-02	0	1.24E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0018	0.26	4.71E-04	1.426	2.62E-03	0.69	1.27E-03	0	1.43E-04	32.2	71.9	161	4.43E-06	1.98E-06	8.87E-07
1,2-Dichlorobenzene	0.0018	1.00	1.83E-03	2.452	4.50E-03	0.59	1.08E-03	0	3.65E-04	32.2	71.9	161	1.13E-05	5.08E-06	2.27E-06
1,3-Dichlorobenzene	0.0018	1.00	1.83E-03	2.296	4.21E-03	0.11	1.93E-04	0	3.65E-04	32.2	71.9	161	1.13E-05	5.08E-06	2.27E-06
1,4-Dichlorobenzene	0.0018	1.00	1.83E-03	2.475	4.54E-03	0.07	1.35E-04	0	3.65E-04	32.2	71.9	161	1.13E-05	5.08E-06	2.27E-06
4-Bromophenyl-phenylether	0.1229	1.00	1.23E-01	0.566	6.95E-02	1.00	1.23E-01	0	2.44E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.1229	1.00	1.23E-01	0.593	7.28E-02	1.00	1.23E-01	0	2.44E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.1229	0.51	6.29E-02	0.246	3.03E-02	0.47	5.82E-02	0	1.47E-02	0.113	0.253	0.565	1.30E-01	5.80E-02	2.60E-02
Hexachlorobutadiene	0.1229	0.39	4.73E-02	0.675	8.30E-02	0.19	2.33E-02	0	1.21E-02	3.39	7.58	17.0	3.57E-03	1.60E-03	7.15E-04
Hexachlorocyclopentadiene	0.1229	1.00	1.23E-01	0.393	4.83E-02	1.00	1.23E-01	0	2.44E-02	NA	NA	NA	NA	NA	NA
Hexachloroethane	0.1229	1.00	1.23E-01	1.439	1.77E-01	1.00	1.23E-01	0	2.44E-02	NA	NA	NA	NA	NA	NA
Pentachlorophenol	0.4281	1.00	4.28E-01	5.930	2.54E+00	2.16	9.24E-01	0	8.52E-02	6.73	21.3	67.3	1.27E-02	4.00E-03	1.27E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0080 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.820 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.180 = Proportion of diet composed of sediment
WIR = 0.0069 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0404 = Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

Attachment Table 2-9
Summary of White-cheeked Pintail Exposure Doses - Baseline (Step 3A) - 95% UCL
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0466	2.36	1.10E-01	Regression	8.08E-03	3.9	1.81E-01	0	1.41E-03	0.12	0.27	0.60	1.18E-02	5.27E-03	2.36E-03
4,4'-DDE	0.0132	2.36	3.12E-02	Regression	3.13E-03	6.4	8.47E-02	0	4.69E-04	0.12	0.27	0.60	3.91E-03	1.75E-03	7.81E-04
4,4'-DDT	0.0153	0.31	4.76E-03	Regression	3.49E-03	4.2	6.41E-02	0	3.53E-04	0.60	0.95	1.50	5.88E-04	3.72E-04	2.35E-04
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0018	1.00	1.83E-03	1.000	1.83E-03	1.00	1.83E-03	0	1.63E-04	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	0.1229	0.40	4.88E-02	0.792	9.73E-02	0.19	2.33E-02	0	8.46E-03	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0018	0.26	4.71E-04	1.426	2.62E-03	0.69	1.27E-03	0	2.18E-04	32.2	71.9	161	6.79E-06	3.04E-06	1.36E-06
1,2-Dichlorobenzene	0.0018	1.00	1.83E-03	2.452	4.50E-03	0.59	1.08E-03	0	3.77E-04	32.2	71.9	161	1.17E-05	5.25E-06	2.35E-06
1,3-Dichlorobenzene	0.0018	1.00	1.83E-03	2.296	4.21E-03	0.11	1.93E-04	0	3.55E-04	32.2	71.9	161	1.10E-05	4.93E-06	2.21E-06
1,4-Dichlorobenzene	0.0018	1.00	1.83E-03	2.475	4.54E-03	0.07	1.35E-04	0	3.81E-04	32.2	71.9	161	1.18E-05	5.30E-06	2.37E-06
4-Bromophenyl-phenylether	0.1229	1.00	1.23E-01	0.566	6.95E-02	1.00	1.23E-01	0	6.65E-03	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.1229	1.00	1.23E-01	0.593	7.28E-02	1.00	1.23E-01	0	6.92E-03	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.1229	0.51	6.29E-02	0.246	3.03E-02	0.47	5.82E-02	0	3.15E-03	0.113	0.253	0.565	2.79E-02	1.25E-02	5.58E-03
Hexachlorobutadiene	0.1229	0.39	4.73E-02	0.675	8.30E-02	0.19	2.33E-02	0	7.30E-03	3.39	7.58	17.0	2.15E-03	9.64E-04	4.31E-04
Hexachlorocyclopentadiene	0.1229	1.00	1.23E-01	0.393	4.83E-02	1.00	1.23E-01	0	4.94E-03	NA	NA	NA	NA	NA	NA
Hexachloroethane	0.1229	1.00	1.23E-01	1.439	1.77E-01	1.00	1.23E-01	0	1.53E-02	NA	NA	NA	NA	NA	NA
Pentachlorophenol	0.4281	1.00	4.28E-01	5.930	2.54E+00	2.16	9.24E-01	0	2.08E-01	6.73	21.3	67.3	3.09E-02	9.77E-03	3.09E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0462 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.064 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.903 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.033 = Proportion of diet composed of sediment
WIR = 0.0380 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.519 = Body weight (kg)

Attachment Table 2-10
Summary of Cave Swallow Exposure Doses - Baseline (Step 3A) - 95% UCL
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0466	2.36	1.10E-01	Regression	8.08E-03	3.9	1.81E-01	0	2.63E-02	0.50	1.58	5.00	5.26E-02	1.66E-02	5.26E-03
4,4'-DDE	0.0132	2.36	3.12E-02	Regression	3.13E-03	6.4	8.47E-02	0	7.47E-03	0.50	1.58	5.00	1.49E-02	4.72E-03	1.49E-03
4,4'-DDT	0.0153	0.31	4.76E-03	Regression	3.49E-03	4.2	6.41E-02	0	1.14E-03	0.50	1.58	5.00	2.28E-03	7.19E-04	2.28E-04
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0018	1.00	1.83E-03	1.000	1.83E-03	1.00	1.83E-03	0	4.39E-04	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	0.1229	0.40	4.88E-02	0.792	9.73E-02	0.19	2.33E-02	0	1.17E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0018	0.26	4.71E-04	1.426	2.62E-03	0.69	1.27E-03	0	1.13E-04	32.2	71.9	161	3.51E-06	1.57E-06	7.01E-07
1,2-Dichlorobenzene	0.0018	1.00	1.83E-03	2.452	4.50E-03	0.59	1.08E-03	0	4.39E-04	32.2	71.9	161	1.36E-05	6.10E-06	2.73E-06
1,3-Dichlorobenzene	0.0018	1.00	1.83E-03	2.296	4.21E-03	0.11	1.93E-04	0	4.39E-04	32.2	71.9	161	1.36E-05	6.10E-06	2.73E-06
1,4-Dichlorobenzene	0.0018	1.00	1.83E-03	2.475	4.54E-03	0.07	1.35E-04	0	4.39E-04	32.2	71.9	161	1.36E-05	6.10E-06	2.73E-06
4-Bromophenyl-phenylether	0.1229	1.00	1.23E-01	0.566	6.95E-02	1.00	1.23E-01	0	2.94E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.1229	1.00	1.23E-01	0.593	7.28E-02	1.00	1.23E-01	0	2.94E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.1229	0.51	6.29E-02	0.246	3.03E-02	0.47	5.82E-02	0	1.50E-02	0.113	0.253	0.565	1.33E-01	5.96E-02	2.66E-02
Hexachlorobutadiene	0.1229	0.39	4.73E-02	0.675	8.30E-02	0.19	2.33E-02	0	1.13E-02	3.39	7.58	17.0	3.34E-03	1.49E-03	6.68E-04
Hexachlorocyclopentadiene	0.1229	1.00	1.23E-01	0.393	4.83E-02	1.00	1.23E-01	0	2.94E-02	NA	NA	NA	NA	NA	NA
Hexachloroethane	0.1229	1.00	1.23E-01	1.439	1.77E-01	1.00	1.23E-01	0	2.94E-02	NA	NA	NA	NA	NA	NA
Pentachlorophenol	0.4281	1.00	4.28E-01	5.930	2.54E+00	2.16	9.24E-01	0	1.02E-01	6.73	21.3	67.3	1.52E-02	4.81E-03	1.52E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0038 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0037 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0158 = Body weight (kg)

Attachment Table 2-11
Summary of Fishing Bat Exposure Doses - Baseline (Step 3A) - 95% UCL
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0466	2.36	1.10E-01	Regression	8.08E-03	3.9	1.81E-01	0	1.78E-02	0.147	0.329	0.735	1.21E-01	5.40E-02	2.42E-02
4,4'-DDE	0.0132	2.36	3.12E-02	Regression	3.13E-03	6.4	8.47E-02	0	8.30E-03	0.147	0.329	0.735	5.64E-02	2.52E-02	1.13E-02
4,4'-DDT	0.0153	0.31	4.76E-03	Regression	3.49E-03	4.2	6.41E-02	0	6.28E-03	0.147	0.329	0.735	4.27E-02	1.91E-02	8.54E-03
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0018	1.00	1.83E-03	1.000	1.83E-03	1.00	1.83E-03	0	1.80E-04	76.0	170	380	2.37E-06	1.06E-06	4.73E-07
1,2,4,5-Tetrachlorobenzene	0.1229	0.40	4.88E-02	0.792	9.73E-02	0.19	2.33E-02	0	2.28E-03	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0018	0.26	4.71E-04	1.426	2.62E-03	0.69	1.27E-03	0	1.25E-04	53.0	75.0	106	2.36E-06	1.67E-06	1.18E-06
1,2-Dichlorobenzene	0.0018	1.00	1.83E-03	2.452	4.50E-03	0.59	1.08E-03	0	1.06E-04	85.7	192	429	1.24E-06	5.53E-07	2.47E-07
1,3-Dichlorobenzene	0.0018	1.00	1.83E-03	2.296	4.21E-03	0.11	1.93E-04	0	1.89E-05	85.7	192	429	2.21E-07	9.88E-08	4.42E-08
1,4-Dichlorobenzene	0.0018	1.00	1.83E-03	2.475	4.54E-03	0.07	1.35E-04	0	1.32E-05	30.0	52.0	90.0	4.42E-07	2.55E-07	1.47E-07
4-Bromophenyl-phenylether	0.1229	1.00	1.23E-01	0.566	6.95E-02	1.00	1.23E-01	0	1.20E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.1229	1.00	1.23E-01	0.593	7.28E-02	1.00	1.23E-01	0	1.20E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.1229	0.51	6.29E-02	0.246	3.03E-02	0.47	5.82E-02	0	5.70E-03	2.00	2.83	4.00	2.85E-03	2.02E-03	1.43E-03
Hexachlorobutadiene	0.1229	0.39	4.73E-02	0.675	8.30E-02	0.19	2.33E-02	0	2.28E-03	2.00	6.32	20.0	1.14E-03	3.61E-04	1.14E-04
Hexachlorocyclopentadiene	0.1229	1.00	1.23E-01	0.393	4.83E-02	1.00	1.23E-01	0	1.20E-02	75.0	168	375	1.61E-04	7.18E-05	3.21E-05
Hexachloroethane	0.1229	1.00	1.23E-01	1.439	1.77E-01	1.00	1.23E-01	0	1.20E-02	100	224	500	1.20E-04	5.39E-05	2.41E-05
Pentachlorophenol	0.4281	1.00	4.28E-01	5.930	2.54E+00	2.16	9.24E-01	0	9.05E-02	8.42	18.8	42.1	1.08E-02	4.81E-03	2.15E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0053 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0072 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0544 = Body weight (kg)

Attachment Table 2-12
Summary of Velvet Free-Tailed Bat Exposure Doses - Baseline (Step 3A) - 95% UCL
Former NASD, Vieques, Puerto Rico

Chemical	95% UCL Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	95% UCL Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0466	2.36	1.10E-01	Regression	8.08E-03	3.9	1.81E-01	0	1.88E-02	0.147	0.329	0.735	1.28E-01	5.70E-02	2.55E-02
4,4'-DDE	0.0132	2.36	3.12E-02	Regression	3.13E-03	6.4	8.47E-02	0	5.32E-03	0.147	0.329	0.735	3.62E-02	1.62E-02	7.24E-03
4,4'-DDT	0.0153	0.31	4.76E-03	Regression	3.49E-03	4.2	6.41E-02	0	8.11E-04	0.147	0.329	0.735	5.52E-03	2.47E-03	1.10E-03
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0018	1.00	1.83E-03	1.000	1.83E-03	1.00	1.83E-03	0	3.13E-04	76.0	170	380	4.12E-06	1.84E-06	8.23E-07
1,2,4,5-Tetrachlorobenzene	0.1229	0.40	4.88E-02	0.792	9.73E-02	0.19	2.33E-02	0	8.32E-03	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0018	0.26	4.71E-04	1.426	2.62E-03	0.69	1.27E-03	0	8.04E-05	53.0	75.0	106	1.52E-06	1.07E-06	7.59E-07
1,2-Dichlorobenzene	0.0018	1.00	1.83E-03	2.452	4.50E-03	0.59	1.08E-03	0	3.13E-04	85.7	192	429	3.65E-06	1.63E-06	7.30E-07
1,3-Dichlorobenzene	0.0018	1.00	1.83E-03	2.296	4.21E-03	0.11	1.93E-04	0	3.13E-04	85.7	192	429	3.65E-06	1.63E-06	7.30E-07
1,4-Dichlorobenzene	0.0018	1.00	1.83E-03	2.475	4.54E-03	0.07	1.35E-04	0	3.13E-04	30.0	52.0	90.0	1.04E-05	6.02E-06	3.48E-06
4-Bromophenyl-phenylether	0.1229	1.00	1.23E-01	0.566	6.95E-02	1.00	1.23E-01	0	2.10E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.1229	1.00	1.23E-01	0.593	7.28E-02	1.00	1.23E-01	0	2.10E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.1229	0.51	6.29E-02	0.246	3.03E-02	0.47	5.82E-02	0	1.07E-02	2.00	2.83	4.00	5.36E-03	3.79E-03	2.68E-03
Hexachlorobutadiene	0.1229	0.39	4.73E-02	0.675	8.30E-02	0.19	2.33E-02	0	8.07E-03	2.00	6.32	20.0	4.03E-03	1.28E-03	4.03E-04
Hexachlorocyclopentadiene	0.1229	1.00	1.23E-01	0.393	4.83E-02	1.00	1.23E-01	0	2.10E-02	75.0	168	375	2.79E-04	1.25E-04	5.59E-05
Hexachloroethane	0.1229	1.00	1.23E-01	1.439	1.77E-01	1.00	1.23E-01	0	2.10E-02	100	224	500	2.10E-04	9.37E-05	4.19E-05
Pentachlorophenol	0.4281	1.00	4.28E-01	5.930	2.54E+00	2.16	9.24E-01	0	7.30E-02	8.42	18.8	42.1	8.67E-03	3.88E-03	1.73E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0017 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0016 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0101 = Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

Attachment Table 2-13
Summary of Green Heron Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
Former NASD, Vieques, Puerto Rico

Chemical	Mean Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0233	2.36	5.50E-02	Regression	4.80E-03	3.9	9.06E-02	0	9.86E-03	0.30	0.95	3.00	3.29E-02	1.04E-02	3.29E-03
4,4'-DDE	0.0094	2.36	2.21E-02	Regression	2.41E-03	6.4	5.99E-02	0	6.01E-03	0.30	0.95	3.00	2.00E-02	6.34E-03	2.00E-03
4,4'-DDT	0.0077	0.31	2.38E-03	Regression	2.07E-03	4.2	3.21E-02	0	2.88E-03	0.30	0.95	3.00	9.61E-03	3.04E-03	9.61E-04
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0015	1.00	1.48E-03	1.000	1.48E-03	1.00	1.48E-03	0	1.82E-04	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	0.1083	0.40	4.30E-02	0.792	8.58E-02	0.19	2.05E-02	0	3.32E-03	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0015	0.26	3.81E-04	1.426	2.12E-03	0.69	1.03E-03	0	1.03E-04	32.2	71.9	161	3.22E-06	1.44E-06	6.43E-07
1,2-Dichlorobenzene	0.0015	1.00	1.48E-03	2.452	3.64E-03	0.59	8.74E-04	0	1.29E-04	32.2	71.9	161	4.01E-06	1.79E-06	8.03E-07
1,3-Dichlorobenzene	0.0015	1.00	1.48E-03	2.296	3.41E-03	0.11	1.56E-04	0	6.64E-05	32.2	71.9	161	2.07E-06	9.24E-07	4.13E-07
1,4-Dichlorobenzene	0.0015	1.00	1.48E-03	2.475	3.67E-03	0.07	1.09E-04	0	6.24E-05	32.2	71.9	161	1.94E-06	8.67E-07	3.88E-07
4-Bromophenyl-phenylether	0.1083	1.00	1.08E-01	0.566	6.13E-02	1.00	1.08E-01	0	1.33E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.1083	1.00	1.08E-01	0.593	6.42E-02	1.00	1.08E-01	0	1.33E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.1083	0.51	5.55E-02	0.246	2.67E-02	0.47	5.13E-02	0	6.45E-03	0.113	0.253	0.565	5.71E-02	2.55E-02	1.14E-02
Hexachlorobutadiene	0.1083	0.39	4.17E-02	0.675	7.32E-02	0.19	2.05E-02	0	3.27E-03	3.39	7.58	17.0	9.66E-04	4.32E-04	1.93E-04
Hexachlorocyclopentadiene	0.1083	1.00	1.08E-01	0.393	4.26E-02	1.00	1.08E-01	0	1.33E-02	NA	NA	NA	NA	NA	NA
Hexachloroethane	0.1083	1.00	1.08E-01	1.439	1.56E-01	1.00	1.08E-01	0	1.33E-02	NA	NA	NA	NA	NA	NA
Pentachlorophenol	0.3580	1.00	3.58E-01	5.930	2.12E+00	2.16	7.73E-01	0	8.01E-02	6.73	21.3	67.3	1.19E-02	3.76E-03	1.19E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0230 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.290 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.710 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0192 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.187 = Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

Attachment Table 2-14
Summary of Spotted Sandpiper Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
Former NASD, Vieques, Puerto Rico

Chemical	Mean Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0233	2.36	5.50E-02	Regression	4.80E-03	3.9	9.06E-02	0	9.81E-03	0.12	0.27	0.60	8.17E-02	3.66E-02	1.63E-02
4,4'-DDE	0.0094	2.36	2.21E-02	Regression	2.41E-03	6.4	5.99E-02	0	3.94E-03	0.12	0.27	0.60	3.28E-02	1.47E-02	6.57E-03
4,4'-DDT	0.0077	0.31	2.38E-03	Regression	2.07E-03	4.2	3.21E-02	0	6.62E-04	0.60	0.95	1.50	1.10E-03	6.98E-04	4.42E-04
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0015	1.00	1.48E-03	1.000	1.48E-03	1.00	1.48E-03	0	2.95E-04	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	0.1083	0.40	4.30E-02	0.792	8.58E-02	0.19	2.05E-02	0	1.09E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0015	0.26	3.81E-04	1.426	2.12E-03	0.69	1.03E-03	0	1.15E-04	32.2	71.9	161	3.59E-06	1.60E-06	7.17E-07
1,2-Dichlorobenzene	0.0015	1.00	1.48E-03	2.452	3.64E-03	0.59	8.74E-04	0	2.95E-04	32.2	71.9	161	9.18E-06	4.10E-06	1.84E-06
1,3-Dichlorobenzene	0.0015	1.00	1.48E-03	2.296	3.41E-03	0.11	1.56E-04	0	2.95E-04	32.2	71.9	161	9.18E-06	4.10E-06	1.84E-06
1,4-Dichlorobenzene	0.0015	1.00	1.48E-03	2.475	3.67E-03	0.07	1.09E-04	0	2.95E-04	32.2	71.9	161	9.18E-06	4.10E-06	1.84E-06
4-Bromophenyl-phenylether	0.1083	1.00	1.08E-01	0.566	6.13E-02	1.00	1.08E-01	0	2.16E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.1083	1.00	1.08E-01	0.593	6.42E-02	1.00	1.08E-01	0	2.16E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.1083	0.51	5.55E-02	0.246	2.67E-02	0.47	5.13E-02	0	1.29E-02	0.113	0.253	0.565	1.14E-01	5.12E-02	2.29E-02
Hexachlorobutadiene	0.1083	0.39	4.17E-02	0.675	7.32E-02	0.19	2.05E-02	0	1.07E-02	3.39	7.58	17.0	3.15E-03	1.41E-03	6.30E-04
Hexachlorocyclopentadiene	0.1083	1.00	1.08E-01	0.393	4.26E-02	1.00	1.08E-01	0	2.16E-02	NA	NA	NA	NA	NA	NA
Hexachloroethane	0.1083	1.00	1.08E-01	1.439	1.56E-01	1.00	1.08E-01	0	2.16E-02	NA	NA	NA	NA	NA	NA
Pentachlorophenol	0.3580	1.00	3.58E-01	5.930	2.12E+00	2.16	7.73E-01	0	7.12E-02	6.73	21.3	67.3	1.06E-02	3.35E-03	1.06E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0080 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.820 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.180 = Proportion of diet composed of sediment
WIR = 0.0069 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0404 = Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

Attachment Table 2-15
Summary of White-cheeked Pintail Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
Former NASD, Vieques, Puerto Rico

Chemical	Mean Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0233	2.36	5.50E-02	Regression	4.80E-03	3.9	9.06E-02	0	7.68E-04	0.12	0.27	0.60	6.40E-03	2.86E-03	1.28E-03
4,4'-DDE	0.0094	2.36	2.21E-02	Regression	2.41E-03	6.4	5.99E-02	0	3.48E-04	0.12	0.27	0.60	2.90E-03	1.30E-03	5.80E-04
4,4'-DDT	0.0077	0.31	2.38E-03	Regression	2.07E-03	4.2	3.21E-02	0	2.03E-04	0.60	0.95	1.50	3.38E-04	2.14E-04	1.35E-04
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0015	1.00	1.48E-03	1.000	1.48E-03	1.00	1.48E-03	0	1.32E-04	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	0.1083	0.40	4.30E-02	0.792	8.58E-02	0.19	2.05E-02	0	7.46E-03	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0015	0.26	3.81E-04	1.426	2.12E-03	0.69	1.03E-03	0	1.77E-04	32.2	71.9	161	5.49E-06	2.46E-06	1.10E-06
1,2-Dichlorobenzene	0.0015	1.00	1.48E-03	2.452	3.64E-03	0.59	8.74E-04	0	3.05E-04	32.2	71.9	161	9.49E-06	4.24E-06	1.90E-06
1,3-Dichlorobenzene	0.0015	1.00	1.48E-03	2.296	3.41E-03	0.11	1.56E-04	0	2.87E-04	32.2	71.9	161	8.92E-06	3.99E-06	1.78E-06
1,4-Dichlorobenzene	0.0015	1.00	1.48E-03	2.475	3.67E-03	0.07	1.09E-04	0	3.08E-04	32.2	71.9	161	9.58E-06	4.28E-06	1.92E-06
4-Bromophenyl-phenylether	0.1083	1.00	1.08E-01	0.566	6.13E-02	1.00	1.08E-01	0	5.86E-03	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.1083	1.00	1.08E-01	0.593	6.42E-02	1.00	1.08E-01	0	6.10E-03	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.1083	0.51	5.55E-02	0.246	2.67E-02	0.47	5.13E-02	0	2.78E-03	0.113	0.253	0.565	2.46E-02	1.10E-02	4.92E-03
Hexachlorobutadiene	0.1083	0.39	4.17E-02	0.675	7.32E-02	0.19	2.05E-02	0	6.44E-03	3.39	7.58	17.0	1.90E-03	8.50E-04	3.80E-04
Hexachlorocyclopentadiene	0.1083	1.00	1.08E-01	0.393	4.26E-02	1.00	1.08E-01	0	4.36E-03	NA	NA	NA	NA	NA	NA
Hexachloroethane	0.1083	1.00	1.08E-01	1.439	1.56E-01	1.00	1.08E-01	0	1.35E-02	NA	NA	NA	NA	NA	NA
Pentachlorophenol	0.3580	1.00	3.58E-01	5.930	2.12E+00	2.16	7.73E-01	0	1.74E-01	6.73	21.3	67.3	2.58E-02	8.17E-03	2.58E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0462 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.064 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.903 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.033 = Proportion of diet composed of sediment
WIR = 0.0380 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.519 = Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

Attachment Table 2-16
Summary of Cave Swallow Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
Former NASD, Vieques, Puerto Rico

Chemical	Mean Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0233	2.36	5.50E-02	Regression	4.80E-03	3.9	9.06E-02	0	1.32E-02	0.50	1.58	5.00	2.63E-02	8.32E-03	2.63E-03
4,4'-DDE	0.0094	2.36	2.21E-02	Regression	2.41E-03	6.4	5.99E-02	0	5.29E-03	0.50	1.58	5.00	1.06E-02	3.34E-03	1.06E-03
4,4'-DDT	0.0077	0.31	2.38E-03	Regression	2.07E-03	4.2	3.21E-02	0	5.69E-04	0.50	1.58	5.00	1.14E-03	3.60E-04	1.14E-04
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0015	1.00	1.48E-03	1.000	1.48E-03	1.00	1.48E-03	0	3.55E-04	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	0.1083	0.40	4.30E-02	0.792	8.58E-02	0.19	2.05E-02	0	1.03E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0015	0.26	3.81E-04	1.426	2.12E-03	0.69	1.03E-03	0	9.12E-05	32.2	71.9	161	2.84E-06	1.27E-06	5.67E-07
1,2-Dichlorobenzene	0.0015	1.00	1.48E-03	2.452	3.64E-03	0.59	8.74E-04	0	3.55E-04	32.2	71.9	161	1.10E-05	4.93E-06	2.21E-06
1,3-Dichlorobenzene	0.0015	1.00	1.48E-03	2.296	3.41E-03	0.11	1.56E-04	0	3.55E-04	32.2	71.9	161	1.10E-05	4.93E-06	2.21E-06
1,4-Dichlorobenzene	0.0015	1.00	1.48E-03	2.475	3.67E-03	0.07	1.09E-04	0	3.55E-04	32.2	71.9	161	1.10E-05	4.93E-06	2.21E-06
4-Bromophenyl-phenylether	0.1083	1.00	1.08E-01	0.566	6.13E-02	1.00	1.08E-01	0	2.59E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.1083	1.00	1.08E-01	0.593	6.42E-02	1.00	1.08E-01	0	2.59E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.1083	0.51	5.55E-02	0.246	2.67E-02	0.47	5.13E-02	0	1.33E-02	0.113	0.253	0.565	1.17E-01	5.25E-02	2.35E-02
Hexachlorobutadiene	0.1083	0.39	4.17E-02	0.675	7.32E-02	0.19	2.05E-02	0	9.98E-03	3.39	7.58	17.0	2.94E-03	1.32E-03	5.89E-04
Hexachlorocyclopentadiene	0.1083	1.00	1.08E-01	0.393	4.26E-02	1.00	1.08E-01	0	2.59E-02	NA	NA	NA	NA	NA	NA
Hexachloroethane	0.1083	1.00	1.08E-01	1.439	1.56E-01	1.00	1.08E-01	0	2.59E-02	NA	NA	NA	NA	NA	NA
Pentachlorophenol	0.3580	1.00	3.58E-01	5.930	2.12E+00	2.16	7.73E-01	0	8.56E-02	6.73	21.3	67.3	1.27E-02	4.02E-03	1.27E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0038 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0037 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0158 = Body weight (kg)

Attachment Table 2-17
Summary of Fishing Bat Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
Former NASD, Vieques, Puerto Rico

Chemical	Mean Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0233	2.36	5.50E-02	Regression	4.80E-03	3.9	9.06E-02	0	8.88E-03	0.147	0.329	0.735	6.04E-02	2.70E-02	1.21E-02
4,4'-DDE	0.0094	2.36	2.21E-02	Regression	2.41E-03	6.4	5.99E-02	0	5.87E-03	0.147	0.329	0.735	4.00E-02	1.79E-02	7.99E-03
4,4'-DDT	0.0077	0.31	2.38E-03	Regression	2.07E-03	4.2	3.21E-02	0	3.14E-03	0.147	0.329	0.735	2.14E-02	9.57E-03	4.28E-03
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0015	1.00	1.48E-03	1.000	1.48E-03	1.00	1.48E-03	0	1.45E-04	76.0	170	380	1.91E-06	8.56E-07	3.83E-07
1,2,4,5-Tetrachlorobenzene	0.1083	0.40	4.30E-02	0.792	8.58E-02	0.19	2.05E-02	0	2.01E-03	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0015	0.26	3.81E-04	1.426	2.12E-03	0.69	1.03E-03	0	1.01E-04	53.0	75.0	106	1.91E-06	1.35E-06	9.53E-07
1,2-Dichlorobenzene	0.0015	1.00	1.48E-03	2.452	3.64E-03	0.59	8.74E-04	0	8.57E-05	85.7	192	429	1.00E-06	4.47E-07	2.00E-07
1,3-Dichlorobenzene	0.0015	1.00	1.48E-03	2.296	3.41E-03	0.11	1.56E-04	0	1.53E-05	85.7	192	429	1.79E-07	7.99E-08	3.57E-08
1,4-Dichlorobenzene	0.0015	1.00	1.48E-03	2.475	3.67E-03	0.07	1.09E-04	0	1.07E-05	30.0	52.0	90.0	3.57E-07	2.06E-07	1.19E-07
4-Bromophenyl-phenylether	0.1083	1.00	1.08E-01	0.566	6.13E-02	1.00	1.08E-01	0	1.06E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.1083	1.00	1.08E-01	0.593	6.42E-02	1.00	1.08E-01	0	1.06E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.1083	0.51	5.55E-02	0.246	2.67E-02	0.47	5.13E-02	0	5.03E-03	2.00	2.83	4.00	2.51E-03	1.78E-03	1.26E-03
Hexachlorobutadiene	0.1083	0.39	4.17E-02	0.675	7.32E-02	0.19	2.05E-02	0	2.01E-03	2.00	6.32	20.0	1.01E-03	3.18E-04	1.01E-04
Hexachlorocyclopentadiene	0.1083	1.00	1.08E-01	0.393	4.26E-02	1.00	1.08E-01	0	1.06E-02	75.0	168	375	1.42E-04	6.33E-05	2.83E-05
Hexachloroethane	0.1083	1.00	1.08E-01	1.439	1.56E-01	1.00	1.08E-01	0	1.06E-02	100	224	500	1.06E-04	4.75E-05	2.12E-05
Pentachlorophenol	0.3580	1.00	3.58E-01	5.930	2.12E+00	2.16	7.73E-01	0	7.57E-02	8.42	18.8	42.1	8.99E-03	4.02E-03	1.80E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0053 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0072 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0544 = Body weight (kg)

Attachment Table 2-18
Summary of Velvet Free-Tailed. Bat Exposure Doses - Baseline (Step 3A) - Arithmetic Mean
Former NASD, Vieques, Puerto Rico

Chemical	Mean Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Mean Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Pesticides															
4,4'-DDD	0.0233	2.36	5.50E-02	Regression	4.80E-03	3.9	9.06E-02	0	9.38E-03	0.147	0.329	0.735	6.38E-02	2.85E-02	1.28E-02
4,4'-DDE	0.0094	2.36	2.21E-02	Regression	2.41E-03	6.4	5.99E-02	0	3.77E-03	0.147	0.329	0.735	2.56E-02	1.15E-02	5.13E-03
4,4'-DDT	0.0077	0.31	2.38E-03	Regression	2.07E-03	4.2	3.21E-02	0	4.06E-04	0.147	0.329	0.735	2.76E-03	1.24E-03	5.52E-04
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	0.0015	1.00	1.48E-03	1.000	1.48E-03	1.00	1.48E-03	0	2.53E-04	76.0	170	380	3.33E-06	1.49E-06	6.66E-07
1,2,4,5-Tetrachlorobenzene	0.1083	0.40	4.30E-02	0.792	8.58E-02	0.19	2.05E-02	0	7.34E-03	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	0.0015	0.26	3.81E-04	1.426	2.12E-03	0.69	1.03E-03	0	6.50E-05	53.0	75.0	106	1.23E-06	8.67E-07	6.13E-07
1,2-Dichlorobenzene	0.0015	1.00	1.48E-03	2.452	3.64E-03	0.59	8.74E-04	0	2.53E-04	85.7	192	429	2.95E-06	1.32E-06	5.90E-07
1,3-Dichlorobenzene	0.0015	1.00	1.48E-03	2.296	3.41E-03	0.11	1.56E-04	0	2.53E-04	85.7	192	429	2.95E-06	1.32E-06	5.90E-07
1,4-Dichlorobenzene	0.0015	1.00	1.48E-03	2.475	3.67E-03	0.07	1.09E-04	0	2.53E-04	30.0	52.0	90.0	8.43E-06	4.87E-06	2.81E-06
4-Bromophenyl-phenylether	0.1083	1.00	1.08E-01	0.566	6.13E-02	1.00	1.08E-01	0	1.85E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	0.1083	1.00	1.08E-01	0.593	6.42E-02	1.00	1.08E-01	0	1.85E-02	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.1083	0.51	5.55E-02	0.246	2.67E-02	0.47	5.13E-02	0	9.46E-03	2.00	2.83	4.00	4.73E-03	3.34E-03	2.37E-03
Hexachlorobutadiene	0.1083	0.39	4.17E-02	0.675	7.32E-02	0.19	2.05E-02	0	7.11E-03	2.00	6.32	20.0	3.56E-03	1.12E-03	3.56E-04
Hexachlorocyclopentadiene	0.1083	1.00	1.08E-01	0.393	4.26E-02	1.00	1.08E-01	0	1.85E-02	75.0	168	375	2.46E-04	1.10E-04	4.93E-05
Hexachloroethane	0.1083	1.00	1.08E-01	1.439	1.56E-01	1.00	1.08E-01	0	1.85E-02	100	224	500	1.85E-04	8.26E-05	3.70E-05
Pentachlorophenol	0.3580	1.00	3.58E-01	5.930	2.12E+00	2.16	7.73E-01	0	6.11E-02	8.42	18.8	42.1	7.25E-03	3.24E-03	1.45E-03

Concentration based on detection limits; chemical not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0017 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0016 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0101 = Body weight (kg)

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	4.56	4.56	4.56
Percent soilds:	0.21	0.21	0.25

Appendix E
Data Validation Reports

DataQual

Environmental Services, LLC

CH2M HILL
15010 Conference Center Drive
Suite 200
Chantilly, VA 20151

July 16, 2013
SDG# A302428, ENCO
Vieques East, Puerto Rico- Laguna La Chiva SWMU 1

Dear Mr. Zamboni,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # A302428. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8260B-Rev 2, August 2008-SOP#HW-24, 8270D-Rev 3, October 2006-SOP #HW-22, 8081B-Rev. 1.0, October 2006-SOP HW-44) and professional judgment. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	VOA	SVOA	Pest
VENO-SS01-0002	A302428-01	soil			X
VENO-SS01P-0002	A302428-02	soil			X
VENO-SS04-0001	A302428-03	soil			X
VENO-SS05-0002	A302428-04	soil			X
VENO-SS07-0002	A302428-05	soil			X
VENO-EB01-051413-SS	A302428-06	water			X
VENO-SD01-000H	A302428-07	soil	X	X	X
VENO-SD01P-000H	A302428-08	soil	X	X	X
VENO-SD01-0H01	A302428-09	soil	X	X	X
VENO-SD02-000H	A302428-10	soil	X	X	X
VENO-SD03-000H	A302428-11	soil	X	X	X
VENO-SD12-000H	A302428-12	soil	X	X	X
VENO-SD02-0H01	A302428-13	soil	X	X	X
VENO-EB01-051513-SD	A302428-14	water	X	X	X
VENO-TB01-051513-SD	A302428-15	water	X		
VENO-SD02-000H MS	A302428-10MS	soil	X	X	X
VENO-SD02-000H MSD	A302428-10MSD	soil	X	X	X

The following quality control samples were provided with this SDG: sample VENO-EB01-051513-SD & VENO-EB01-051413-SS-equipment blanks, sample VENO-TB01-051513-SD- trip blank, sample VENO-SD01P-000H- field duplicate of sample VENO-SD01-000H, and sample VENO-SS01P-0002-field duplicate of sample VENO-SS01-0002.

5830 Amberway Drive • St. Louis, MO 63128 • 314-330-1327 • Fax 314-849-6264

The samples were evaluated based on the following criteria:

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

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

Overall Evaluation of Data/Potential Usability Issues

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

All Fractions

The results for three soil samples were qualified as estimated in all fractions due to high percent moisture content.

VOA

The initial calibration exhibited a low RRF values which resulted in qualifying the associated sample positive results as estimated and non-detect results as rejected.

Due to non-compliant surrogate recoveries qualifications were added to one sample.

The matrix spike and matrix spike duplicate exhibited non-compliant recoveries that resulted in qualifications to the associated sample.

The field duplicate pair exhibited non-compliant reproducibility, therefore qualifications were added to the samples.

SVOA

The initial and continuing calibrations exhibited a high %RSD and %D values which resulted in qualifying the associated sample results as estimated.

Due to non-compliant surrogate recoveries qualifications were added to four samples.

Pesticides

One sample was re-extracted five days outside the fourteen day extraction holding time. The sample was re-extracted due to non-compliant surrogate recoveries and the matrix effect was confirmed. Therefore, the RE sample was excluded in favor of the results from the original extraction analysis with a qualifier code of RE.

Qualifications were required due to non-compliant surrogate recoveries.

One compound exhibited a high %D (>20%) due to a decrease in instrument sensitivity. Therefore the compound was qualified as estimated in the samples.

One compound in the MS/MSD of the SD sample matrix exhibited a low recovery for DDE in both spike aliquots. Therefore, the compound was qualified as estimated J/UJ in the native sample only.

One of the field duplicate pairs exhibited non-compliant RPDs. Qualifications were required in the field duplicate pair.

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

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the pesticides fraction. Clarification and additional information was required regarding the calibrations in the pesticide fraction. Some of the reporting forms required modification and resubmission because they were incomplete. Also, an example quantitation calculation was requested. All requested items were received from the laboratory. A copy of the email correspondence is included in the validation worksheets section of this report.

Sample Condition

All Fractions

The following soil samples contained 50-90% water. All reported results in the samples in all fractions required qualification as estimated (J/UJ).

Sample ID	% Moisture
VENO-SD02-000H	53.08
VENO-SD03-000H	53.85
VENO-SD12-000H	60.87

Technical Holding Times

According to chain of custody records, sampling was performed on 5/14-15/13 and samples were received on 5/16/13. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the exception of the following.

Pesticides

The re-extraction of sample VENO-SD02-000H was completed 5 days outside the 14 day holding time. The reanalysis of the sample exhibited recoveries that were below the lower QC limits for one or both surrogate compounds which confirmed matrix issues, therefore results for this sample were excluded with the qualifier code: RE.

Initial/Continuing Calibration

VOA

Calibration standards exhibited RRF values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results were qualified as indicated.

Calibration File	Compound(s)	RRF, %RSD, %D	Samples	Q Flag	Q Code
IC 04/09/13	2-butanone	0.0439	VENO-TB01-051513-SD, VENO-EB01-051513-SD	J/R	ICL
	4-methyl-2-pentanone	0.0309			

SVOA

Calibration standards exhibited %RSD and %D values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results were qualified as indicated.

Calibration File	Compound(s)	RRF, %RSD, %D	Samples	Q Flag	Q Code
IC 04/24/13	2,4-dinitrophenol	37.65	all samples	J/UJ	ICH
	2-methyl-4,6-dinitrophenol	30.22			
CC 06/03/13	4-nitrophenol	42.2	VENO-SD02-000H, VENO-SD01-000H, VENO-SD01P-000H, VENO-SD01-0H01, VENO-SD03-000H, VENO-SD12-000H, VENO-SD02-0H01	J/UJ	CCH
	2,4-dinitrotoluene	21.4			
	4-nitroaniline	27.9			
	butylbenzylphthalate	21.4			
CC 06/05/13	4-nitroaniline	24.0	VENO-EB01-051513-SD	J/UJ	CCH

Pesticides

Calibration standards exhibited a %D value that was non-compliant. A summary of this non-compliance and affected samples is noted in the following table. Sample results were qualified as indicated.

Calibration ID	Compound	%D	Samples	Q Flag	Q Code
2F4003.D, 6/4/13 @ 1028	4,4'-DDT	-20.4	all samples	J/UJ	CCL

Surrogates

VOA

The following samples exhibited non-compliant recoveries for the surrogate listed in the table below; qualifications were applied as noted. The sample was not re-analyzed by the laboratory.

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VENO-SD02-0H01	4-bromofluorobenzene	83	85-120	J/UJ	SSL

SVOA

The following samples exhibited non-compliant recoveries for the surrogate listed in the table below; qualifications were applied as noted. None of the samples listed below were re-analyzed (see e-mail from lab in SVOA worksheets).

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VENO-SD02-000H	nitrobenzene-d5	32	35-100	J/UJ B/N fraction compounds	SSL
	2-fluorobiphenyl	26	45-105		
VENO-SD01P-000H	nitrobenzene-d5	34	35-100	J/UJ B/N fraction compounds	SSL
	2-fluorobiphenyl	25	45-105		
VENO-SD01-0H01	2-fluorophenol	31	35-105	J/UJ	SSL
	phenol-d5	36	40-100		
	nitrobenzene-d5	29	35-100		
	2-fluorobiphenyl	23	45-105		
VENO-SD12-000H	2-fluorophenol	32	35-105	J/UJ	SSL
	phenol-d5	35	40-100		
	nitrobenzene-d5	27	35-100		
	2-fluorobiphenyl	21	45-105		
	2,4,6-tribromophenol	29	35-125		
VENO-SD02-0H01	2-fluorophenol	31	35-105	J/UJ	SSL
	phenol-d5	35	40-100		
	nitrobenzene-d5	30	35-100		
	2-fluorobiphenyl	29	45-105		

Pesticides

The following samples exhibited non-compliant recoveries for the surrogates listed in the table below; qualifications were applied as noted.

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VENO-SD02-000H	2,4,5,6-tetrachloro-m-xylene	66/61	70-125	J/UJ	SSL
VENO-SS01P-0002	2,4,5,6-tetrachloro-m-xylene	68/62	70-125		
VENO-SS04-0001	2,4,5,6-tetrachloro-m-xylene	64/59	70-125		
VENO-SD01P-000H	2,4,5,6-tetrachloro-m-xylene	66/62	70-125		
VENO-SD01-0H01	2,4,5,6-tetrachloro-m-xylene	60/54	70-125		
VENO-SD03-000H	2,4,5,6-tetrachloro-m-xylene	53/49	70-125		
VENO-SD12-000H	2,4,5,6-tetrachloro-m-xylene	51/49	70-125		
VENO-SD02-0H01	2,4,5,6-tetrachloro-m-xylene	53/48	70-125		

Matrix Spike

VOA

The matrix spike and matrix spike duplicate associated with sample VENO-SD02-000H exhibited non-compliant recoveries for the compounds listed in the table below; qualifications were applied as noted.

Sample ID	Compound	MS % Rec	MSD % Rec	QC Limits	Qualifier	Q Code
VENO-SD02-000H	bromodichloromethane	65	62	70-130	J/UJ	MSL
	cis-1,3-dichloropropene	50	47	70-125		
	trans-1,3-dichloropropene	53	50	65-125		
	dibromochloromethane	51	47	65-130		
	1,2-dibromoethane	60	62	70-125		
	chlorobenzene	46	52	75-125		
	ethylbenzene	46	51	75-125		
	m,p-xylenes	43	50	80-125		
	o-xylenes	41	47	75-125		
	bromoform	48	41	55-135		
	styrene	30	34	75-125		
	isopropylbenzene	39	47	75-130		
	1,2,4-trichlorobenzene	20	23	65-130		
	1,3-dichlorobenzene	28	34	70-125		
	1,4-dichlorobenzene	29	32	70-125		
	1,2-dichlorobenzene	28	33	75-120		
	1,2,3-trichlorobenzene	20	21	60-135		

Matrix Spike Recoveries

Pesticides

The MS/MSD pair of sample VENO-SD02-000H exhibited low recoveries for the compound 4, 4'-DDE (69/68) in both spike aliquots. Therefore the compound was qualified as estimated J/UJ with a qualifier code of MSL in the native sample only.

Field Duplicate

VOA

Sample VENO-SD01-000H and duplicate sample VENO-SD01P-000H exhibited non-compliant field duplicate reproducibility for 2-butanone with 200% RPD; therefore the results for this compound were qualified as estimated (J/UJ), qualifier code: FD.

Pesticides

Sample VENO-SD01-000H and duplicate sample VENO-SD01P-000H exhibited non-compliant field duplicate RPDs for 4,4'-DDE (37%), 4,4'-DDD (56%) and 4,4'-DDT (93%). Therefore the results for these compounds were qualified as estimated J in the field duplicate pair with a qualifier code of FD.

Identification/Quantitation

SVOA

Sample VENO-SD01-000H was re-analyzed due to a low surrogate recovery. The re-analysis was excluded in favor of the initial analysis as similar results were exhibited and the re-analysis was extracted out of holding time.

Pesticides

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

Sample ID	Compound	Column Quant %D	Qualifier	Q Code
VENO-SS05-0002	4,4'-DDD	200	U at LOD	2C
VENO-SD12-000H	4,4'-DDD	43.1	J	2C

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

Sincerely,

Jacqueline Cleveland

Jacqueline Cleveland
Vice-President

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag	Q Code
VENO-SD02-000H, VENO-SD03-000H, VENO-SD12-000H	all results	+/-	J/UJ	%SOL
VENO-TB01-051513-SD, VENO-EB01-051513-SD	2-butanone 4-methyl-2-pentanone	+/-	J/R	ICL
VENO-SD02-0H01	all results	+/-	J/UJ	SSL
VENO-SD02-000H^	bromodichloromethane cis-1,3-dichloropropene trans-1,3-dichloropropene dibromochloromethane 1,2-dibromoethane chlorobenzene ethylbenzene m,p-xylenes o-xylenes bromoform styrene isopropylbenzene 1,2,4-trichlorobenzene 1,3-dichlorobenzene 1,4-dichlorobenzene 1,2-dichlorobenzene 1,2,3-trichlorobenzene	+/-	J/UJ	MSL
VENO-SD01-000H, VENO-SD01P-000H	2-butanone	+/-	J/UJ	FD

^final qualifier due to high percent moisture

SVOA

Sample ID	Compound	Results	Q flag	Q Code
VENO-SD02-000H, VENO-SD03-000H, VENO-SD12-000H^	all results	+/-	J/UJ	%SOL
all samples	2,4-dinitrophenol 2-methyl-4,6-dinitrophenol	+/-	J/UJ	ICH
VENO-SD02-000H*, VENO-SD01-000H, VENO-SD01P-000H, VENO-SD01-0H01^, VENO-SD03-000H*, VENO-SD12-000H^, VENO-SD02-0H01^	4-nitrophenol 2,4-dinitrotoluene 4-nitroaniline butylbenzylphthalate	+/-	J/UJ	CCH
VENO-EB01-051513-SD	4-nitroaniline	+/-	J/UJ	CCH
VENO-SD02-000H*, VENO-SD01P-000H	all base/neutral fraction compounds	+/-	J/UJ	SSL
VENO-SD01-0H01, VENO-SD12-000H, VENO-SD02-0H01	all results	+/-	J/UJ	SSL
VENO-SD01-000HRE	all results	+/-	exclude	RE

^final qualifier due to non-compliant surrogate recoveries
**final qualifier due to high percent moisture*

Summary of Data Qualifications

Pesticides

Sample ID	Compound	Results	Q flag	Q Code
VENO-SD02-000H, VENO-SD03-000H, VENO-SD12-000H	all results	+/-	J/UJ	%SOL
VENO-SD02-000HRE1	all compounds	+/-	exclude	RE
all samples	4,4'-DDT	+/-	J/UJ	CCL
VENO-SD02-000H, VENO-SS01P-0002, VENO-SS04-0001, VENO-SD01P-000H, VENO-SD01-0H01, VENO-SD03-000H, VENO-SD12-000H, VENO-SD02-0H01	all compounds	+/-	J/UJ	SSL*
VENO-SD02-000H	4,4'-DDE	+/-	J/UJ	MSL
VENO-SD01-000H, VENO-SD01P-000H	all compounds	+	J	FD
VENO-SS05-0002	4,4'-DDD	+	U at LOD	2C
VENO-SD12-000H	4,4'-DDD	+	J	2C

*Please note-SSL is the final qualifier for the samples listed on this line.

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

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

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

Organic Methods

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

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the ICB/CCB/PB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the LOD.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the LOD.
J/UJ -	Sample result is less than 10X LOD when blank result is below the negative LOD.

Glossary of Qualification Flags and Abbreviations, continued

Field QC Blank action:

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

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

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the FB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the FB value when the FB value is greater than the LOD.
J -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the LOD.

General Abbreviations

RL	reporting limit
MDL	method detection limit
IDL	instrument detection limit
LOD	Level of Detection
LOD	Level of Quantitation
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

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

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD01-000H

Laboratory: ENCO Orlando SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Matrix: Sediment Laboratory ID: A302428-07 File ID: 2EP008.D

Sampled: 05/15/13 10:30 Prepared: 05/21/13 12:35 Analyzed: 05/21/13 17:59

Solids: 54.93 Preparation: EPA 5030B_MS Initial/Final: 4.92 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0018	U	0.0011	0.0018	0.0036
74-87-3	Chloromethane	1	<0.0018	U	0.0012	0.0018	0.0036
75-01-4	Vinyl chloride	1	<0.0018	U	0.0008	0.0018	0.0036
74-83-9	Bromomethane	1	<0.0091	U	0.0016	0.0091	0.018
75-00-3	Chloroethane	1	<0.0018	U	0.0010	0.0018	0.0036
75-69-4	Trichlorofluoromethane	1	<0.0018	U	0.0010	0.0018	0.0036
76-13-1	Freon 113	1	<0.0018	U	0.0011	0.0018	0.0036
67-64-1	Acetone	1	0.012	J	0.0031	0.023	0.046
75-35-4	1,1-Dichloroethene	1	<0.0018	U	0.0011	0.0018	0.0036
75-15-0	Carbon disulfide	1	<0.0091	U	0.0038	0.0091	0.018
75-09-2	Methylene Chloride	1	<0.0091	U	0.0013	0.0091	0.018
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0018	U	0.0005	0.0018	0.0036
156-60-5	trans-1,2-Dichloroethene	1	<0.0018	U	0.0013	0.0018	0.0036
156-59-2	cis-1,2-Dichloroethene	1	<0.0018	U	0.0010	0.0018	0.0036
75-34-3	1,1-Dichloroethane	1	<0.0018	U	0.0010	0.0018	0.0036
78-93-3	2-Butanone	1	<0.0046	U	0.0033	0.0046	0.0091
67-66-3	Chloroform	1	<0.0018	U	0.0008	0.0018	0.0036
74-97-5	Bromochloromethane	1	<0.0018	U	0.0006	0.0018	0.0036
71-55-6	1,1,1-Trichloroethane	1	<0.0018	U	0.0006	0.0018	0.0036
79-20-9	Methyl acetate	1	<0.0091	U	0.0029	0.0091	0.018
110-82-7	Cyclohexane	1	<0.0018	U	0.0010	0.0018	0.0036
108-87-2	Methyl cyclohexane	1	<0.0018	U	0.0009	0.0018	0.0036
56-23-5	Carbon Tetrachloride	1	<0.0018	U	0.0011	0.0018	0.0036
107-06-2	1,2-Dichloroethane	1	<0.0018	U	0.0006	0.0018	0.0036
71-43-2	Benzene	1	<0.0018	U	0.0007	0.0018	0.0036
79-01-6	Trichloroethene	1	<0.0018	U	0.0009	0.0018	0.0036
78-87-5	1,2-Dichloropropane	1	<0.0018	U	0.0010	0.0018	0.0036
75-27-4	Bromodichloromethane	1	<0.0018	U	0.0006	0.0018	0.0036
108-10-1	4-Methyl-2-pentanone	1	<0.0046	U	0.0025	0.0046	0.0091
591-78-6	2-Hexanone	1	<0.0046	U	0.0017	0.0046	0.0091
10061-01-5	cis-1,3-Dichloropropene	1	<0.0018	U	0.0005	0.0018	0.0036
108-88-3	Toluene	1	<0.0018	U	0.0008	0.0018	0.0036
10061-02-6	trans-1,3-Dichloropropene	1	<0.0018	U	0.0006	0.0018	0.0036
79-00-5	1,1,2-Trichloroethane	1	<0.0018	U	0.0011	0.0018	0.0036

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ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD01-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-07	File ID:	2EP008.D
Sampled:	05/15/13 10:30	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 17:59
Solids:	54.93	Preparation:	EPA 5030B_MS	Initial/Final:	4.92 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0018	U	0.0009	0.0018	0.0036
124-48-1	Dibromochloromethane	1	<0.0018	U	0.0005	0.0018	0.0036
106-93-4	1,2-Dibromoethane	1	<0.0018	U	0.0006	0.0018	0.0036
108-90-7	Chlorobenzene	1	<0.0018	U	0.0009	0.0018	0.0036
100-41-4	Ethylbenzene	1	<0.0018	U	0.0010	0.0018	0.0036
108-38-3/106-42-3	m,p-Xylenes	1	<0.0036	U	0.0018	0.0036	0.0073
95-47-6	o-Xylene	1	<0.0018	U	0.0009	0.0018	0.0036
75-25-2	Bromoform	1	<0.0018	U	0.0005	0.0018	0.0036
100-42-5	Styrene	1	<0.0018	U	0.0008	0.0018	0.0036
98-82-8	Isopropylbenzene	1	<0.0018	U	0.0010	0.0018	0.0036
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0018	U	0.0005	0.0018	0.0036
120-82-1	1,2,4-Trichlorobenzene	1	<0.0018	U	0.0015	0.0018	0.0036
541-73-1	1,3-Dichlorobenzene	1	<0.0018	U	0.0009	0.0018	0.0036
106-46-7	1,4-Dichlorobenzene	1	<0.0018	U	0.0008	0.0018	0.0036
95-50-1	1,2-Dichlorobenzene	1	<0.0018	U	0.0008	0.0018	0.0036
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0018	U	0.0010	0.0018	0.0036
87-61-6	1,2,3-Trichlorobenzene	1	<0.0018	U	0.0017	0.0018	0.0036

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.0925	0.080	86	74 - 133	
Toluene-d8	0.0925	0.090	97	85 - 115	
4-Bromofluorobenzene	0.0925	0.082	88	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1196865	11.32	1249106	11.31	
1,4-Difluorobenzene	1829929	11.89	1940286	11.88	
Chlorobenzene-d5	1576334	14.55	1665139	14.55	
1,4-Dichlorobenzene-d4	719330	16.89	841846	16.89	

* Values outside of QC limits

LM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD01P-000H

Laboratory: ENCO Orlando SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Matrix: Sediment Laboratory ID: A302428-08 File ID: 2EP009.D

Sampled: 05/15/13 10:30 Prepared: 05/21/13 12:35 Analyzed: 05/21/13 18:31

Solids: 55.28 Preparation: EPA 5030B_MS Initial/Final: 4.82 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0018	U	0.0011	0.0018	0.0036
74-87-3	Chloromethane	1	<0.0018	U	0.0012	0.0018	0.0036
75-01-4	Vinyl chloride	1	<0.0018	U	0.0008	0.0018	0.0036
74-83-9	Bromomethane	1	<0.0090	U	0.0016	0.0090	0.018
75-00-3	Chloroethane	1	<0.0018	U	0.0010	0.0018	0.0036
75-69-4	Trichlorofluoromethane	1	<0.0018	U	0.0010	0.0018	0.0036
76-13-1	Freon 113	1	<0.0018	U	0.0011	0.0018	0.0036
67-64-1	Acetone	1	0.022	J	0.0031	0.023	0.045
75-35-4	1,1-Dichloroethene	1	<0.0018	U	0.0011	0.0018	0.0036
75-15-0	Carbon disulfide	1	<0.0090	U	0.0038	0.0090	0.018
75-09-2	Methylene Chloride	1	<0.0090	U	0.0012	0.0090	0.018
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0018	U	0.0005	0.0018	0.0036
156-60-5	trans-1,2-Dichloroethene	1	<0.0018	U	0.0012	0.0018	0.0036
156-59-2	cis-1,2-Dichloroethene	1	<0.0018	U	0.0010	0.0018	0.0036
75-34-3	1,1-Dichloroethane	1	<0.0018	U	0.0010	0.0018	0.0036
78-93-3	2-Butanone	1	0.0049	~~J~~	0.0033	0.0045	0.0090 FD
67-66-3	Chloroform	1	<0.0018	U	0.0008	0.0018	0.0036
74-97-5	Bromochloromethane	1	<0.0018	U	0.0006	0.0018	0.0036
71-55-6	1,1,1-Trichloroethane	1	<0.0018	U	0.0006	0.0018	0.0036
79-20-9	Methyl acetate	1	<0.0090	U	0.0029	0.0090	0.018
110-82-7	Cyclohexane	1	<0.0018	U	0.0010	0.0018	0.0036
108-87-2	Methyl cyclohexane	1	<0.0018	U	0.0009	0.0018	0.0036
56-23-5	Carbon Tetrachloride	1	<0.0018	U	0.0011	0.0018	0.0036
107-06-2	1,2-Dichloroethane	1	<0.0018	U	0.0006	0.0018	0.0036
71-43-2	Benzene	1	<0.0018	U	0.0007	0.0018	0.0036
79-01-6	Trichloroethene	1	<0.0018	U	0.0009	0.0018	0.0036
78-87-5	1,2-Dichloropropane	1	<0.0018	U	0.0010	0.0018	0.0036
75-27-4	Bromodichloromethane	1	<0.0018	U	0.0006	0.0018	0.0036
108-10-1	4-Methyl-2-pentanone	1	<0.0045	U	0.0025	0.0045	0.0090
591-78-6	2-Hexanone	1	<0.0045	U	0.0016	0.0045	0.0090
10061-01-5	cis-1,3-Dichloropropene	1	<0.0018	U	0.0005	0.0018	0.0036
108-88-3	Toluene	1	<0.0018	U	0.0008	0.0018	0.0036
10061-02-6	trans-1,3-Dichloropropene	1	<0.0018	U	0.0006	0.0018	0.0036
79-00-5	1,1,2-Trichloroethane	1	<0.0018	U	0.0011	0.0018	0.0036

MM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD01P-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-08	File ID:	2EP009.D
Sampled:	05/15/13 10:30	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 18:31
Solids:	55.28	Preparation:	EPA 5030B_MS	Initial/Final:	4.82 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0018	U	0.0009	0.0018	0.0036
124-48-1	Dibromochloromethane	1	<0.0018	U	0.0005	0.0018	0.0036
106-93-4	1,2-Dibromoethane	1	<0.0018	U	0.0006	0.0018	0.0036
108-90-7	Chlorobenzene	1	<0.0018	U	0.0009	0.0018	0.0036
100-41-4	Ethylbenzene	1	<0.0018	U	0.0010	0.0018	0.0036
108-38-3/106-42-3	m,p-Xylenes	1	<0.0036	U	0.0018	0.0036	0.0072
95-47-6	o-Xylene	1	<0.0018	U	0.0009	0.0018	0.0036
75-25-2	Bromoform	1	<0.0018	U	0.0005	0.0018	0.0036
100-42-5	Styrene	1	<0.0018	U	0.0008	0.0018	0.0036
98-82-8	Isopropylbenzene	1	<0.0018	U	0.0010	0.0018	0.0036
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0018	U	0.0005	0.0018	0.0036
120-82-1	1,2,4-Trichlorobenzene	1	<0.0018	U	0.0015	0.0018	0.0036
541-73-1	1,3-Dichlorobenzene	1	<0.0018	U	0.0009	0.0018	0.0036
106-46-7	1,4-Dichlorobenzene	1	<0.0018	U	0.0008	0.0018	0.0036
95-50-1	1,2-Dichlorobenzene	1	<0.0018	U	0.0008	0.0018	0.0036
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0018	U	0.0010	0.0018	0.0036
87-61-6	1,2,3-Trichlorobenzene	1	<0.0018	U	0.0016	0.0018	0.0036

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.0938	0.081	86	74 - 133	
Toluene-d8	0.0938	0.092	98	85 - 115	
4-Bromofluorobenzene	0.0938	0.083	89	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1142948	11.31	1249106	11.31	
1,4-Difluorobenzene	1766408	11.89	1940286	11.88	
Chlorobenzene-d5	1536347	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	698832	16.89	841846	16.89	

* Values outside of QC limits

LM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD01-0H01

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-09	File ID:	2EP010.D
Sampled:	05/15/13 10:45	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 19:03
Solids:	60.93	Preparation:	EPA 5030B MS	Initial/Final:	5.1 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0016	U	0.0010	0.0016	0.0033
74-87-3	Chloromethane	1	<0.0016	U	0.0011	0.0016	0.0033
75-01-4	Vinyl chloride	1	<0.0016	U	0.0007	0.0016	0.0033
74-83-9	Bromomethane	1	<0.0082	U	0.0015	0.0082	0.016
75-00-3	Chloroethane	1	<0.0016	U	0.0009	0.0016	0.0033
75-69-4	Trichlorofluoromethane	1	<0.0016	U	0.0009	0.0016	0.0033
76-13-1	Freon 113	1	<0.0016	U	0.0010	0.0016	0.0033
67-64-1	Acetone	1	0.026	J	0.0028	0.021	0.041
75-35-4	1,1-Dichloroethene	1	<0.0016	U	0.0010	0.0016	0.0033
75-15-0	Carbon disulfide	1	<0.0082	U	0.0034	0.0082	0.016
75-09-2	Methylene Chloride	1	<0.0082	U	0.0011	0.0082	0.016
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0016	U	0.0004	0.0016	0.0033
156-60-5	trans-1,2-Dichloroethene	1	<0.0016	U	0.0011	0.0016	0.0033
156-59-2	cis-1,2-Dichloroethene	1	<0.0016	U	0.0009	0.0016	0.0033
75-34-3	1,1-Dichloroethane	1	<0.0016	U	0.0009	0.0016	0.0033
78-93-3	2-Butanone	1	0.0053	J	0.0030	0.0041	0.0082
67-66-3	Chloroform	1	<0.0016	U	0.0007	0.0016	0.0033
74-97-5	Bromochloromethane	1	<0.0016	U	0.0006	0.0016	0.0033
71-55-6	1,1,1-Trichloroethane	1	<0.0016	U	0.0006	0.0016	0.0033
79-20-9	Methyl acetate	1	<0.0082	U	0.0026	0.0082	0.016
110-82-7	Cyclohexane	1	<0.0016	U	0.0009	0.0016	0.0033
108-87-2	Methyl cyclohexane	1	<0.0016	U	0.0009	0.0016	0.0033
56-23-5	Carbon Tetrachloride	1	<0.0016	U	0.0010	0.0016	0.0033
107-06-2	1,2-Dichloroethane	1	<0.0016	U	0.0005	0.0016	0.0033
71-43-2	Benzene	1	<0.0016	U	0.0007	0.0016	0.0033
79-01-6	Trichloroethene	1	<0.0016	U	0.0008	0.0016	0.0033
78-87-5	1,2-Dichloropropane	1	<0.0016	U	0.0009	0.0016	0.0033
75-27-4	Bromodichloromethane	1	<0.0016	U	0.0006	0.0016	0.0033
108-10-1	4-Methyl-2-pentanone	1	<0.0041	U	0.0023	0.0041	0.0082
591-78-6	2-Hexanone	1	<0.0041	U	0.0015	0.0041	0.0082
10061-01-5	cis-1,3-Dichloropropene	1	<0.0016	U	0.0005	0.0016	0.0033
108-88-3	Toluene	1	<0.0016	U	0.0008	0.0016	0.0033
10061-02-6	trans-1,3-Dichloropropene	1	<0.0016	U	0.0005	0.0016	0.0033
79-00-5	1,1,2-Trichloroethane	1	<0.0016	U	0.0010	0.0016	0.0033

070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD01-0H01

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-09	File ID:	2EP010.D
Sampled:	05/15/13 10:45	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 19:03
Solids:	60.93	Preparation:	EPA 5030B_MS	Initial/Final:	5.1 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0016	U	0.0008	0.0016	0.0033
124-48-1	Dibromochloromethane	1	<0.0016	U	0.0004	0.0016	0.0033
106-93-4	1,2-Dibromoethane	1	<0.0016	U	0.0005	0.0016	0.0033
108-90-7	Chlorobenzene	1	<0.0016	U	0.0008	0.0016	0.0033
100-41-4	Ethylbenzene	1	<0.0016	U	0.0009	0.0016	0.0033
108-38-3/106-42-3	m,p-Xylenes	1	<0.0033	U	0.0016	0.0033	0.0066
95-47-6	o-Xylene	1	<0.0016	U	0.0009	0.0016	0.0033
75-25-2	Bromoform	1	<0.0016	U	0.0005	0.0016	0.0033
100-42-5	Styrene	1	<0.0016	U	0.0007	0.0016	0.0033
98-82-8	Isopropylbenzene	1	<0.0016	U	0.0009	0.0016	0.0033
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0016	U	0.0005	0.0016	0.0033
120-82-1	1,2,4-Trichlorobenzene	1	<0.0016	U	0.0014	0.0016	0.0033
541-73-1	1,3-Dichlorobenzene	1	<0.0016	U	0.0008	0.0016	0.0033
106-46-7	1,4-Dichlorobenzene	1	<0.0016	U	0.0007	0.0016	0.0033
95-50-1	1,2-Dichlorobenzene	1	<0.0016	U	0.0007	0.0016	0.0033
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0016	U	0.0009	0.0016	0.0033
87-61-6	1,2,3-Trichlorobenzene	1	<0.0016	U	0.0015	0.0016	0.0033

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.0805	0.072	89	74 - 133	
Toluene-d8	0.0805	0.078	97	85 - 115	
4-Bromofluorobenzene	0.0805	0.070	87	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1166339	11.31	1249106	11.31	
1,4-Difluorobenzene	1804170	11.89	1940286	11.88	
Chlorobenzene-d5	1528481	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	687959	16.89	841846	16.89	

* Values outside of QC limits

MM 07/09/13

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD02-000H

Laboratory: ENCO Orlando SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Matrix: Sediment Laboratory ID: A302428-10 File ID: 2EP007.D

Sampled: 05/15/13 09:15 Prepared: 05/21/13 12:35 Analyzed: 05/21/13 17:28

Solids: 46.92 Preparation: EPA 5030B_MS Initial/Final: 4.2 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0025	U UJ	0.0016	0.0025	0.0051
74-87-3	Chloromethane	1	<0.0025	U	0.0016	0.0025	0.0051
75-01-4	Vinyl chloride	1	<0.0025	U	0.0011	0.0025	0.0051
74-83-9	Bromomethane	1	<0.013	U	0.0023	0.013	0.025
75-00-3	Chloroethane	1	<0.0025	U	0.0014	0.0025	0.0051
75-69-4	Trichlorofluoromethane	1	<0.0025	U	0.0014	0.0025	0.0051
76-13-1	Freon 113	1	<0.0025	U	0.0015	0.0025	0.0051
67-64-1	Acetone	1	0.14	J	0.0043	0.032	0.063
75-35-4	1,1-Dichloroethene	1	<0.0025	U UJ	0.0016	0.0025	0.0051
75-15-0	Carbon disulfide	1	<0.013	U	0.0053	0.013	0.025
75-09-2	Methylene Chloride	1	<0.013	U	0.0018	0.013	0.025
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0025	U	0.0007	0.0025	0.0051
156-60-5	trans-1,2-Dichloroethene	1	<0.0025	U	0.0018	0.0025	0.0051
156-59-2	cis-1,2-Dichloroethene	1	<0.0025	U	0.0013	0.0025	0.0051
75-34-3	1,1-Dichloroethane	1	<0.0025	U	0.0014	0.0025	0.0051
78-93-3	2-Butanone	1	0.048	J	0.0046	0.0063	0.013
67-66-3	Chloroform	1	<0.0025	U UJ	0.0011	0.0025	0.0051
74-97-5	Bromochloromethane	1	<0.0025	U	0.0009	0.0025	0.0051
71-55-6	1,1,1-Trichloroethane	1	<0.0025	U	0.0009	0.0025	0.0051
79-20-9	Methyl acetate	1	<0.013	UQ	0.0041	0.013	0.025
110-82-7	Cyclohexane	1	<0.0025	U	0.0013	0.0025	0.0051
108-87-2	Methyl cyclohexane	1	<0.0025	U	0.0013	0.0025	0.0051
56-23-5	Carbon Tetrachloride	1	<0.0025	U	0.0015	0.0025	0.0051
107-06-2	1,2-Dichloroethane	1	<0.0025	UQ	0.0008	0.0025	0.0051
71-43-2	Benzene	1	<0.0025	U	0.0010	0.0025	0.0051
79-01-6	Trichloroethene	1	<0.0025	U	0.0013	0.0025	0.0051
78-87-5	1,2-Dichloropropane	1	<0.0025	U	0.0014	0.0025	0.0051
75-27-4	Bromodichloromethane	1	<0.0025	UQ	0.0009	0.0025	0.0051
108-10-1	4-Methyl-2-pentanone	1	<0.0063	U	0.0036	0.0063	0.013
591-78-6	2-Hexanone	1	<0.0063	U	0.0023	0.0063	0.013
10061-01-5	cis-1,3-Dichloropropene	1	<0.0025	UQ	0.0008	0.0025	0.0051
108-88-3	Toluene	1	<0.0025	UQ	0.0012	0.0025	0.0051
10061-02-6	trans-1,3-Dichloropropene	1	<0.0025	UQ	0.0008	0.0025	0.0051
79-00-5	1,1,2-Trichloroethane	1	<0.0025	U	0.0015	0.0025	0.0051

%SOL

070913

020

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-10	File ID:	2EP007.D
Sampled:	05/15/13 09:15	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 17:28
Solids:	46.92	Preparation:	EPA 5030B_MS	Initial/Final:	4.2 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0025	UQ UJ	0.0012	0.0025	0.0051
124-48-1	Dibromochloromethane	1	<0.0025	UQ	0.0007	0.0025	0.0051
106-93-4	1,2-Dibromoethane	1	<0.0025	UQ	0.0008	0.0025	0.0051
108-90-7	Chlorobenzene	1	<0.0025	UQ	0.0012	0.0025	0.0051
100-41-4	Ethylbenzene	1	<0.0025	UQ	0.0014	0.0025	0.0051
108-38-3/106-42-3	m,p-Xylenes	1	<0.0051	UQ	0.0025	0.0051	0.010
95-47-6	o-Xylene	1	<0.0025	UQ	0.0013	0.0025	0.0051
75-25-2	Bromoform	1	<0.0025	UQ	0.0008	0.0025	0.0051
100-42-5	Styrene	1	<0.0025	UQ	0.0011	0.0025	0.0051
98-82-8	Isopropylbenzene	1	<0.0025	UQ	0.0014	0.0025	0.0051
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0025	U	0.0008	0.0025	0.0051
120-82-1	1,2,4-Trichlorobenzene	1	<0.0025	UQ	0.0022	0.0025	0.0051
541-73-1	1,3-Dichlorobenzene	1	<0.0025	UQ	0.0012	0.0025	0.0051
106-46-7	1,4-Dichlorobenzene	1	<0.0025	UQ	0.0011	0.0025	0.0051
95-50-1	1,2-Dichlorobenzene	1	<0.0025	UQ	0.0011	0.0025	0.0051
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0025	U	0.0014	0.0025	0.0051
87-61-6	1,2,3-Trichlorobenzene	1	<0.0025	UQ	0.0023	0.0025	0.0051

1.50L

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.127	0.11	85	74 - 133	
Toluene-d8	0.127	0.12	95	85 - 115	
4-Bromofluorobenzene	0.127	0.11	85	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1166983	11.31	1249106	11.31	
1,4-Difluorobenzene	1801295	11.89	1940286	11.88	
Chlorobenzene-d5	1529263	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	679024	16.89	841846	16.89	

* Values outside of QC limits

MM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD03-000H

Laboratory:	ENCO Orlando			SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)			Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Sediment	Laboratory ID:	A302428-11	File ID:	2EP011.D
Sampled:	05/15/13 08:15	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 19:34
Solids:	46.15	Preparation:	EPA 5030B MS	Initial/Final:	4.54 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0022	U UJ	0.0013	0.0022	0.0043
74-87-3	Chloromethane	1	<0.0022	U	0.0014	0.0022	0.0043
75-01-4	Vinyl chloride	1	<0.0022	U	0.0010	0.0022	0.0043
74-83-9	Bromomethane	1	<0.011	U	0.0020	0.011	0.022
75-00-3	Chloroethane	1	<0.0022	U	0.0012	0.0022	0.0043
75-69-4	Trichlorofluoromethane	1	<0.0022	U	0.0012	0.0022	0.0043
76-13-1	Freon 113	1	<0.0022	U	0.0013	0.0022	0.0043
67-64-1	Acetone	1	0.090	J	0.0037	0.027	0.054
75-35-4	1,1-Dichloroethene	1	<0.0022	U UJ	0.0013	0.0022	0.0043
75-15-0	Carbon disulfide	1	0.0084	J J	0.0046	0.011	0.022
75-09-2	Methylene Chloride	1	<0.011	U UJ	0.0015	0.011	0.022
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0022	U	0.0006	0.0022	0.0043
156-60-5	trans-1,2-Dichloroethene	1	<0.0022	U	0.0015	0.0022	0.0043
156-59-2	cis-1,2-Dichloroethene	1	<0.0022	U	0.0011	0.0022	0.0043
75-34-3	1,1-Dichloroethane	1	<0.0022	U	0.0012	0.0022	0.0043
78-93-3	2-Butanone	1	0.023	J	0.0039	0.0054	0.011
67-66-3	Chloroform	1	<0.0022	U UJ	0.0009	0.0022	0.0043
74-97-5	Bromochloromethane	1	<0.0022	U	0.0008	0.0022	0.0043
71-55-6	1,1,1-Trichloroethane	1	<0.0022	U	0.0008	0.0022	0.0043
79-20-9	Methyl acetate	1	<0.011	U	0.0035	0.011	0.022
110-82-7	Cyclohexane	1	<0.0022	U	0.0011	0.0022	0.0043
108-87-2	Methyl cyclohexane	1	<0.0022	U	0.0011	0.0022	0.0043
56-23-5	Carbon Tetrachloride	1	<0.0022	U	0.0013	0.0022	0.0043
107-06-2	1,2-Dichloroethane	1	<0.0022	U	0.0007	0.0022	0.0043
71-43-2	Benzene	1	<0.0022	U	0.0009	0.0022	0.0043
79-01-6	Trichloroethene	1	<0.0022	U	0.0011	0.0022	0.0043
78-87-5	1,2-Dichloropropane	1	<0.0022	U	0.0012	0.0022	0.0043
75-27-4	Bromodichloromethane	1	<0.0022	U	0.0008	0.0022	0.0043
108-10-1	4-Methyl-2-pentanone	1	<0.0054	U	0.0030	0.0054	0.011
591-78-6	2-Hexanone	1	<0.0054	U	0.0020	0.0054	0.011
10061-01-5	cis-1,3-Dichloropropene	1	<0.0022	U	0.0007	0.0022	0.0043
108-88-3	Toluene	1	<0.0022	U	0.0010	0.0022	0.0043
10061-02-6	trans-1,3-Dichloropropene	1	<0.0022	U	0.0007	0.0022	0.0043
79-00-5	1,1,2-Trichloroethane	1	<0.0022	U	0.0013	0.0022	0.0043

1,SOL

UM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD03-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-11	File ID:	2EP011.D
Sampled:	05/15/13 08:15	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 19:34
Solids:	46.15	Preparation:	EPA 5030B_MS	Initial/Final:	4.54 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0022	U UJ	0.0011	0.0022	0.0043
124-48-1	Dibromochloromethane	1	<0.0022	U	0.0006	0.0022	0.0043
106-93-4	1,2-Dibromoethane	1	<0.0022	U	0.0007	0.0022	0.0043
108-90-7	Chlorobenzene	1	<0.0022	U	0.0010	0.0022	0.0043
100-41-4	Ethylbenzene	1	<0.0022	U	0.0012	0.0022	0.0043
108-38-3/106-42-3	m,p-Xylenes	1	<0.0043	U	0.0021	0.0043	0.0087
95-47-6	o-Xylene	1	<0.0022	U	0.0011	0.0022	0.0043
75-25-2	Bromoform	1	<0.0022	U	0.0007	0.0022	0.0043
100-42-5	Styrene	1	<0.0022	U	0.0010	0.0022	0.0043
98-82-8	Isopropylbenzene	1	<0.0022	U	0.0012	0.0022	0.0043
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0022	U	0.0007	0.0022	0.0043
120-82-1	1,2,4-Trichlorobenzene	1	<0.0022	U	0.0018	0.0022	0.0043
541-73-1	1,3-Dichlorobenzene	1	<0.0022	U	0.0010	0.0022	0.0043
106-46-7	1,4-Dichlorobenzene	1	<0.0022	U	0.0010	0.0022	0.0043
95-50-1	1,2-Dichlorobenzene	1	<0.0022	U	0.0010	0.0022	0.0043
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0022	U	0.0012	0.0022	0.0043
87-61-6	1,2,3-Trichlorobenzene	1	<0.0022	U	0.0020	0.0022	0.0043

%SOL

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.119	0.11	89	74 - 133	
Toluene-d8	0.119	0.11	96	85 - 115	
4-Bromofluorobenzene	0.119	0.10	86	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1172884	11.32	1249106	11.31	
1,4-Difluorobenzene	1825720	11.89	1940286	11.88	
Chlorobenzene-d5	1559824	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	703867	16.9	841846	16.89	

* Values outside of QC limits

VM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD12-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-12	File ID:	2EP012.D
Sampled:	05/15/13 08:30	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 20:06
Solids:	39.13	Preparation:	EPA 5030B_MS	Initial/Final:	4.87 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0026	U UJ	0.0016	0.0026	0.0051
74-87-3	Chloromethane	1	<0.0026	U	0.0017	0.0026	0.0051
75-01-4	Vinyl chloride	1	<0.0026	U	0.0011	0.0026	0.0051
74-83-9	Bromomethane	1	<0.013	U	0.0023	0.013	0.026
75-00-3	Chloroethane	1	<0.0026	U	0.0014	0.0026	0.0051
75-69-4	Trichlorofluoromethane	1	<0.0026	U	0.0014	0.0026	0.0051
76-13-1	Freon 113	1	<0.0026	U	0.0015	0.0026	0.0051
67-64-1	Acetone	1	0.073	J	0.0043	0.032	0.064
75-35-4	1,1-Dichloroethene	1	<0.0026	U UJ	0.0016	0.0026	0.0051
75-15-0	Carbon disulfide	1	0.021	J	0.0054	0.013	0.026
75-09-2	Methylene Chloride	1	<0.013	U UJ	0.0018	0.013	0.026
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0026	U	0.0007	0.0026	0.0051
156-60-5	trans-1,2-Dichloroethene	1	<0.0026	U	0.0018	0.0026	0.0051
156-59-2	cis-1,2-Dichloroethene	1	<0.0026	U	0.0014	0.0026	0.0051
75-34-3	1,1-Dichloroethane	1	<0.0026	U	0.0015	0.0026	0.0051
78-93-3	2-Butanone	1	0.016	J	0.0046	0.0064	0.013
67-66-3	Chloroform	1	<0.0026	U UJ	0.0011	0.0026	0.0051
74-97-5	Bromochloromethane	1	<0.0026	U	0.0009	0.0026	0.0051
71-55-6	1,1,1-Trichloroethane	1	<0.0026	U	0.0009	0.0026	0.0051
79-20-9	Methyl acetate	1	<0.013	U	0.0041	0.013	0.026
110-82-7	Cyclohexane	1	<0.0026	U	0.0014	0.0026	0.0051
108-87-2	Methyl cyclohexane	1	<0.0026	U	0.0013	0.0026	0.0051
56-23-5	Carbon Tetrachloride	1	<0.0026	U	0.0015	0.0026	0.0051
107-06-2	1,2-Dichloroethane	1	<0.0026	U	0.0008	0.0026	0.0051
71-43-2	Benzene	1	<0.0026	U	0.0010	0.0026	0.0051
79-01-6	Trichloroethene	1	<0.0026	U	0.0013	0.0026	0.0051
78-87-5	1,2-Dichloropropane	1	<0.0026	U	0.0014	0.0026	0.0051
75-27-4	Bromodichloromethane	1	<0.0026	U	0.0009	0.0026	0.0051
108-10-1	4-Methyl-2-pentanone	1	<0.0064	U	0.0036	0.0064	0.013
591-78-6	2-Hexanone	1	<0.0064	U	0.0023	0.0064	0.013
10061-01-5	cis-1,3-Dichloropropene	1	<0.0026	U	0.0008	0.0026	0.0051
108-88-3	Toluene	1	<0.0026	U	0.0012	0.0026	0.0051
10061-02-6	trans-1,3-Dichloropropene	1	<0.0026	U	0.0008	0.0026	0.0051
79-00-5	1,1,2-Trichloroethane	1	<0.0026	U	0.0015	0.0026	0.0051

%SOL

UMA 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD12-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-12	File ID:	2EP012.D
Sampled:	05/15/13 08:30	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 20:06
Solids:	39.13	Preparation:	EPA 5030B_MS	Initial/Final:	4.87 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0026	U UJ	0.0013	0.0026	0.0051
124-48-1	Dibromochloromethane	1	<0.0026	U	0.0007	0.0026	0.0051
106-93-4	1,2-Dibromoethane	1	<0.0026	U	0.0008	0.0026	0.0051
108-90-7	Chlorobenzene	1	<0.0026	U	0.0012	0.0026	0.0051
100-41-4	Ethylbenzene	1	<0.0026	U	0.0014	0.0026	0.0051
108-38-3/106-42-3	m,p-Xylenes	1	<0.0051	U	0.0025	0.0051	0.010
95-47-6	o-Xylene	1	<0.0026	U	0.0013	0.0026	0.0051
75-25-2	Bromoform	1	<0.0026	U	0.0008	0.0026	0.0051
100-42-5	Styrene	1	<0.0026	U	0.0011	0.0026	0.0051
98-82-8	Isopropylbenzene	1	<0.0026	U	0.0014	0.0026	0.0051
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0026	U	0.0008	0.0026	0.0051
120-82-1	1,2,4-Trichlorobenzene	1	<0.0026	U	0.0022	0.0026	0.0051
541-73-1	1,3-Dichlorobenzene	1	<0.0026	U	0.0012	0.0026	0.0051
106-46-7	1,4-Dichlorobenzene	1	<0.0026	U	0.0011	0.0026	0.0051
95-50-1	1,2-Dichlorobenzene	1	<0.0026	U	0.0011	0.0026	0.0051
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0026	U	0.0015	0.0026	0.0051
87-61-6	1,2,3-Trichlorobenzene	1	<0.0026	U	0.0023	0.0026	0.0051

1/SOL

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.131	0.12	88	74 - 133	
Toluene-d8	0.131	0.13	98	85 - 115	
4-Bromofluorobenzene	0.131	0.12	89	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1156713	11.31	1249106	11.31	
1,4-Difluorobenzene	1806709	11.89	1940286	11.88	
Chlorobenzene-d5	1515307	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	693216	16.89	841846	16.89	

* Values outside of QC limits

LM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD02-0H01

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-13	File ID:	2EP013.D
Sampled:	05/15/13 10:00	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 20:37
Solids:	54.91	Preparation:	EPA 5030B_MS	Initial/Final:	4.74 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0018	U UJ	0.0011	0.0018	0.0036
74-87-3	Chloromethane	1	<0.0018	U	0.0012	0.0018	0.0036
75-01-4	Vinyl chloride	1	<0.0018	U	0.0008	0.0018	0.0036
74-83-9	Bromomethane	1	<0.0091	U	0.0016	0.0091	0.018
75-00-3	Chloroethane	1	<0.0018	U	0.0010	0.0018	0.0036
75-69-4	Trichlorofluoromethane	1	<0.0018	U	0.0010	0.0018	0.0036
76-13-1	Freon 113	1	<0.0018	U	0.0011	0.0018	0.0036
67-64-1	Acetone	1	0.10	J	0.0031	0.023	0.046
75-35-4	1,1-Dichloroethene	1	<0.0018	U UJ	0.0011	0.0018	0.0036
75-15-0	Carbon disulfide	1	<0.0091	U	0.0038	0.0091	0.018
75-09-2	Methylene Chloride	1	<0.0091	U	0.0013	0.0091	0.018
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0018	U	0.0005	0.0018	0.0036
156-60-5	trans-1,2-Dichloroethene	1	<0.0018	U	0.0013	0.0018	0.0036
156-59-2	cis-1,2-Dichloroethene	1	<0.0018	U	0.0010	0.0018	0.0036
75-34-3	1,1-Dichloroethane	1	<0.0018	U	0.0010	0.0018	0.0036
78-93-3	2-Butanone	1	0.027	J	0.0033	0.0046	0.0091
67-66-3	Chloroform	1	<0.0018	U UJ	0.0008	0.0018	0.0036
74-97-5	Bromochloromethane	1	<0.0018	U	0.0006	0.0018	0.0036
71-55-6	1,1,1-Trichloroethane	1	<0.0018	U	0.0006	0.0018	0.0036
79-20-9	Methyl acetate	1	<0.0091	U	0.0029	0.0091	0.018
110-82-7	Cyclohexane	1	<0.0018	U	0.0010	0.0018	0.0036
108-87-2	Methyl cyclohexane	1	<0.0018	U	0.0009	0.0018	0.0036
56-23-5	Carbon Tetrachloride	1	<0.0018	U	0.0011	0.0018	0.0036
107-06-2	1,2-Dichloroethane	1	<0.0018	U	0.0006	0.0018	0.0036
71-43-2	Benzene	1	<0.0018	U	0.0007	0.0018	0.0036
79-01-6	Trichloroethene	1	<0.0018	U	0.0009	0.0018	0.0036
78-87-5	1,2-Dichloropropane	1	<0.0018	U	0.0010	0.0018	0.0036
75-27-4	Bromodichloromethane	1	<0.0018	U	0.0006	0.0018	0.0036
108-10-1	4-Methyl-2-pentanone	1	<0.0046	U	0.0025	0.0046	0.0091
591-78-6	2-Hexanone	1	<0.0046	U	0.0017	0.0046	0.0091
10061-01-5	cis-1,3-Dichloropropene	1	<0.0018	U	0.0005	0.0018	0.0036
108-88-3	Toluene	1	<0.0018	U	0.0008	0.0018	0.0036
10061-02-6	trans-1,3-Dichloropropene	1	<0.0018	U	0.0006	0.0018	0.0036
79-00-5	1,1,2-Trichloroethane	1	<0.0018	U	0.0011	0.0018	0.0036

SSL

UA 07/09/13

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD02-0H01

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-13	File ID:	2EP013.D
Sampled:	05/15/13 10:00	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 20:37
Solids:	54.91	Preparation:	EPA 5030B_MS	Initial/Final:	4.74 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0018	U UJ	0.0009	0.0018	0.0036 SSL
124-48-1	Dibromochloromethane	1	<0.0018	U	0.0005	0.0018	0.0036
106-93-4	1,2-Dibromoethane	1	<0.0018	U	0.0006	0.0018	0.0036
108-90-7	Chlorobenzene	1	<0.0018	U	0.0009	0.0018	0.0036
100-41-4	Ethylbenzene	1	<0.0018	U	0.0010	0.0018	0.0036
108-38-3/106-42-3	m,p-Xylenes	1	<0.0036	U	0.0018	0.0036	0.0073
95-47-6	o-Xylene	1	<0.0018	U	0.0009	0.0018	0.0036
75-25-2	Bromoform	1	<0.0018	U	0.0005	0.0018	0.0036
100-42-5	Styrene	1	<0.0018	U	0.0008	0.0018	0.0036
98-82-8	Isopropylbenzene	1	<0.0018	U	0.0010	0.0018	0.0036
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0018	U	0.0005	0.0018	0.0036
120-82-1	1,2,4-Trichlorobenzene	1	<0.0018	U	0.0015	0.0018	0.0036
541-73-1	1,3-Dichlorobenzene	1	<0.0018	U	0.0009	0.0018	0.0036
106-46-7	1,4-Dichlorobenzene	1	<0.0018	U	0.0008	0.0018	0.0036
95-50-1	1,2-Dichlorobenzene	1	<0.0018	U	0.0008	0.0018	0.0036
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0018	U	0.0010	0.0018	0.0036
87-61-6	1,2,3-Trichlorobenzene	1	<0.0018	U	0.0017	0.0018	0.0036

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.0961	0.083	86	74 - 133	
Toluene-d8	0.0961	0.093	96	85 - 115	
4-Bromofluorobenzene	0.0961	0.079	83	85 - 120	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1181167	11.32	1249106	11.31	
1,4-Difluorobenzene	1835979	11.89	1940286	11.88	
Chlorobenzene-d5	1570657	14.55	1665139	14.55	
1,4-Dichlorobenzene-d4	702886	16.89	841846	16.89	

* Values outside of QC limits

VM 070713

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-EB01-051513-SD

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302428-14	File ID:	3ES010.D
Sampled:	05/15/13 07:00	Prepared:	05/24/13 12:57	Analyzed:	05/24/13 18:14
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 3E24030 Sequence: AA24312 Calibration: 1304028 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<1.0	U	0.74	1.0	2.0
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0
75-01-4	Vinyl chloride	1	<1.0	U	0.71	1.0	2.0
74-83-9	Bromomethane	1	<1.0	U	0.95	1.0	2.0
75-00-3	Chloroethane	1	<1.0	U	0.98	1.0	2.0
75-69-4	Trichlorofluoromethane	1	<1.0	U	0.94	1.0	2.0
76-13-1	Freon 113	1	<1.0	U	0.73	1.0	2.0
67-64-1	Acetone	1	<12	U	1.8	12	25
75-35-4	1,1-Dichloroethene	1	<1.0	U	0.94	1.0	2.0
75-15-0	Carbon disulfide	1	<5.0	U	2.6	5.0	10
75-09-2	Methylene Chloride	1	<5.0	U	0.71	5.0	10
1634-04-4	Methyl-tert-Butyl Ether	1	<1.0	U	0.60	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	<1.0	U	0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene	1	<1.0	U	0.53	1.0	2.0
75-34-3	1,1-Dichloroethane	1	<1.0	U	0.62	1.0	2.0
78-93-3	2-Butanone	1	<12	~~U~~ R	4.5	12	25 ICL
67-66-3	Chloroform	1	<1.0	U	0.80	1.0	2.0
74-97-5	Bromochloromethane	1	<1.0	U	0.94	1.0	2.0
71-55-6	1,1,1-Trichloroethane	1	<1.0	U	0.80	1.0	2.0
79-20-9	Methyl acetate	1	<1.0	U	0.95	1.0	2.0
110-82-7	Cyclohexane	1	<1.0	U	0.93	1.0	2.0
108-87-2	Methyl cyclohexane	1	<1.0	U	0.64	1.0	2.0
56-23-5	Carbon Tetrachloride	1	<1.0	U	0.94	1.0	2.0
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0
79-01-6	Trichloroethene	1	<1.0	U	0.89	1.0	2.0
78-87-5	1,2-Dichloropropane	1	<1.0	U	0.80	1.0	2.0
75-27-4	Bromodichloromethane	1	<1.0	U	0.52	1.0	2.0
108-10-1	4-Methyl-2-pentanone	1	<2.5	~~U~~ R	0.79	2.5	5.0 ICL
591-78-6	2-Hexanone	1	<2.5	U	1.4	2.5	5.0
10061-01-5	cis-1,3-Dichloropropene	1	<1.0	U	0.59	1.0	2.0
108-88-3	Toluene	1	<1.0	U	0.72	1.0	2.0
10061-02-6	trans-1,3-Dichloropropene	1	<1.0	U	0.73	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U	0.76	1.0	2.0

UM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-EB01-051513-SD

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302428-14	File ID:	3ES010.D
Sampled:	05/15/13 07:00	Prepared:	05/24/13 12:57	Analyzed:	05/24/13 18:14
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 3E24030 Sequence: AA24312 Calibration: 1304028 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
124-48-1	Dibromochloromethane	1	<1.0	U	0.44	1.0	2.0
106-93-4	1,2-Dibromoethane	1	<1.0	U	0.78	1.0	2.0
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
108-38-3/106-42-3	m,p-Xylenes	1	<2.0	U	1.3	2.0	4.0
95-47-6	o-Xylene	1	<1.0	U	0.53	1.0	2.0
75-25-2	Bromoform	1	<1.0	U	0.75	1.0	2.0
100-42-5	Styrene	1	<1.0	U	0.61	1.0	2.0
98-82-8	Isopropylbenzene	1	<1.0	U	0.67	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
120-82-1	1,2,4-Trichlorobenzene	1	<1.0	U	0.70	1.0	2.0
541-73-1	1,3-Dichlorobenzene	1	<1.0	U	0.77	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0
95-50-1	1,2-Dichlorobenzene	1	<1.0	U	0.73	1.0	2.0
96-12-8	1,2-Dibromo-3-chloropropane	1	<5.0	U	0.96	5.0	10
87-61-6	1,2,3-Trichlorobenzene	1	<1.0	U	0.86	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	52	105	85 - 115	
Toluene-d8	50.0	54	108	85 - 120	
4-Bromofluorobenzene	50.0	52	103	75 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1292944	11.47	1457190	11.48	
1,4-Difluorobenzene	1877632	12.06	2274265	12.06	
Chlorobenzene-d5	1775768	14.75	2013436	14.76	
1,4-Dichlorobenzene-d4	757330	17.13	916476	17.15	

* Values outside of QC limits

UM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-TB01-051513-SD

Laboratory: ENCO Orlando SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Matrix: Water Laboratory ID: A302428-15 File ID: 3ES011.D

Sampled: 05/15/13 08:00 Prepared: 05/24/13 12:57 Analyzed: 05/24/13 18:44

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 3E24030 Sequence: AA24312 Calibration: 1304028 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<1.0	U	0.74	1.0	2.0
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0
75-01-4	Vinyl chloride	1	<1.0	U	0.71	1.0	2.0
74-83-9	Bromomethane	1	<1.0	U	0.95	1.0	2.0
75-00-3	Chloroethane	1	<1.0	U	0.98	1.0	2.0
75-69-4	Trichlorofluoromethane	1	<1.0	U	0.94	1.0	2.0
76-13-1	Freon 113	1	<1.0	U	0.73	1.0	2.0
67-64-1	Acetone	1	<12	U	1.8	12	25
75-35-4	1,1-Dichloroethene	1	<1.0	U	0.94	1.0	2.0
75-15-0	Carbon disulfide	1	<5.0	U	2.6	5.0	10
75-09-2	Methylene Chloride	1	<5.0	U	0.71	5.0	10
1634-04-4	Methyl-tert-Butyl Ether	1	<1.0	U	0.60	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	<1.0	U	0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene	1	<1.0	U	0.53	1.0	2.0
75-34-3	1,1-Dichloroethane	1	<1.0	U	0.62	1.0	2.0
78-93-3	2-Butanone	1	<12	~~UR~~	4.5	12	25 ICL
67-66-3	Chloroform	1	<1.0	U	0.80	1.0	2.0
74-97-5	Bromochloromethane	1	<1.0	U	0.94	1.0	2.0
71-55-6	1,1,1-Trichloroethane	1	<1.0	U	0.80	1.0	2.0
79-20-9	Methyl acetate	1	<1.0	U	0.95	1.0	2.0
110-82-7	Cyclohexane	1	<1.0	U	0.93	1.0	2.0
108-87-2	Methyl cyclohexane	1	<1.0	U	0.64	1.0	2.0
56-23-5	Carbon Tetrachloride	1	<1.0	U	0.94	1.0	2.0
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0
79-01-6	Trichloroethene	1	<1.0	U	0.89	1.0	2.0
78-87-5	1,2-Dichloropropane	1	<1.0	U	0.80	1.0	2.0
75-27-4	Bromodichloromethane	1	<1.0	U	0.52	1.0	2.0
108-10-1	4-Methyl-2-pentanone	1	<2.5	~~UR~~	0.79	2.5	5.0 ICL
591-78-6	2-Hexanone	1	<2.5	U	1.4	2.5	5.0
10061-01-5	cis-1,3-Dichloropropene	1	<1.0	U	0.59	1.0	2.0
108-88-3	Toluene	1	<1.0	U	0.72	1.0	2.0
10061-02-6	trans-1,3-Dichloropropene	1	<1.0	U	0.73	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U	0.76	1.0	2.0

UM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-TB01-051513-SD

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302428-15	File ID:	3ES011.D
Sampled:	05/15/13 08:00	Prepared:	05/24/13 12:57	Analyzed:	05/24/13 18:44
Solids:		Preparation:	EPA 5030B MS	Initial/Final:	5 mL / 5 mL

Batch: 3E24030 Sequence: AA24312 Calibration: 1304028 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
124-48-1	Dibromochloromethane	1	<1.0	U	0.44	1.0	2.0
106-93-4	1,2-Dibromoethane	1	<1.0	U	0.78	1.0	2.0
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
108-38-3/106-42-3	m,p-Xylenes	1	<2.0	U	1.3	2.0	4.0
95-47-6	o-Xylene	1	<1.0	U	0.53	1.0	2.0
75-25-2	Bromoform	1	<1.0	U	0.75	1.0	2.0
100-42-5	Styrene	1	<1.0	U	0.61	1.0	2.0
98-82-8	Isopropylbenzene	1	<1.0	U	0.67	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
120-82-1	1,2,4-Trichlorobenzene	1	<1.0	U	0.70	1.0	2.0
541-73-1	1,3-Dichlorobenzene	1	<1.0	U	0.77	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0
95-50-1	1,2-Dichlorobenzene	1	<1.0	U	0.73	1.0	2.0
96-12-8	1,2-Dibromo-3-chloropropane	1	<5.0	U	0.96	5.0	10
87-61-6	1,2,3-Trichlorobenzene	1	<1.0	U	0.86	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	108	85 - 115	
Toluene-d8	50.0	56	112	85 - 120	
4-Bromofluorobenzene	50.0	52	104	75 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1231845	11.47	1457190	11.48	
1,4-Difluorobenzene	1820439	12.06	2274265	12.06	
Chlorobenzene-d5	1632122	14.75	2013436	14.76	
1,4-Dichlorobenzene-d4	821250	17.13	916476	17.15	

* Values outside of QC limits

UM 07/04/13

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD01-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-07	File ID:	1f3010.D
Sampled:	05/15/13 10:30	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 13:36
Solids:	54.93	Preparation:	EPA 3550C MS	Initial/Final:	30.3 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.18	U	0.18	0.18	0.60
108-95-2	Phenol	1	<0.18	U	0.14	0.18	0.60
111-44-4	Bis(2-chloroethyl)ether	1	<0.18	U	0.17	0.18	0.60
95-57-8	2-Chlorophenol	1	<0.18	U	0.15	0.18	0.60
95-48-7	2-Methylphenol	1	<0.18	U	0.13	0.18	0.60
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.18	U	0.15	0.18	0.60
98-86-2	Acetophenone	1	<0.18	U	0.15	0.18	0.60
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.36	U	0.29	0.36	0.60
621-64-7	N-Nitroso-di-n-propylamine	1	<0.18	U	0.16	0.18	0.60
67-72-1	Hexachloroethane	1	<0.18	U	0.13	0.18	0.60
98-95-3	Nitrobenzene	1	<0.18	U	0.14	0.18	0.60
78-59-1	Isophorone	1	<0.18	U	0.13	0.18	0.60
88-75-5	2-Nitrophenol	1	<0.18	U	0.14	0.18	0.60
105-67-9	2,4-Dimethylphenol	1	<0.18	U	0.13	0.18	0.60
111-91-1	Bis(2-chloroethoxy)methane	1	<0.18	U	0.12	0.18	0.60
120-83-2	2,4-Dichlorophenol	1	<0.18	U	0.13	0.18	0.60
106-47-8	4-Chloroaniline	1	<0.18	U	0.17	0.18	0.60
87-68-3	Hexachlorobutadiene	1	<0.18	U	0.15	0.18	0.60
105-60-2	Caprolactam	1	<0.36	U	0.18	0.36	0.60
59-50-7	4-Chloro-3-methylphenol	1	<0.18	U	0.12	0.18	0.60
77-47-4	Hexachlorocyclopentadiene	1	<0.18	U	0.17	0.18	0.60
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.18	U	0.13	0.18	0.60
88-06-2	2,4,6-Trichlorophenol	1	<0.18	U	0.11	0.18	0.60
95-95-4	2,4,5-Trichlorophenol	1	<0.18	U	0.11	0.18	0.60
92-52-4	1,1'-Biphenyl	1	<0.18	U	0.17	0.18	0.60
88-74-4	2-Nitroaniline	1	<0.18	U	0.12	0.18	0.60
131-11-3	Dimethylphthalate	1	<0.18	U	0.11	0.18	0.60
606-20-2	2,6-Dinitrotoluene	1	<0.18	U	0.13	0.18	0.60
99-09-2	3-Nitroaniline	1	<0.18	U	0.13	0.18	0.60
51-28-5	2,4-Dinitrophenol	1	<0.55	~~UQ~~ UJ	0.22	0.55	0.60 ICH
100-02-7	4-Nitrophenol	1	<0.18	~~UQ~~ UJ	0.15	0.18	0.60 CCH
132-64-9	Dibenzofuran	1	<0.18	U	0.12	0.18	0.60
121-14-2	2,4-Dinitrotoluene	1	<0.18	~~U~~ UJ	0.13	0.18	0.60 CCH

UM 07/09/13

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD01-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-07	File ID:	1f3010.D
Sampled:	05/15/13 10:30	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 13:36
Solids:	54.93	Preparation:	EPA 3550C_MS	Initial/Final:	30.3 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.36	U	0.13	0.36	0.60
84-66-2	Diethylphthalate	1	<0.18	U	0.14	0.18	0.60
7005-72-3	4-Chlorophenyl-phenylether	1	<0.18	U	0.12	0.18	0.60
100-01-6	4-Nitroaniline	1	<0.18	~~UQ~~ UJ	0.15	0.18	0.60 CLH
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.55	~~U~~ UJ	0.24	0.55	0.60 JLH
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.36	U	0.25	0.36	0.60
101-55-3	4-Bromophenyl-phenylether	1	<0.18	U	0.13	0.18	0.60
118-74-1	Hexachlorobenzene	1	<0.18	U	0.15	0.18	0.60
1912-24-9	Atrazine	1	<0.18	U	0.13	0.18	0.60
87-86-5	Pentachlorophenol	1	<0.55	U	0.25	0.55	0.60
86-74-8	Carbazole	1	<0.18	U	0.12	0.18	0.60
84-74-2	Di-n-butylphthalate	1	<0.18	U	0.14	0.18	0.60
85-68-7	Butylbenzylphthalate	1	<0.18	~~UQ~~ UJ	0.17	0.18	0.60 CLH
91-94-1	3,3'-Dichlorobenzidine	1	<0.18	U	0.17	0.18	0.60
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.18	U	0.15	0.18	0.60
117-84-0	Di-n-octylphthalate	1	<0.18	U	0.12	0.18	0.60

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	3.00	1.3	45	35 - 105	
Phenol-d5	3.00	1.6	52	40 - 100	
Nitrobenzene-d5	3.00	1.0	35	35 - 100	
2-Fluorobiphenyl	3.00	0.57	19	45 - 105	*
2,4,6-Tribromophenol	3.00	1.4	46	35 - 125	
Terphenyl-d14	3.00	1.7	58	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	253013	6.876	376297	6.946	
Naphthalene-d8	896068	8.443	1445935	8.527	
Acenaphthene-d10	475267	10.65	860713	10.734	
Phenanthrene-d10	772091	12.518	1334701	12.61	
Chrysene-d12	539608	16.096	771095	16.217	
Perylene-d12	348705	19.048	620417	19.175	

* Values outside of QC limits

UM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD01-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-07RE1	File ID:	1fe016.D
Sampled:	05/15/13 10:30	Prepared:	06/07/13 09:45	Analyzed:	06/10/13 18:04
Solids:	54.93	Preparation:	EPA 3550C MS	Initial/Final:	30 g / 1 mL

Batch: 3F06021 Sequence: AA24468 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.18	UQ	0.18	0.18	0.60
108-95-2	Phenol	1	<0.18	UQ	0.14	0.18	0.60
111-44-4	Bis(2-chloroethyl)ether	1	<0.18	UQ	0.17	0.18	0.60
95-57-8	2-Chlorophenol	1	<0.18	UQ	0.15	0.18	0.60
95-48-7	2-Methylphenol	1	<0.18	UQ	0.13	0.18	0.60
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.18	UQ	0.15	0.18	0.60
98-86-2	Acetophenone	1	<0.18	UQ	0.15	0.18	0.60
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.36	UQ	0.29	0.36	0.60
621-64-7	N-Nitroso-di-n-propylamine	1	<0.18	UQ	0.16	0.18	0.60
67-72-1	Hexachloroethane	1	<0.18	UQ	0.13	0.18	0.60
98-95-3	Nitrobenzene	1	<0.18	UQ	0.14	0.18	0.60
78-59-1	Isophorone	1	<0.18	UQ	0.13	0.18	0.60
88-75-5	2-Nitrophenol	1	<0.18	UQ	0.14	0.18	0.60
105-67-9	2,4-Dimethylphenol	1	<0.18	UQ	0.13	0.18	0.60
111-91-1	Bis(2-chloroethoxy)methane	1	<0.18	UQ	0.12	0.18	0.60
120-83-2	2,4-Dichlorophenol	1	<0.18	UQ	0.13	0.18	0.60
106-47-8	4-Chloroaniline	1	<0.18	UQ	0.17	0.18	0.60
87-68-3	Hexachlorobutadiene	1	<0.18	UQ	0.15	0.18	0.60
105-60-2	Caprolactam	1	<0.36	UQ	0.18	0.36	0.60
59-50-7	4-Chloro-3-methylphenol	1	<0.18	UQ	0.12	0.18	0.60
77-47-4	Hexachlorocyclopentadiene	1	<0.18	UQ	0.17	0.18	0.60
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.18	UQ	0.13	0.18	0.60
88-06-2	2,4,6-Trichlorophenol	1	<0.18	UQ	0.11	0.18	0.60
95-95-4	2,4,5-Trichlorophenol	1	<0.18	UQ	0.11	0.18	0.60
92-52-4	1,1'-Biphenyl	1	<0.18	UQ	0.17	0.18	0.60
88-74-4	2-Nitroaniline	1	<0.18	UQ	0.12	0.18	0.60
131-11-3	Dimethylphthalate	1	<0.18	UQ	0.11	0.18	0.60
606-20-2	2,6-Dinitrotoluene	1	<0.18	UQ	0.13	0.18	0.60
99-09-2	3-Nitroaniline	1	<0.18	UQ	0.13	0.18	0.60
51-28-5	2,4-Dinitrophenol	1	<0.55	UQ	0.22	0.55	0.60
100-02-7	4-Nitrophenol	1	<0.18	UQ	0.15	0.18	0.60
132-64-9	Dibenzofuran	1	<0.18	UQ	0.12	0.18	0.60
121-14-2	2,4-Dinitrotoluene	1	<0.18	UQ	0.13	0.18	0.60

RE

070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD01-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-07RE1	File ID:	1fe016.D
Sampled:	05/15/13 10:30	Prepared:	06/07/13 09:45	Analyzed:	06/10/13 18:04
Solids:	54.93	Preparation:	EPA 3550C MS	Initial/Final:	30 g / 1 mL

Batch: 3F06021 Sequence: AA24468 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.36	UQ	0.13	0.36	0.60
84-66-2	Diethylphthalate	1	<0.18	UQ	0.14	0.18	0.60
7005-72-3	4-Chlorophenyl-phenylether	1	<0.18	UQ	0.12	0.18	0.60
100-01-6	4-Nitroaniline	1	<0.18	UQ	0.15	0.18	0.60
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.55	UQ	0.24	0.55	0.60
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.36	UQ	0.25	0.36	0.60
101-55-3	4-Bromophenyl-phenylether	1	<0.18	UQ	0.13	0.18	0.60
118-74-1	Hexachlorobenzene	1	<0.18	UQ	0.15	0.18	0.60
1912-24-9	Atrazine	1	<0.18	UQ	0.13	0.18	0.60
87-86-5	Pentachlorophenol	1	<0.55	UQ	0.25	0.55	0.60
86-74-8	Carbazole	1	<0.18	UQ	0.12	0.18	0.60
84-74-2	Di-n-butylphthalate	1	<0.18	UQ	0.14	0.18	0.60
85-68-7	Butylbenzylphthalate	1	<0.18	UQ	0.17	0.18	0.60
91-94-1	3,3'-Dichlorobenzidine	1	<0.18	UQ	0.17	0.18	0.60
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.18	UQ	0.15	0.18	0.60
117-84-0	Di-n-octylphthalate	1	<0.18	UQ	0.12	0.18	0.60

RE

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	3.03	1.9	62	35 - 105	
Phenol-d5	3.03	2.3	75	40 - 100	
Nitrobenzene-d5	3.03	1.5	48	35 - 100	
2-Fluorobiphenyl	3.03	0.65	22	45 - 105	*
2,4,6-Tribromophenol	3.03	2.0	66	35 - 125	
Terphenyl-d14	3.03	1.7	55	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	268555	6.786	376297	6.946	
Naphthalene-d8	1043981	8.36	1445935	8.527	
Acenaphthene-d10	594117	10.557	860713	10.734	
Phenanthrene-d10	979710	12.425	1334701	12.61	
Chrysene-d12	650806	15.964	771095	16.217	
Perylene-d12	510592	18.896	620417	19.175	

* Values outside of QC limits

LM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD01P-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-08	File ID:	1f3011.D
Sampled:	05/15/13 10:30	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 14:04
Solids:	55.28	Preparation:	EPA 3550C MS	Initial/Final:	30.4 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ	
100-52-7	Benzaldehyde	1	<0.18	~~U~~ UJ	0.18	0.18	0.60	SSL
108-95-2	Phenol	1	<0.18	U	0.14	0.18	0.60	
111-44-4	Bis(2-chloroethyl)ether	1	<0.18	~~U~~ UJ	0.17	0.18	0.60	SSL
95-57-8	2-Chlorophenol	1	<0.18	U	0.15	0.18	0.60	
95-48-7	2-Methylphenol	1	<0.18	U	0.13	0.18	0.60	
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.18	~~U~~ UJ	0.15	0.18	0.60	SSL
98-86-2	Acetophenone	1	<0.18	~~U~~ UJ	0.15	0.18	0.60	SSL
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.36	U	0.29	0.36	0.60	
621-64-7	N-Nitroso-di-n-propylamine	1	<0.18	~~U~~ UJ	0.16	0.18	0.60	SSL
67-72-1	Hexachloroethane	1	<0.18	U	0.13	0.18	0.60	
98-95-3	Nitrobenzene	1	<0.18	U	0.14	0.18	0.60	
78-59-1	Isophorone	1	<0.18	U	0.13	0.18	0.60	
88-75-5	2-Nitrophenol	1	<0.18	U	0.14	0.18	0.60	
105-67-9	2,4-Dimethylphenol	1	<0.18	U	0.13	0.18	0.60	
111-91-1	Bis(2-chloroethoxy)methane	1	<0.18	~~U~~ UJ	0.12	0.18	0.60	SSL
120-83-2	2,4-Dichlorophenol	1	<0.18	U	0.13	0.18	0.60	
106-47-8	4-Chloroaniline	1	<0.18	~~U~~ UJ	0.17	0.18	0.60	SSL
87-68-3	Hexachlorobutadiene	1	<0.18	U	0.14	0.18	0.60	
105-60-2	Caprolactam	1	<0.36	U	0.18	0.36	0.60	
59-50-7	4-Chloro-3-methylphenol	1	<0.18	U	0.12	0.18	0.60	
77-47-4	Hexachlorocyclopentadiene	1	<0.18	~~U~~ UJ	0.17	0.18	0.60	SSL
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.18	~~U~~ UJ	0.12	0.18	0.60	SSL
88-06-2	2,4,6-Trichlorophenol	1	<0.18	U	0.11	0.18	0.60	
95-95-4	2,4,5-Trichlorophenol	1	<0.18	U	0.10	0.18	0.60	
92-52-4	1,1'-Biphenyl	1	<0.18	~~U~~ UJ	0.17	0.18	0.60	SSL
88-74-4	2-Nitroaniline	1	<0.18	U	0.12	0.18	0.60	
131-11-3	Dimethylphthalate	1	<0.18	U	0.11	0.18	0.60	
606-20-2	2,6-Dinitrotoluene	1	<0.18	U	0.12	0.18	0.60	
99-09-2	3-Nitroaniline	1	<0.18	U	0.13	0.18	0.60	
51-28-5	2,4-Dinitrophenol	1	<0.54	~~UQ~~ UJ	0.22	0.54	0.60	ICH
100-02-7	4-Nitrophenol	1	<0.18	~~UQ~~ UJ	0.15	0.18	0.60	CCH
132-64-9	Dibenzofuran	1	<0.18	~~U~~ UJ	0.12	0.18	0.60	SSL
121-14-2	2,4-Dinitrotoluene	1	<0.18	~~U~~ UJ	0.13	0.18	0.60	SSL

UM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD01P-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-08	File ID:	1f3011.D
Sampled:	05/15/13 10:30	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 14:04
Solids:	55.28	Preparation:	EPA 3550C_MS	Initial/Final:	30.4 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.36	U	0.13	0.36	0.60
84-66-2	Diethylphthalate	1	<0.18	~~U~~ UJ	0.14	0.18	0.60 SGL
7005-72-3	4-Chlorophenyl-phenylether	1	<0.18	~~U~~	0.12	0.18	0.60
100-01-6	4-Nitroaniline	1	<0.18	~~UQ~~	0.15	0.18	0.60
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.54	~~U~~ UJ	0.24	0.54	0.60 JCH
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.36	~~U~~ UJ	0.25	0.36	0.60 SGL
101-55-3	4-Bromophenyl-phenylether	1	<0.18	~~U~~	0.13	0.18	0.60
118-74-1	Hexachlorobenzene	1	<0.18	~~U~~	0.15	0.18	0.60
1912-24-9	Atrazine	1	<0.18	~~U~~	0.13	0.18	0.60
87-86-5	Pentachlorophenol	1	<0.54	U	0.25	0.54	0.60
86-74-8	Carbazole	1	<0.18	~~U~~ UJ	0.12	0.18	0.60 SGL
84-74-2	Di-n-butylphthalate	1	<0.18	U	0.14	0.18	0.60
85-68-7	Butylbenzylphthalate	1	<0.18	UQ	0.17	0.18	0.60
91-94-1	3,3'-Dichlorobenzidine	1	<0.18	U	0.16	0.18	0.60
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.18	U	0.15	0.18	0.60
117-84-0	Di-n-octylphthalate	1	<0.18	U	0.12	0.18	0.60

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	2.98	1.2	40	35 - 105	
Phenol-d5	2.98	1.4	46	40 - 100	
Nitrobenzene-d5	2.98	1.0	34	35 - 100	*
2-Fluorobiphenyl	2.98	0.74	25	45 - 105	*
2,4,6-Tribromophenol	2.98	1.3	45	35 - 125	
Terphenyl-d14	2.98	1.7	58	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	317340	6.876	376297	6.946	
Naphthalene-d8	1137189	8.443	1445935	8.527	
Acenaphthene-d10	614000	10.65	860713	10.734	
Phenanthrene-d10	976926	12.518	1334701	12.61	
Chrysene-d12	695699	16.096	771095	16.217	
Perylene-d12	461553	19.048	620417	19.175	

* Values outside of QC limits

070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD01-0H01

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-09	File ID:	1f3012.D
Sampled:	05/15/13 10:45	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 14:33
Solids:	60.93	Preparation:	EPA 3550C MS	Initial/Final:	30.5 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.16	U UJ	0.16	0.16	0.54 SSL
108-95-2	Phenol	1	<0.16	U	0.12	0.16	0.54
111-44-4	Bis(2-chloroethyl)ether	1	<0.16	U	0.15	0.16	0.54
95-57-8	2-Chlorophenol	1	<0.16	U	0.13	0.16	0.54
95-48-7	2-Methylphenol	1	<0.16	U	0.11	0.16	0.54
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.16	U	0.13	0.16	0.54
98-86-2	Acetophenone	1	<0.16	U	0.14	0.16	0.54
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.33	U	0.26	0.33	0.54
621-64-7	N-Nitroso-di-n-propylamine	1	<0.16	U	0.15	0.16	0.54
67-72-1	Hexachloroethane	1	<0.16	U	0.12	0.16	0.54
98-95-3	Nitrobenzene	1	<0.16	U	0.13	0.16	0.54
78-59-1	Isophorone	1	<0.16	U	0.12	0.16	0.54
88-75-5	2-Nitrophenol	1	<0.16	U	0.13	0.16	0.54
105-67-9	2,4-Dimethylphenol	1	<0.16	U	0.12	0.16	0.54
111-91-1	Bis(2-chloroethoxy)methane	1	<0.16	U	0.11	0.16	0.54
120-83-2	2,4-Dichlorophenol	1	<0.16	U	0.12	0.16	0.54
106-47-8	4-Chloroaniline	1	<0.16	U	0.15	0.16	0.54
87-68-3	Hexachlorobutadiene	1	<0.16	U	0.13	0.16	0.54
105-60-2	Caprolactam	1	<0.33	U	0.16	0.33	0.54
59-50-7	4-Chloro-3-methylphenol	1	<0.16	U	0.11	0.16	0.54
77-47-4	Hexachlorocyclopentadiene	1	<0.16	U	0.15	0.16	0.54
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.16	U	0.11	0.16	0.54
88-06-2	2,4,6-Trichlorophenol	1	<0.16	U	0.098	0.16	0.54
95-95-4	2,4,5-Trichlorophenol	1	<0.16	U	0.095	0.16	0.54
92-52-4	1,1'-Biphenyl	1	<0.16	U	0.16	0.16	0.54
88-74-4	2-Nitroaniline	1	<0.16	U	0.11	0.16	0.54
131-11-3	Dimethylphthalate	1	<0.16	U	0.10	0.16	0.54
606-20-2	2,6-Dinitrotoluene	1	<0.16	U	0.11	0.16	0.54
99-09-2	3-Nitroaniline	1	<0.16	U	0.12	0.16	0.54
51-28-5	2,4-Dinitrophenol	1	<0.49	UQ	0.20	0.49	0.54
100-02-7	4-Nitrophenol	1	<0.16	UQ	0.13	0.16	0.54
132-64-9	Dibenzofuran	1	<0.16	U	0.11	0.16	0.54
121-14-2	2,4-Dinitrotoluene	1	<0.16	U	0.12	0.16	0.54

070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD01-0H01

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-09	File ID:	1f3012.D
Sampled:	05/15/13 10:45	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 14:33
Solids:	60.93	Preparation:	EPA 3550C_MS	Initial/Final:	30.5 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.33	U	0.12	0.33	0.54
84-66-2	Diethylphthalate	1	<0.16	U	0.12	0.16	0.54
7005-72-3	4-Chlorophenyl-phenylether	1	<0.16	U	0.11	0.16	0.54
100-01-6	4-Nitroaniline	1	<0.16	UQ	0.13	0.16	0.54
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.49	U	0.21	0.49	0.54
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.33	U	0.23	0.33	0.54
101-55-3	4-Bromophenyl-phenylether	1	<0.16	U	0.12	0.16	0.54
118-74-1	Hexachlorobenzene	1	<0.16	U	0.13	0.16	0.54
1912-24-9	Atrazine	1	<0.16	U	0.12	0.16	0.54
87-86-5	Pentachlorophenol	1	<0.49	U	0.23	0.49	0.54
86-74-8	Carbazole	1	<0.16	U	0.11	0.16	0.54
84-74-2	Di-n-butylphthalate	1	<0.16	U	0.13	0.16	0.54
85-68-7	Butylbenzylphthalate	1	<0.16	UQ	0.15	0.16	0.54
91-94-1	3,3'-Dichlorobenzidine	1	<0.16	U	0.15	0.16	0.54
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.16	U	0.14	0.16	0.54
117-84-0	Di-n-octylphthalate	1	<0.16	U	0.11	0.16	0.54

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	2.69	0.82	31	35 - 105	*
Phenol-d5	2.69	0.96	36	40 - 100	*
Nitrobenzene-d5	2.69	0.78	29	35 - 100	*
2-Fluorobiphenyl	2.69	0.61	23	45 - 105	*
2,4,6-Tribromophenol	2.69	0.94	35	35 - 125	
Terphenyl-d14	2.69	2.2	81	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	342962	6.876	376297	6.946	
Naphthalene-d8	1295962	8.443	1445935	8.527	
Acenaphthene-d10	651448	10.65	860713	10.734	
Phenanthrene-d10	928063	12.518	1334701	12.61	
Chrysene-d12	646861	16.085	771095	16.217	
Perylene-d12	389634	19.049	620417	19.175	

* Values outside of QC limits

070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-10	File ID:	1f3009.D
Sampled:	05/15/13 09:15	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 13:07
Solids:	46.92	Preparation:	EPA 3550C_MS	Initial/Final:	30.4 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.21	U UJ	0.21	0.21	0.70
108-95-2	Phenol	1	<0.21	U	0.16	0.21	0.70
111-44-4	Bis(2-chloroethyl)ether	1	<0.21	U	0.20	0.21	0.70
95-57-8	2-Chlorophenol	1	<0.21	U	0.17	0.21	0.70
95-48-7	2-Methylphenol	1	<0.21	U	0.15	0.21	0.70
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.21	U	0.17	0.21	0.70
98-86-2	Acetophenone	1	<0.21	U	0.18	0.21	0.70
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.43	U	0.34	0.43	0.70
621-64-7	N-Nitroso-di-n-propylamine	1	<0.21	U	0.19	0.21	0.70
67-72-1	Hexachloroethane	1	<0.21	U	0.16	0.21	0.70
98-95-3	Nitrobenzene	1	<0.21	U	0.17	0.21	0.70
78-59-1	Isophorone	1	<0.21	U	0.15	0.21	0.70
88-75-5	2-Nitrophenol	1	<0.21	U	0.17	0.21	0.70
105-67-9	2,4-Dimethylphenol	1	<0.21	U	0.16	0.21	0.70
111-91-1	Bis(2-chloroethoxy)methane	1	<0.21	U	0.14	0.21	0.70
120-83-2	2,4-Dichlorophenol	1	<0.21	U	0.15	0.21	0.70
106-47-8	4-Chloroaniline	1	<0.21	U	0.20	0.21	0.70
87-68-3	Hexachlorobutadiene	1	<0.21	U	0.17	0.21	0.70
105-60-2	Caprolactam	1	<0.43	U	0.21	0.43	0.70
59-50-7	4-Chloro-3-methylphenol	1	<0.21	U	0.14	0.21	0.70
77-47-4	Hexachlorocyclopentadiene	1	<0.21	U	0.20	0.21	0.70
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.21	U	0.15	0.21	0.70
88-06-2	2,4,6-Trichlorophenol	1	<0.21	U	0.13	0.21	0.70
95-95-4	2,4,5-Trichlorophenol	1	<0.21	U	0.12	0.21	0.70
92-52-4	1,1'-Biphenyl	1	<0.21	U	0.20	0.21	0.70
88-74-4	2-Nitroaniline	1	<0.21	U	0.14	0.21	0.70
131-11-3	Dimethylphthalate	1	<0.21	U	0.13	0.21	0.70
606-20-2	2,6-Dinitrotoluene	1	<0.21	U	0.15	0.21	0.70
99-09-2	3-Nitroaniline	1	<0.21	U	0.16	0.21	0.70
51-28-5	2,4-Dinitrophenol	1	<0.64	UQ	0.26	0.64	0.70
100-02-7	4-Nitrophenol	1	<0.21	UQ	0.17	0.21	0.70
132-64-9	Dibenzofuran	1	<0.21	U	0.14	0.21	0.70
121-14-2	2,4-Dinitrotoluene	1	<0.21	U	0.15	0.21	0.70

1,50L

UW 07/09/13

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-10	File ID:	1f3009.D
Sampled:	05/15/13 09:15	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 13:07
Solids:	46.92	Preparation:	EPA 3550C_MS	Initial/Final:	30.4 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.43	U	0.16	0.43	0.70
84-66-2	Diethylphthalate	1	<0.21	U	0.16	0.21	0.70
7005-72-3	4-Chlorophenyl-phenylether	1	<0.21	U	0.14	0.21	0.70
100-01-6	4-Nitroaniline	1	<0.21	UQ	0.17	0.21	0.70
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.64	U	0.28	0.64	0.70
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.43	U	0.30	0.43	0.70
101-55-3	4-Bromophenyl-phenylether	1	<0.21	U	0.16	0.21	0.70
118-74-1	Hexachlorobenzene	1	<0.21	U	0.17	0.21	0.70
1912-24-9	Atrazine	1	<0.21	U	0.16	0.21	0.70
87-86-5	Pentachlorophenol	1	<0.64	U	0.30	0.64	0.70
86-74-8	Carbazole	1	<0.21	U	0.14	0.21	0.70
84-74-2	Di-n-butylphthalate	1	<0.21	U	0.17	0.21	0.70
85-68-7	Butylbenzylphthalate	1	<0.21	UQ	0.20	0.21	0.70
91-94-1	3,3'-Dichlorobenzidine	1	<0.21	U	0.19	0.21	0.70
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.21	U	0.18	0.21	0.70
117-84-0	Di-n-octylphthalate	1	<0.21	U	0.14	0.21	0.70

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%SOL

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	3.51	1.5	42	35 - 105	
Phenol-d5	3.51	1.6	45	40 - 100	
Nitrobenzene-d5	3.51	1.1	32	35 - 100	*
2-Fluorobiphenyl	3.51	0.93	26	45 - 105	*
2,4,6-Tribromophenol	3.51	1.6	44	35 - 125	
Terphenyl-d14	3.51	2.6	74	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	284978	6.876	376297	6.946	
Naphthalene-d8	1015412	8.443	1445935	8.527	
Acenaphthene-d10	504524	10.65	860713	10.734	
Phenanthrene-d10	808654	12.518	1334701	12.61	
Chrysene-d12	607373	16.096	771095	16.217	
Perylene-d12	436093	19.048	620417	19.175	

* Values outside of QC limits

070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD03-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-11	File ID:	1f3013.D
Sampled:	05/15/13 08:15	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 15:01
Solids:	46.15	Preparation:	EPA 3550C_MS	Initial/Final:	30.3 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.22	U	0.21	0.22	0.72
108-95-2	Phenol	1	<0.22	U	0.16	0.22	0.72
111-44-4	Bis(2-chloroethyl)ether	1	<0.22	U	0.20	0.22	0.72
95-57-8	2-Chlorophenol	1	<0.22	U	0.18	0.22	0.72
95-48-7	2-Methylphenol	1	<0.22	U	0.15	0.22	0.72
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.22	U	0.18	0.22	0.72
98-86-2	Acetophenone	1	<0.22	U	0.18	0.22	0.72
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.43	U	0.35	0.43	0.72
621-64-7	N-Nitroso-di-n-propylamine	1	<0.22	U	0.20	0.22	0.72
67-72-1	Hexachloroethane	1	<0.22	U	0.16	0.22	0.72
98-95-3	Nitrobenzene	1	<0.22	U	0.17	0.22	0.72
78-59-1	Isophorone	1	<0.22	U	0.16	0.22	0.72
88-75-5	2-Nitrophenol	1	<0.22	U	0.17	0.22	0.72
105-67-9	2,4-Dimethylphenol	1	<0.22	U	0.16	0.22	0.72
111-91-1	Bis(2-chloroethoxy)methane	1	<0.22	U	0.14	0.22	0.72
120-83-2	2,4-Dichlorophenol	1	<0.22	U	0.15	0.22	0.72
106-47-8	4-Chloroaniline	1	<0.22	U	0.20	0.22	0.72
87-68-3	Hexachlorobutadiene	1	<0.22	U	0.17	0.22	0.72
105-60-2	Caprolactam	1	<0.43	U	0.22	0.43	0.72
59-50-7	4-Chloro-3-methylphenol	1	<0.22	U	0.15	0.22	0.72
77-47-4	Hexachlorocyclopentadiene	1	<0.22	U	0.20	0.22	0.72
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.22	U	0.15	0.22	0.72
88-06-2	2,4,6-Trichlorophenol	1	<0.22	U	0.13	0.22	0.72
95-95-4	2,4,5-Trichlorophenol	1	<0.22	U	0.13	0.22	0.72
92-52-4	1,1'-Biphenyl	1	<0.22	U	0.21	0.22	0.72
88-74-4	2-Nitroaniline	1	<0.22	U	0.15	0.22	0.72
131-11-3	Dimethylphthalate	1	<0.22	U	0.13	0.22	0.72
606-20-2	2,6-Dinitrotoluene	1	<0.22	U	0.15	0.22	0.72
99-09-2	3-Nitroaniline	1	<0.22	U	0.16	0.22	0.72
51-28-5	2,4-Dinitrophenol	1	<0.65	UQ	0.26	0.65	0.72
100-02-7	4-Nitrophenol	1	<0.22	UQ	0.18	0.22	0.72
132-64-9	Dibenzofuran	1	<0.22	U	0.14	0.22	0.72
121-14-2	2,4-Dinitrotoluene	1	<0.22	U	0.16	0.22	0.72

1/SOL

070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD03-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-11	File ID:	1f3013.D
Sampled:	05/15/13 08:15	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 15:01
Solids:	46.15	Preparation:	EPA 3550C_MS	Initial/Final:	30.3 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.43	U V3	0.16	0.43	0.72
84-66-2	Diethylphthalate	1	<0.22	U	0.16	0.22	0.72
7005-72-3	4-Chlorophenyl-phenylether	1	<0.22	U	0.15	0.22	0.72
100-01-6	4-Nitroaniline	1	<0.22	UQ	0.18	0.22	0.72
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.65	U	0.28	0.65	0.72
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.43	U	0.30	0.43	0.72
101-55-3	4-Bromophenyl-phenylether	1	<0.22	U	0.16	0.22	0.72
118-74-1	Hexachlorobenzene	1	<0.22	U	0.18	0.22	0.72
1912-24-9	Atrazine	1	<0.22	U	0.16	0.22	0.72
87-86-5	Pentachlorophenol	1	<0.65	U	0.30	0.65	0.72
86-74-8	Carbazole	1	<0.22	U	0.15	0.22	0.72
84-74-2	Di-n-butylphthalate	1	<0.22	U	0.17	0.22	0.72
85-68-7	Butylbenzylphthalate	1	<0.22	UQ	0.20	0.22	0.72
91-94-1	3,3'-Dichlorobenzidine	1	<0.22	U	0.20	0.22	0.72
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.22	U	0.18	0.22	0.72
117-84-0	Di-n-octylphthalate	1	<0.22	U	0.15	0.22	0.72

7.SOL

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	3.58	1.6	44	35 - 105	
Phenol-d5	3.58	1.9	53	40 - 100	
Nitrobenzene-d5	3.58	1.2	35	35 - 100	
2-Fluorobiphenyl	3.58	0.90	25	45 - 105	*
2,4,6-Tribromophenol	3.58	1.9	52	35 - 125	
Terphenyl-d14	3.58	2.7	77	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	314548	6.876	376297	6.946	
Naphthalene-d8	1158933	8.443	1445935	8.527	
Acenaphthene-d10	630385	10.65	860713	10.734	
Phenanthrene-d10	1033071	12.529	1334701	12.61	
Chrysene-d12	734088	16.096	771095	16.217	
Perylene-d12	495224	19.048	620417	19.175	

* Values outside of QC limits

070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD12-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-12	File ID:	1f3014.D
Sampled:	05/15/13 08:30	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 15:32
Solids:	39.13	Preparation:	EPA 3550C_MS	Initial/Final:	30.2 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.26	U	0.25	0.26	0.84
108-95-2	Phenol	1	<0.26	U	0.19	0.26	0.84
111-44-4	Bis(2-chloroethyl)ether	1	<0.26	U	0.24	0.26	0.84
95-57-8	2-Chlorophenol	1	<0.26	U	0.21	0.26	0.84
95-48-7	2-Methylphenol	1	<0.26	U	0.18	0.26	0.84
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.26	U	0.21	0.26	0.84
98-86-2	Acetophenone	1	<0.26	U	0.21	0.26	0.84
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.51	U	0.41	0.51	0.84
621-64-7	N-Nitroso-di-n-propylamine	1	<0.26	U	0.23	0.26	0.84
67-72-1	Hexachloroethane	1	<0.26	U	0.19	0.26	0.84
98-95-3	Nitrobenzene	1	<0.26	U	0.20	0.26	0.84
78-59-1	Isophorone	1	<0.26	U	0.18	0.26	0.84
88-75-5	2-Nitrophenol	1	<0.26	U	0.20	0.26	0.84
105-67-9	2,4-Dimethylphenol	1	<0.26	U	0.19	0.26	0.84
111-91-1	Bis(2-chloroethoxy)methane	1	<0.26	U	0.16	0.26	0.84
120-83-2	2,4-Dichlorophenol	1	<0.26	U	0.18	0.26	0.84
106-47-8	4-Chloroaniline	1	<0.26	U	0.24	0.26	0.84
87-68-3	Hexachlorobutadiene	1	<0.26	U	0.20	0.26	0.84
105-60-2	Caprolactam	1	<0.51	U	0.26	0.51	0.84
59-50-7	4-Chloro-3-methylphenol	1	<0.26	U	0.17	0.26	0.84
77-47-4	Hexachlorocyclopentadiene	1	<0.26	U	0.24	0.26	0.84
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.26	U	0.18	0.26	0.84
88-06-2	2,4,6-Trichlorophenol	1	<0.26	U	0.15	0.26	0.84
95-95-4	2,4,5-Trichlorophenol	1	<0.26	U	0.15	0.26	0.84
92-52-4	1,1'-Biphenyl	1	<0.26	U	0.24	0.26	0.84
88-74-4	2-Nitroaniline	1	<0.26	U	0.17	0.26	0.84
131-11-3	Dimethylphthalate	1	<0.26	U	0.16	0.26	0.84
606-20-2	2,6-Dinitrotoluene	1	<0.26	U	0.18	0.26	0.84
99-09-2	3-Nitroaniline	1	<0.26	U	0.19	0.26	0.84
51-28-5	2,4-Dinitrophenol	1	<0.77	UQ	0.31	0.77	0.84
100-02-7	4-Nitrophenol	1	<0.26	UQ	0.21	0.26	0.84
132-64-9	Dibenzofuran	1	<0.26	U	0.17	0.26	0.84
121-14-2	2,4-Dinitrotoluene	1	<0.26	U	0.18	0.26	0.84

070913

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ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD12-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-12	File ID:	1f3014.D
Sampled:	05/15/13 08:30	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 15:32
Solids:	39.13	Preparation:	EPA 3550C MS	Initial/Final:	30.2 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.51	U	0.19	0.51	0.84
84-66-2	Diethylphthalate	1	<0.26	U	0.19	0.26	0.84
7005-72-3	4-Chlorophenyl-phenylether	1	<0.26	U	0.17	0.26	0.84
100-01-6	4-Nitroaniline	1	<0.26	UQ	0.21	0.26	0.84
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.77	U	0.33	0.77	0.84
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.51	U	0.36	0.51	0.84
101-55-3	4-Bromophenyl-phenylether	1	<0.26	U	0.19	0.26	0.84
118-74-1	Hexachlorobenzene	1	<0.26	U	0.21	0.26	0.84
1912-24-9	Atrazine	1	<0.26	U	0.19	0.26	0.84
87-86-5	Pentachlorophenol	1	<0.77	U	0.36	0.77	0.84
86-74-8	Carbazole	1	<0.26	U	0.17	0.26	0.84
84-74-2	Di-n-butylphthalate	1	<0.26	U	0.20	0.26	0.84
85-68-7	Butylbenzylphthalate	1	<0.26	UQ	0.24	0.26	0.84
91-94-1	3,3'-Dichlorobenzidine	1	<0.26	U	0.23	0.26	0.84
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.26	U	0.22	0.26	0.84
117-84-0	Di-n-octylphthalate	1	<0.26	U	0.17	0.26	0.84

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	4.23	1.3	32	35 - 105	*
Phenol-d5	4.23	1.5	35	40 - 100	*
Nitrobenzene-d5	4.23	1.2	27	35 - 100	*
2-Fluorobiphenyl	4.23	0.89	21	45 - 105	*
2,4,6-Tribromophenol	4.23	1.2	29	35 - 125	*
Terphenyl-d14	4.23	2.2	52	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	360481	6.876	376297	6.946	
Naphthalene-d8	1342625	8.453	1445935	8.527	
Acenaphthene-d10	711879	10.65	860713	10.734	
Phenanthrene-d10	1147696	12.529	1334701	12.61	
Chrysene-d12	787513	16.096	771095	16.217	
Perylene-d12	489206	19.048	620417	19.175	

* Values outside of QC limits

070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD02-0H01

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-13	File ID:	1f3015.D
Sampled:	05/15/13 10:00	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 16:01
Solids:	54.91	Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.18	U	0.18	0.18	0.60
108-95-2	Phenol	1	<0.18	U	0.14	0.18	0.60
111-44-4	Bis(2-chloroethyl)ether	1	<0.18	U	0.17	0.18	0.60
95-57-8	2-Chlorophenol	1	<0.18	U	0.15	0.18	0.60
95-48-7	2-Methylphenol	1	<0.18	U	0.13	0.18	0.60
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.18	U	0.15	0.18	0.60
98-86-2	Acetophenone	1	<0.18	U	0.15	0.18	0.60
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.36	U	0.29	0.36	0.60
621-64-7	N-Nitroso-di-n-propylamine	1	<0.18	U	0.16	0.18	0.60
67-72-1	Hexachloroethane	1	<0.18	U	0.13	0.18	0.60
98-95-3	Nitrobenzene	1	<0.18	U	0.14	0.18	0.60
78-59-1	Isophorone	1	<0.18	U	0.13	0.18	0.60
88-75-5	2-Nitrophenol	1	<0.18	U	0.14	0.18	0.60
105-67-9	2,4-Dimethylphenol	1	<0.18	U	0.13	0.18	0.60
111-91-1	Bis(2-chloroethoxy)methane	1	<0.18	U	0.12	0.18	0.60
120-83-2	2,4-Dichlorophenol	1	<0.18	U	0.13	0.18	0.60
106-47-8	4-Chloroaniline	1	<0.18	U	0.17	0.18	0.60
87-68-3	Hexachlorobutadiene	1	<0.18	U	0.15	0.18	0.60
105-60-2	Caprolactam	1	<0.36	U	0.18	0.36	0.60
59-50-7	4-Chloro-3-methylphenol	1	<0.18	U	0.12	0.18	0.60
77-47-4	Hexachlorocyclopentadiene	1	<0.18	U	0.17	0.18	0.60
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.18	U	0.13	0.18	0.60
88-06-2	2,4,6-Trichlorophenol	1	<0.18	U	0.11	0.18	0.60
95-95-4	2,4,5-Trichlorophenol	1	<0.18	U	0.11	0.18	0.60
92-52-4	1,1'-Biphenyl	1	<0.18	U	0.17	0.18	0.60
88-74-4	2-Nitroaniline	1	<0.18	U	0.12	0.18	0.60
131-11-3	Dimethylphthalate	1	<0.18	U	0.11	0.18	0.60
606-20-2	2,6-Dinitrotoluene	1	<0.18	U	0.13	0.18	0.60
99-09-2	3-Nitroaniline	1	<0.18	U	0.13	0.18	0.60
51-28-5	2,4-Dinitrophenol	1	<0.55	UQ	0.22	0.55	0.60
100-02-7	4-Nitrophenol	1	<0.18	UQ	0.15	0.18	0.60
132-64-9	Dibenzofuran	1	<0.18	U	0.12	0.18	0.60
121-14-2	2,4-Dinitrotoluene	1	<0.18	U	0.13	0.18	0.60

046

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD02-0H01

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-13	File ID:	1f3015.D
Sampled:	05/15/13 10:00	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 16:01
Solids:	54.91	Preparation:	EPA 3550C MS	Initial/Final:	30 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.36	U UJ	0.13	0.36	0.60
84-66-2	Diethylphthalate	1	<0.18	U	0.14	0.18	0.60
7005-72-3	4-Chlorophenyl-phenylether	1	<0.18	U	0.12	0.18	0.60
100-01-6	4-Nitroaniline	1	<0.18	UQ	0.15	0.18	0.60
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.55	U	0.24	0.55	0.60
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.36	U	0.25	0.36	0.60
101-55-3	4-Bromophenyl-phenylether	1	<0.18	U	0.13	0.18	0.60
118-74-1	Hexachlorobenzene	1	<0.18	U	0.15	0.18	0.60
1912-24-9	Atrazine	1	<0.18	U	0.13	0.18	0.60
87-86-5	Pentachlorophenol	1	<0.55	U	0.25	0.55	0.60
86-74-8	Carbazole	1	<0.18	U	0.12	0.18	0.60
84-74-2	Di-n-butylphthalate	1	<0.18	U	0.14	0.18	0.60
85-68-7	Butylbenzylphthalate	1	<0.18	UQ	0.17	0.18	0.60
91-94-1	3,3'-Dichlorobenzidine	1	<0.18	U	0.17	0.18	0.60
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.18	U	0.15	0.18	0.60
117-84-0	Di-n-octylphthalate	1	<0.18	U	0.12	0.18	0.60

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	3.04	0.95	31	35 - 105	*
Phenol-d5	3.04	1.1	35	40 - 100	*
Nitrobenzene-d5	3.04	0.92	30	35 - 100	*
2-Fluorobiphenyl	3.04	0.87	29	45 - 105	*
2,4,6-Tribromophenol	3.04	1.1	38	35 - 125	
Terphenyl-d14	3.04	2.0	66	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	395975	6.876	376297	6.946	
Naphthalene-d8	1464452	8.443	1445935	8.527	
Acenaphthene-d10	768399	10.65	860713	10.734	
Phenanthrene-d10	1244425	12.529	1334701	12.61	
Chrysene-d12	834413	16.096	771095	16.217	
Perylene-d12	503141	19.048	620417	19.175	

* Values outside of QC limits

070913

047

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-EB01-051513-SD

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302428-14	File ID:	1f5008.D
Sampled:	05/15/13 07:00	Prepared:	05/22/13 01:30	Analyzed:	06/05/13 14:06
Solids:		Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

Batch: 3E22001 Sequence: AA24423 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<6.0	UQ	5.4	6.0	10
108-95-2	Phenol	1	<3.0	U	1.4	3.0	10
111-44-4	Bis(2-chloroethyl)ether	1	<6.0	U	3.2	6.0	10
95-57-8	2-Chlorophenol	1	<6.0	U	2.8	6.0	10
95-48-7	2-Methylphenol	1	<3.0	U	2.3	3.0	10
108-60-1	Bis(2-chloroisopropyl)ether	1	<6.0	U	3.1	6.0	10
98-86-2	Acetophenone	1	<3.0	U	3.0	3.0	10
108-39-4/106-44-5	3 & 4-Methylphenol	1	<6.0	U	4.5	6.0	10
621-64-7	N-Nitroso-di-n-propylamine	1	<6.0	U	3.4	6.0	10
67-72-1	Hexachloroethane	1	<3.0	U	2.9	3.0	10
98-95-3	Nitrobenzene	1	<6.0	U	3.1	6.0	10
78-59-1	Isophorone	1	<3.0	U	2.9	3.0	10
88-75-5	2-Nitrophenol	1	<6.0	U	3.1	6.0	10
105-67-9	2,4-Dimethylphenol	1	<6.0	U	2.7	6.0	10
111-91-1	Bis(2-chloroethoxy)methane	1	<6.0	U	2.7	6.0	10
120-83-2	2,4-Dichlorophenol	1	<6.0	U	3.3	6.0	10
106-47-8	4-Chloroaniline	1	<6.0	U	2.7	6.0	10
87-68-3	Hexachlorobutadiene	1	<6.0	U	3.6	6.0	10
105-60-2	Caprolactam	1	<3.0	U	2.7	3.0	10
59-50-7	4-Chloro-3-methylphenol	1	<6.0	U	2.6	6.0	10
77-47-4	Hexachlorocyclopentadiene	1	<6.0	U	3.8	6.0	10
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<6.0	U	3.2	6.0	10
88-06-2	2,4,6-Trichlorophenol	1	<6.0	U	3.7	6.0	10
95-95-4	2,4,5-Trichlorophenol	1	<6.0	U	3.6	6.0	10
92-52-4	1,1'-Biphenyl	1	<9.0	U	7.0	9.0	10
88-74-4	2-Nitroaniline	1	<3.0	U	2.8	3.0	10
131-11-3	Dimethylphthalate	1	<3.0	U	2.9	3.0	10
606-20-2	2,6-Dinitrotoluene	1	<3.0	U	2.7	3.0	10
99-09-2	3-Nitroaniline	1	<3.0	U	2.8	3.0	10
51-28-5	2,4-Dinitrophenol	1	<6.0	~~U~~ UJ	5.2	6.0	10 ICH
100-02-7	4-Nitrophenol	1	<3.0	UQ	2.3	3.0	10
132-64-9	Dibenzofuran	1	<3.0	U	2.8	3.0	10
121-14-2	2,4-Dinitrotoluene	1	<6.0	U	2.8	6.0	10

070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-EB01-051513-SD

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302428-14	File ID:	1f5008.D
Sampled:	05/15/13 07:00	Prepared:	05/22/13 01:30	Analyzed:	06/05/13 14:06
Solids:		Preparation:	EPA 3510C MS	Initial/Final:	500 mL / 0.5 mL

Batch: 3E22001 Sequence: AA24423 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<6.0	UQ	4.7	6.0	10
84-66-2	Diethylphthalate	1	<3.0	U	3.0	3.0	10
7005-72-3	4-Chlorophenyl-phenylether	1	<6.0	U	3.2	6.0	10
100-01-6	4-Nitroaniline	1	<3.0	~~U~~ VJ	2.7	3.0	10 CCH
534-52-1	2-Methyl-4,6-dinitrophenol	1	<6.0	~~U~~ VJ	6.0	6.0	10 ICH
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<6.0	U	5.4	6.0	10
101-55-3	4-Bromophenyl-phenylether	1	<6.0	U	3.3	6.0	10
118-74-1	Hexachlorobenzene	1	<3.0	U	3.0	3.0	10
1912-24-9	Atrazine	1	<3.0	UQ	2.9	3.0	10
87-86-5	Pentachlorophenol	1	<9.0	U	6.3	9.0	10
86-74-8	Carbazole	1	<3.0	U	2.5	3.0	10
84-74-2	Di-n-butylphthalate	1	<3.0	U	2.7	3.0	10
85-68-7	Butylbenzylphthalate	1	<3.0	U	2.8	3.0	10
91-94-1	3,3'-Dichlorobenzidine	1	<6.0	U	3.2	6.0	10
117-81-7	Bis(2-ethylhexyl)phthalate	1	<6.0	U	3.5	6.0	10
117-84-0	Di-n-octylphthalate	1	<6.0	U	3.4	6.0	10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	50.0	22	45	20 - 110	
Phenol-d5	50.0	15	29	10 - 115	
Nitrobenzene-d5	50.0	37	73	40 - 110	
2-Fluorobiphenyl	50.0	35	70	50 - 110	
2,4,6-Tribromophenol	50.0	38	77	40 - 125	
Terphenyl-d14	50.0	52	104	50 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	266220	6.846	376297	6.946	
Naphthalene-d8	946570	8.415	1445935	8.527	
Acenaphthene-d10	552133	10.622	860713	10.734	
Phenanthrene-d10	936038	12.483	1334701	12.61	
Chrysene-d12	587150	16.041	771095	16.217	
Perylene-d12	415629	18.981	620417	19.175	

* Values outside of QC limits

070913

049

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SS01-0002

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Soil	Laboratory ID:	A302428-01	File ID:	2F4024.D
Sampled:	05/14/13 09:30	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 14:46
Solids:	76.21	Preparation:	EPA 3550C	Initial/Final:	30.2 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	<0.0013	U	0.00068	0.0013	0.0022
72-54-8	4,4'-DDD	1	<0.0013	U	0.00063	0.0013	0.0022
50-29-3	4,4'-DDT	1	<0.0013	UJ Y CCL	0.00087	0.0013	0.0022

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0434	0.035	82	70 - 125	
2,4,5,6-TCMX [2C]	0.0434	0.031	72	70 - 125	
Decachlorobiphenyl	0.0434	0.032	73	55 - 130	
Decachlorobiphenyl [2C]	0.0434	0.027	63	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	532700000	5.484	3.764E+08	5.31	
DBC [2C]	350900000	5.389	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SS01P-0002

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Soil	Laboratory ID:	A302428-02	File ID:	2F4025.D
Sampled:	05/14/13 09:30	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 14:58
Solids:	76.28	Preparation:	EPA 3550C	Initial/Final:	30.3 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	<0.0013	UJ U SL	0.00068	0.0013	0.0022
72-54-8	4,4'-DDD	1	<0.0013	U	0.00063	0.0013	0.0022
50-29-3	4,4'-DDT	1	<0.0013	U	0.00087	0.0013	0.0022

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0433	0.030	68	70 - 125	*
2,4,5,6-TCMX [2C]	0.0433	0.027	62	70 - 125	*
Decachlorobiphenyl	0.0433	0.030	69	55 - 130	
Decachlorobiphenyl [2C]	0.0433	0.025	57	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	499500000	5.482	3.764E+08	5.31	
DBC [2C]	327800000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SS04-0001

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Soil	Laboratory ID:	A302428-03	File ID:	2F4026.D
Sampled:	05/14/13 11:00	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 15:10
Solids:	67.30	Preparation:	EPA 3550C	Initial/Final:	30 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	<0.0015	20 U 35L	0.00077	0.0015	0.0025
72-54-8	4,4'-DDD	1	<0.0015	U	0.00071	0.0015	0.0025
50-29-3	4,4'-DDT	1	<0.0015	U	0.00098	0.0015	0.0025

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0495	0.032	64	70 - 125	*
2,4,5,6-TCMX [2C]	0.0495	0.029	59	70 - 125	*
Decachlorobiphenyl	0.0495	0.039	79	55 - 130	
Decachlorobiphenyl [2C]	0.0495	0.033	66	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	479800000	5.482	3.764E+08	5.31	
DBC [2C]	317200000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SS05-0002

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Soil	Laboratory ID:	A302428-04	File ID:	2F4027.D
Sampled:	05/14/13 10:30	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 15:22
Solids:	93.37	Preparation:	EPA 3550C	Initial/Final:	30.1 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	100	2.3	D	0.056	0.11	0.18
72-54-8	4,4'-DDD	100	0.11 ~~0.078~~*	u ~~IDQ~~ 2C	0.051	0.11	0.18
50-29-3	4,4'-DDT	100	<0.11	UJ ~~UD~~ CC	0.071	0.11	0.18

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0356	ND		70 - 125	D
2,4,5,6-TCMX [2C]	0.0356	ND		70 - 125	D
Decachlorobiphenyl	0.0356	ND		55 - 130	D
Decachlorobiphenyl [2C]	0.0356	ND		55 - 130	D

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	536500000	5.482	3.764E+08	5.31	
DBC [2C]	345900000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SS07-0002

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Soil	Laboratory ID:	A302428-05	File ID:	2F4028.D
Sampled:	05/14/13 13:30	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 15:34
Solids:	93.75	Preparation:	EPA 3550C	Initial/Final:	30.1 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	<0.0021	UJ	0.0011	0.0021	0.0036
72-54-8	4,4'-DDD	2	<0.0021	UJ	0.0010	0.0021	0.0036
50-29-3	4,4'-DDT	2	<0.0021	UJ CCL	0.0014	0.0021	0.0036

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0354	0.028	78	70 - 125	
2,4,5,6-TCMX [2C]	0.0354	0.026	73	70 - 125	
Decachlorobiphenyl	0.0354	0.027	75	55 - 130	
Decachlorobiphenyl [2C]	0.0354	0.025	71	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	516100000	5.482	3.764E+08	5.31	
DBC [2C]	312000000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-EB01-051413-SS

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302428-06	File ID:	2F4019.D
Sampled:	05/14/13 08:35	Prepared:	05/20/13 13:30	Analyzed:	06/04/13 13:45
Solids:		Preparation:	EPA 3510C	Initial/Final:	500 mL / 5 mL

Batch: 3E20028 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	<0.050	U	0.023	0.050	0.10
72-54-8	4,4'-DDD	1	<0.050	U	0.023	0.050	0.10
50-29-3	4,4'-DDT	1	<0.050	UJ/ CCL	0.024	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.72	72	25 - 140	
2,4,5,6-TCMX [2C]	1.00	0.65	65	25 - 140	
Decachlorobiphenyl	1.00	0.62	62	30 - 135	
Decachlorobiphenyl [2C]	1.00	0.54	54	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	516900000	5.482	3.764E+08	5.31	
DBC [2C]	337900000	5.389	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13

JAC 2013

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD01-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-07	File ID:	2F4029.D
Sampled:	05/15/13 10:30	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 15:46
Solids:	54.93	Preparation:	EPA 3550C	Initial/Final:	30.4 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	0.011	J ~~D~~ FD	0.0019	0.0036	0.0062
72-54-8	4,4'-DDD	2	0.0084	J ~~D~~ FD	0.0017	0.0036	0.0062
50-29-3	4,4'-DDT	2	0.0032	J ~~D~~ ul	0.0024	0.0036	0.0062

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0599	0.040	66	70 - 125	✓
2,4,5,6-TCMX [2C]	0.0599	0.045	75	70 - 125	
Decachlorobiphenyl	0.0599	0.043	72	55 - 130	
Decachlorobiphenyl [2C]	0.0599	0.036	60	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	529400000	5.481	3.764E+08	5.31	
DBC [2C]	370700000	5.387	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13 JAC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD01P-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-08	File ID:	2F4030.D
Sampled:	05/15/13 10:30	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 15:58
Solids:	55.28	Preparation:	EPA 3550C	Initial/Final:	30 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	0.016	J D SSL	0.0019	0.0036	0.0062
72-54-8	4,4'-DDD	2	0.015	D	0.0017	0.0036	0.0062
50-29-3	4,4'-DDT	2	0.0088	D	0.0024	0.0036	0.0062

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0603	0.040	66	70 - 125	*
2,4,5,6-TCMX [2C]	0.0603	0.037	62	70 - 125	*
Decachlorobiphenyl	0.0603	0.043	71	55 - 130	
Decachlorobiphenyl [2C]	0.0603	0.036	60	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	513700000	5.482	3.764E+08	5.31	
DBC [2C]	378100000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD01-0H01

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-09	File ID:	2F4031.D
Sampled:	05/15/13 10:45	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 16:11
Solids:	60.93	Preparation:	EPA 3550C	Initial/Final:	30 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	0.041	J D SSL	0.0017	0.0033	0.0056
72-54-8	4,4'-DDD	2	0.14	D	0.0016	0.0033	0.0056
50-29-3	4,4'-DDT	2	0.21	D	0.0022	0.0033	0.0056

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0547	0.033	60	70 - 125	*
2,4,5,6-TCMX [2C]	0.0547	0.029	54	70 - 125	*
Decachlorobiphenyl	0.0547	0.036	66	55 - 130	
Decachlorobiphenyl [2C]	0.0547	0.031	56	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	539800000	5.482	3.764E+08	5.31	
DBC [2C]	362900000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-10	File ID:	2F4015.D
Sampled:	05/15/13 09:15	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 12:57
Solids:	46.92	Preparation:	EPA 3550C	Initial/Final:	30.2 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	0.017	J ~~Q~~ SSL	0.0011	0.0021	0.0036
72-54-8	4,4'-DDD	1	0.0071		0.0010	0.0021	0.0036
50-29-3	4,4'-DDT	1	0.0037	~~Q~~	0.0014	0.0021	0.0036

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0706	0.047	66	70 - 125	*
2,4,5,6-TCMX [2C]	0.0706	0.043	61	70 - 125	*
Decachlorobiphenyl	0.0706	0.052	73	55 - 130	
Decachlorobiphenyl [2C]	0.0706	0.045	64	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	509900000	5.481	3.764E+08	5.31	
DBC [2C]	331900000	5.387	2.1E+08	5.22	

* Values outside of QC limits

JLC
7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-10RE1	File ID:	2FB021.D
Sampled:	05/15/13 09:15	Prepared:	06/03/13 00:44	Analyzed:	06/07/13 14:11
Solids:	46.92	Preparation:	EPA 3550C	Initial/Final:	30.3 g / 10 mL

Batch: 3F03003 Sequence: AA24452 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	0.012	~~DQ~~	0.0022	0.0043	0.0072
72-54-8	4,4'-DDD	2	0.0055	~~JDQ~~	0.0020	0.0043	0.0072
50-29-3	4,4'-DDT	2	<0.0043	~~UDQ~~	0.0028	0.0043	0.0072

exclude/RE

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0703	0.029	41	70 - 125	*
2,4,5,6-TCMX [2C]	0.0703	0.029	41	70 - 125	*
Decachlorobiphenyl	0.0703	0.037	53	55 - 130	*
Decachlorobiphenyl [2C]	0.0703	0.033	47	55 - 130	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	740200000	5.458	3.764E+08	5.31	
DBC [2C]	450500000	5.359	2.1E+08	5.22	*

* Values outside of QC limits

JC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD03-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-11	File ID:	2F4032.D
Sampled:	05/15/13 08:15	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 16:23
Solids:	46.15	Preparation:	EPA 3550C	Initial/Final:	30.5 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	0.017	J D SSL	0.0023	0.0043	0.0074
72-54-8	4,4'-DDD	2	0.076	D	0.0021	0.0043	0.0074
50-29-3	4,4'-DDT	2	0.054	D	0.0029	0.0043	0.0074

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0710	0.038	53	70 - 125	*
2,4,5,6-TCMX [2C]	0.0710	0.035	49	70 - 125	*
Decachlorobiphenyl	0.0710	0.046	65	55 - 130	
Decachlorobiphenyl [2C]	0.0710	0.042	59	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	564200000	5.482	3.764E+08	5.31	
DBC [2C]	366900000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD12-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-12	File ID:	2F4033.D
Sampled:	05/15/13 08:30	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 16:35
Solids:	39.13	Preparation:	EPA 3550C	Initial/Final:	30.4 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	0.014	J ~~D~~ SSL	0.0027	0.0051	0.0087
72-54-8	4,4'-DDD [2C]	2	0.0040	~~JDQ~~	0.0025	0.0051	0.0087
50-29-3	4,4'-DDT	2	0.0040	~~JD~~	0.0034	0.0051	0.0087

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0841	0.043	51	70 - 125	*
2,4,5,6-TCMX [2C]	0.0841	0.041	49	70 - 125	*
Decachlorobiphenyl	0.0841	0.054	65	55 - 130	
Decachlorobiphenyl [2C]	0.0841	0.044	53	55 - 130	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	529200000	5.481	3.764E+08	5.31	
DBC [2C]	351700000	5.387	2.1E+08	5.22	

* Values outside of QC limits

JLC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD02-0H01

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-13	File ID:	2F4034.D
Sampled:	05/15/13 10:00	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 16:47
Solids:	54.91	Preparation:	EPA 3550C	Initial/Final:	30 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	0.014	J ~~D~~ SSL	0.0019	0.0036	0.0062
72-54-8	4,4'-DDD	2	<0.0036	UJ ~~UD~~	0.0017	0.0036	0.0062
50-29-3	4,4'-DDT	2	<0.0036	UJ ~~UD~~	0.0024	0.0036	0.0062

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0607	0.032	53	70 - 125	*
2,4,5,6-TCMX [2C]	0.0607	0.029	48	70 - 125	*
Decachlorobiphenyl	0.0607	0.041	68	55 - 130	
Decachlorobiphenyl [2C]	0.0607	0.035	57	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	532500000	5.482	3.764E+08	5.31	
DBC [2C]	351500000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC 4/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-EB01-051513-SD

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302428-14	File ID:	2F4020.D
Sampled:	05/15/13 07:00	Prepared:	05/20/13 13:30	Analyzed:	06/04/13 13:57
Solids:		Preparation:	EPA 3510C	Initial/Final:	500 mL / 5 mL

Batch: 3E20028 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	<0.050	U	0.023	0.050	0.10
72-54-8	4,4'-DDD	1	<0.050	U	0.023	0.050	0.10
50-29-3	4,4'-DDT	1	<0.050	U ~~J~~ CCL	0.024	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.71	71	25 - 140	
2,4,5,6-TCMX [2C]	1.00	0.65	65	25 - 140	
Decachlorobiphenyl	1.00	0.81	81	30 - 135	
Decachlorobiphenyl [2C]	1.00	0.71	71	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	595200000	5.482	3.764E+08	5.31	
DBC [2C]	383400000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13 JAC 7/2/13

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PROJECT NARRATIVE

Client: CH2M Hill, Inc.
Project: East Vieques La Chiva SWMU 1, CTO-0037
Project Number: 408040
ENCO Project ID: A302428
SDG: A302428-CTO0037

Overview

All samples submitted were analyzed by Environmental Conservation Laboratories, Inc. in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling and processing will be discussed in the Remarks section below.

Remarks

Analytical and Preparation Method/ SOP Reference	Instrument
EPA 8260B	OVGCMS2/ OVGCMS3
EPA 8270D	OSVGCMS1
EPA 8081B	OSVGCECD2
EPA 9045D	OWETSPH1
Walkley Black	Titration

Analysis: EPA 8260B
Sequence: AA22766
Affected Sample(s): AA22766-ICB1, AA22766-CAL1, AA22766-CAL2, AA22766-CAL3, AA22766-CAL4, AA22766-CAL5, AA22766-CAL6, AA22766-SCV1, AA22766-SCV2
Nonconformance: Manual integrations
Additional Information: The following manual integrations were performed in the sample(s) AA22766-ICB1, AA22766-CAL6 due to ISTD reintegration: 1,4- Difluorobenzene.
The following manual integrations were performed in the sample(s) AA22766-CAL1 due to ISTD reintegration: Pentafluorobenzene, 1,4- Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) AA22766-CAL1 due to poor integration (peak tailing, baseline selection): Methyl Cyclohexane, Carbon Tetrachloride, Benzene, 1,2-Dichloropropane, 1,4-Dioxane, 2-Chloroethyl vinyl ether, 1,1,2,2-Tetrachloroethane.
The following manual integrations were performed in the sample(s) AA22766-CAL1 due to incorrect peak selection/peak not found: 1,4-Dioxane.
The following manual integrations were performed in the sample(s) AA22766-CAL2 due to poor integration (peak tailing, baseline selection): Chloroethane, Acetone, Carbon Tetrachloride, 2-Chloroethyl vinyl ether, CHlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA22766-CAL2 due to ISTD reintegration: Chlorobenzene-d5, 1,4- Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) AA22766-CAL3 due to poor integration (peak tailing, baseline selection): Bromomethane, 1,2-Dichloroethane, 2-Chloroethyl vinyl ether, Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA22766-CAL3 due to ISTD reintegration: Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA22766-CAL4 due to poor integration (peak tailing, baseline selection): Bromomethane, Chloroethane, Methyl tert-butyl ether, 1,4-Dichlorobenzene-d4, 2-Chloroethyl vinyl ether.
The following manual integrations were performed in the sample(s) AA22766-CAL5, AA22766-SCV2 due to ISTD reintegration: Pentafluorobenzene.

The following manual integrations were performed in the sample(s) AA22766-CAL5 due to poor integration (peak tailing, baseline selection): 2-Chloroethyl vinyl ether.
The following manual integrations were performed in the sample(s) AA22766-CAL6 due to poor integration (peak tailing, baseline selection): Acetone, 2-Butanone.
The following manual integrations were performed in the sample(s) AA22766-SCV1 due to ISTD reintegration: Pentafluorobenzene, 1,4-Difluorobenzene.
The following manual integrations were performed in the sample(s) AA22766-SCV1 due to poor integration (peak tailing, baseline selection): Bromofluorobenzene.
The following manual integrations were performed in the sample(s) AA22766-SCV2 due to poor integration (peak tailing, baseline selection): Isobutyl Alcohol, Bromofluorobenzene.

Analysis: EPA 8260B
Sequence: AA23761
Affected Sample(s): AA23761-CAL1, AA23761-CAL2, AA23761-CAL3, AA23761-CAL6, AA23761-CAL7, AA23761-SCV1, AA23761-SCV2
Nonconformance: Manual integrations
Additional Information: The following manual integrations were performed in the sample(s) AA23761-CAL1 due to ISTD reintegration: Pentafluorobenzene, 1,4- Difluorobenzene, Chlorobenzene-d5, 1,4-Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) AA23761-CAL2 due to poor integration (peak tailing, baseline selection): Acrolein, Acetone, Chloropropene, Cyclohexane, Methyl Cyclohexane, Methyl Methacrylate, 4-Methyl-2-Pentaone, 2-Chloroethyl vinyl ether.
The following manual integrations were performed in the sample(s) AA23761-CAL2 due to ISTD reintegration and baseline drop for split peaks: Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA23761-CAL2 due to ISTD reintegration and poor integration (peak tailing, baseline selection): 1,4-Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) AA23761-CAL3 due to poor integration (peak tailing, baseline selection): Acrolein, 2-Chloroethyl vinyl ether, Naphthalene.
The following manual integrations were performed in the sample(s) AA23761-CAL6 due to poor integration (peak tailing, baseline selection): Chloroethane.
The following manual integrations were performed in the sample(s) AA23761-CAL7 due to poor integration (peak tailing, baseline selection): Acetone.
The following manual integrations were performed in the sample(s) AA23761-SCV1 due to ISTD reintegration: Pentafluorobenzene, 1,4- Difluorobenzene.
The following manual integrations were performed in the sample(s) AA23761-SCV2 due to ISTD reintegration: Pentafluorobenzene, 1,4- Difluorobenzene, Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA23761-SCV2 due to poor integration (peak tailing, baseline selection): Naphthalene.

Analysis: EPA 8260B
Sequence: AA24249
Affected Sample(s): AA24249-CCV1, 3E21023-BS1, 3E21023-MS1, 3E21023-MSD1
Nonconformance: Manual integrations
Additional Information: The following manual integrations were performed in the sample(s) AA24249-CCV1, 3E21023-BS1 due to ISTD reintegration: Pentafluorobenzene.
The following manual integrations were performed in the sample(s) AA24249-CCV1 due to incorrect peak selection/peak not found: 2-Chloroethyl vinyl ether.
The following manual integrations were performed in the sample(s) 3E21023-MS1 due to ISTD reintegration and poor integration (peak tailing, baseline selection): Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) 3E21023-MS1 due to incorrect peak selection/peak not found: 1,4-Dioxane.
The following manual integrations were performed in the sample(s) 3E21023-MS1 due to ISTD reintegration, poor integration (peak tailing, baseline selection), and hump integration: Chlorobenzene-d5.

Analysis: EPA 8260B
Sequence: AA24312
Affected Sample(s): AA24312-CCV1, 3E24030-BS1, 3E24030-BSD1
Nonconformance: Manual integrations
Additional Information: The following manual integrations were performed in the sample(s) AA24312-CCV1 due to ISTD reintegration: Pentafluorobenzene, 1,4-Difluorobenzene, Chlorobenzene-d5, 1,4-

Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) 3E24030-BS1 due to incorrect peak selection/peak not found: 1,4-Dioxane.
The following manual integrations were performed in the sample(s) 3E24030-BS1, 3E24030-BSD1 due to ISTD reintegration: Pentafluorobenzene.

Analysis:EPA8081B
Sequence:AA23829
Affected Samples: AA23829-CAL1, AA23829-CAL2
Nonconformance:Manual Integrations
Additional Information: The following manual integrations were performed in the sample(s) AA23829-CAL1, AA23829-CAL 2 due to incorrect peak selection/peak not found: Mirex.

Analysis:EPA8081B
Sequence:AA24376
Affected Samples: AA24376-PEM1, AA24376-CCV1, Veno-SD01-000H [A302428-07], Veno-SD01P-000H [A302428-08], Veno-SD12-000H [A202428-12]
Nonconformance:Manual Integrations
Additional Information: The following manual integrations were performed in the sample(s) AA24376-PEM1, Veno-SD01-000H [A302428-07], Veno-SD01P-000H [A302428-08], Veno-SD12-000H [A202428-12] due to poor integration (peak tailing, baseline selection): 4,4'-DDD.
The following manual integrations were performed in the sample(s) AA24376-CCV1, Veno-SD01-000H [A302428-07] due to ISTD reintegration: DBC.
The following manual integrations were performed in the sample(s) Veno-SD01-000H [A302428-07], Veno-SD01P-000H [A302428-08] due to poor integration (peak tailing, baseline selection): 4,4'-DDT.

Analysis:EPA 8260B
Affected Samples: Veno-SD02-000H [A302428-10], 3E21023-MS1, 3D21023-MSD1
Nonconformance: The spike recovery was outside acceptance limits for 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2-Dibromomethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Bromodichloromethane, Bromoform, Chlorobenzene, cis-1,3-Dichloropropene, Dibromochloromethane, Ethylbenzene, Isopropylbenzene, m,p-Xylenes, Methyl Acetate, o-Xylene, Styrene, and trans-1,3-Dichloropropene in the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

Analysis:EPA 8260B
Affected Samples: Veno-SD02-000H [A302428-10], 3E21023-MS1
Nonconformance: The spike recovery was outside acceptance limits for 1,2-Dichloroethane, Tetrachloroethene, and Toluene in the MS. The batch was accepted based on acceptable LCS recovery.

Analysis:EPA 8260B
Affected Samples: 3E21023-MS1, 3D21023-MSD, Veno-SD02-0H01 [A302428-13]
Nonconformance: The surrogate recovery was outside acceptance limits for 4-Bromoflurobenzene.

Analysis:EPA 8081B
Affected Samples: Veno-SS01P-0002 [A302428-02], Veno-SS04-0001 [A302428-03], Veno-SD01P-000H [A302428-08], Veno-SD01-0H01 [A302428-09], Veno-SD03-000h [A302428-11], Veno-SD12-000H [A302428-12], Veno-SD02-0H01 [A302428-13]
Nonconformance: The surrogate recovery was outside acceptance limits for 2,4,5,6-TCMX due to suspected matrix interference (sludge-like, wet matrix). The client was informed of the low surrogate recovery.

Analysis:EPA 8081B
Affected Samples: Veno-SS05-0002 [A302428-04]
Nonconformance: The sample was analyzed at a dilution due to suspected matrix interference (dark, opaque extract). The surrogate recoveriers were not calculated for 2,4,5,6-TCMX and Decachlorobiphenyl, the surrogates diluted out of calibration range.

Analysis:EPA 8081B
Affected Samples: Veno-SS05-0002 [A302428-04]
Nonconformance: Confirmation result exceeds 40%RPD for 4,4'-DDD, higher result reported.

PROJECT NARRATIVE

SD02-0H01 [A302428-13]
Nonconformance: Samples were received into the laboratory outside acceptable holding time. The results are reported as qualified out of hold.

Subcontracted Analysis
Subcontracted analysis will be submitted under separate report. A summary of subcontracted analysis and samples is outlined below.
Analysis: ASTM D422
Samples: Veno-SS01-0002 [A302428-01], Veno-SS01P-0002 [A302428-02], Veno-SS04-0001 [A302428-03], Veno-SS05-0002 [A302428-04], Veno-SS07-0002 [A302428-05], Veno-SD01-000H [A302428-07], Veno-SD01P-000H [A302428-08], Veno-SD01-0H01 [A302428-09], Veno-SD02-000h [A302428-10], Veno-SD03-000h [A302428-11], Veno-SD12-000H [A302428-12], Veno-SD02-0H01 [A302428-13]

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy package and in computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures.

Digitally signed by Marcia Colon
Reason: I am the author of this document
Date: 2013.06.12 08:49:09 -04'00'

Marcia Colon
June 12, 2013
Project Manager

Environmental Conservation Labs, Inc.
10775 Central Port Drive
Orlando, FL 32824

phone: (407) 826-5314

ELECTRONIC CHAIN OF CUSTODY RECORD

C.O.C. 20130515-LaChiva Lagoon-ENCO-01

Report to: PLEASE PRINT
Company Name: CH2MHILL
Address: 15010 Conference Dr. ; 200
Chantilly, VA 20151
Attn: Mike Zamboni
Phone: 703.376.5301
Fax: 703.376.5801

Invoice to: PLEASE PRINT
Company Name: Seb Contact
Address:
Attn:
Phone:
Fax:

Project Name/Number: Terrestrial UXO Site Sampling/424191.FI.FK.04
Purchase Order Number: 943380
Sampler (Print): not required
Sampler (Signature): not required
Date Shipped: 5/15/13
Carrier: FedEx
Waybill No.: 799768947489
Comments:

Analysis Requested/Method Number: TOC, ASTM D422

Sample Identification	Location	Date Collected	Time Collected	Time Zone	No. of Containers	Aq	Sed.	Soil	GW	TOC	ASTM D422
VENO-SS01-0002		5/14/13	09:30	AST	2			✓		X	X
VENO-SS01P-0002		5/14/13	09:30	AST	2			✓		X	
VENO-SS04-0001		5/14/13	11:00	AST	2			✓		X	X
VENO-SS05-0002		5/14/13	10:30	AST	2			✓		X	X
VENO-SS07-0002		5/14/13	13:30	AST	2			✓		X	X
VENO-EB01-051413-SS		5/14/13	08:35	AST	1	✓				X	X
VENO-SD01-000H		5/15/13	10:30	AST	5		✓			X	X
VENO-SD01P-000H		5/15/13	10:30	AST	4		✓			X	X
VENO-SD01-0H01		5/15/13	10:45	AST	5		✓			X	X
VENO-SD02-000H		5/15/13	09:15	AST	5		✓			X	X
VENO-SD02-000H-MS		5/15/13	09:15	AST	4		✓			X	X

Shuttle Temperature:
Turnaround Requested: Check one ☑ Std 28 days ☐ One week ☐ 24/48 Hrs ☐ Other
Sample Disposal: ~~☐ Return to client ☐ Disposal by Lab (30 day retention)~~ not applicable

Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
Sampler	5/15/13	1300	5/16/13				
Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received at lab by:
					5/16/13	9:25	

White: Return to client with report Yellow: Laboratory Copy Pink: Sampler

Note: The first sampled date of the ARF will be used as the COC number unless indicated otherwise.

KC-360 2°C
BW-25 2°C

069

Environmental Conservation Labs, Inc.
10775 Central Port Drive
Orlando, FL 32824

phone: (407) 826-5314

ELECTRONIC CHAIN OF CUSTODY RECORD

C.O.C. 20130515-LaChivaLagoon-ENCO-02

Report to: PLEASE PRINT
Company Name: CH2MHILL — Phone: 703.376.5301
Address: 15010 Conference Dr. ; 200
Chantilly, VA 20151 — Fax: 703.376.5801
Attn: Mike Zamboni

Invoice to: PLEASE PRINT
Company Name: See Contact — Phone:
Address:
Fax:
Attn:

Project Name/Number: Terrestrial/UXO Site Sampling/424191.FLFK.04
Sampler (Print): not required
Purchase Order Number: 943380
Sampler (Signature): not required

Date Shipped: 5/15/13
Carrier: FedEx
Waybill No.: 799766947489
Comments:

Sample Identification	Location	Date Collected	Time Collected	Time Zone	No. of Containers	Aq	Sed.	Soil		24-hr Grab (TC, Tox, pH) per LC/Comm	504-546 EDB	504-505 EDB	504-505 DBCP	TOC	ASTM D422							
VENO-SD02-000H-SD		5/15/13	09:15	AST	4		✓			X	X	X										airbill(2) 799767223857
VENO-SD03-000H		5/15/13	08:15	AST	5		✓			X	X	X	X	X	X							
VENO-SD12-000H		5/15/13	08:30	AST	5		✓			X	X	X	X	X	X							
VENO-SD02-0H01		5/15/13	10:00	AST	5		✓			X	X	X	X	X	X							
VENO-EB01-051513-SD		5/15/13	07:00	AST	6	✓				X	X	X										
VENO-TB01-051513-SD		5/15/13	08:00	AST	2	✓				X												
									✓													
									✓													
									✓													
									✓													
									✓													

Shuttle Temperature:
Turnaround Requested: Check one ☑ Std 28 days ☐ One week ☐ 24/48 Hrs. ☐ Other
Sample Disposal: ~~☐ Return to client ☐ Disposal by Lab (30 day receipt)~~ not applicable

Relinquished by/Sampler:	Date: 5/15/13	Time: 1300	Received by:	Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:	Relinquished by:	Date 5/16/13	Time 9:25	Received at lab by:

White: Return to client with report — Yellow: Laboratory Copy — Pink: Sampler

Note: The first sampled date of the ARF will be used as the COC number unless indicated otherwise.

070

WORK ORDER

Printed: 5/16/2013 12:22:04PM

A302428

ENCO Orlando

Client:	**CH2M Hill, Inc. (CH029)**	**Lab Project Mgr:**	**Marcia Colon**
Project:	**East Vieques La Chiva SWMU 1, CTO-0037**	**Project Number:**	**408040**
PO #:	**948828**		

Report To:
CH2M Hill, Inc. (CH029)
Michael Zamboni
15010 Conference Center Drive, Suite 200
Chantilly, VA 20151
Phone: (703) 376-5301
Fax:

Invoice To:
CH2M Hill, Inc. (CH029)
Accounts Payable
PO Box 241329
Denver, CO 80224
Phone :(703) 376-5301
Fax:

Client Notes

Project Notes

Work Order Notes

NOTE: These are International Samples from Puerto Rico. JFF 5/16/13

Date Due:	06-Jun-13 17:00 (14 day TAT)		
Received By:	Joanne Fournier	Date Received:	16-May-13 09:25
Logged In By:	Joanne Fournier	Date Logged In:	16-May-13 10:24

Cooler: BW-25 received at 2.0°C

Containers Intact	Y	Containers Properly Preserved	Y	Proper Containers Received	Y	COC/Labels Agree	Y	Custody Seals Intact	Y
Volatile Containers Preserved	Y	Volatile Containers Headspace Fre	Y	Aqueous Samples Checked for Residual Cl	N	All Samples in PreLog Received	N	Received On Ice	Y

Cooler: KC-360 received at 2.0°C

Containers Intact	Y	Containers Properly Preserved	Y	Proper Containers Received	Y	COC/Labels Agree	Y	Custody Seals Intact	Y
Volatile Containers Preserved	Y	Volatile Containers Headspace Fre	Y	Aqueous Samples Checked for Residual Cl	N	All Samples in PreLog Received	N	Received On Ice	Y

Analysis	Due	TAT	Expires	Status	Comments
A302428-01 Veno-SS01-0002 [Soil] Sampled 14-May-13 09:30 Eastern					
8081B DOD	06-Jun-13 15:00	14	28-May-13 09:30	Received	DDD,DDE,DDT only
pH 9045D DOD	06-Jun-13 15:00	14	14-May-13 09:44	Received	
Solids, Dry Weight	06-Jun-13 15:00	14	10-Nov-13 09:30	Received	Auto-Included
TOC Walkley Black DOD	06-Jun-13 15:00	14	13-Jun-13 09:30	Received	
A302428-02 Veno-SS01P-0002 [Soil] Sampled 14-May-13 09:30 Eastern					
8081B DOD	06-Jun-13 15:00	14	28-May-13 09:30	Received	DDD,DDE,DDT only
Solids, Dry Weight	06-Jun-13 15:00	14	10-Nov-13 09:30	Received	

WORK ORDER

Printed: 5/16/2013 12:22:04PM

A302428

ENCO Orlando

Client:	**CH2M Hill, Inc. (CH029)**	**Lab Project Mgr:**	**Marcia Colon**
Project:	**East Vieques La Chiva SWMU 1, CTO-0037**	**Project Number:**	**408040**
PO #:	**948828**		

Analysis	Due	TAT	Expires	Status	Comments
A302428-03 Veno-SS04-0001 [Soil] Sampled 14-May-13 11:00 Eastern					
8081B DOD	06-Jun-13 15:00	14	28-May-13 11:00	Received	DDD,DDE,DDT only
pH 9045D DOD	06-Jun-13 15:00	14	14-May-13 11:14	Received	
Solids, Dry Weight	06-Jun-13 15:00	14	10-Nov-13 11:00	Received	Auto-Included
TOC Walkley Black DOD	06-Jun-13 15:00	14	13-Jun-13 11:00	Received	
A302428-04 Veno-SS05-0002 [Soil] Sampled 14-May-13 10:30 Eastern					
8081B DOD	06-Jun-13 15:00	14	28-May-13 10:30	Received	DDD,DDE,DDT only
pH 9045D DOD	06-Jun-13 15:00	14	14-May-13 10:44	Received	
Solids, Dry Weight	06-Jun-13 15:00	14	10-Nov-13 10:30	Received	Auto-Included
TOC Walkley Black DOD	06-Jun-13 15:00	14	13-Jun-13 10:30	Received	
A302428-05 Veno-SS07-0002 [Soil] Sampled 14-May-13 13:30 Eastern					
8081B DOD	06-Jun-13 15:00	14	28-May-13 13:30	Received	DDD,DDE,DDT only
pH 9045D DOD	06-Jun-13 15:00	14	14-May-13 13:44	Received	
Solids, Dry Weight	06-Jun-13 15:00	14	10-Nov-13 13:30	Received	Auto-Included
TOC Walkley Black DOD	06-Jun-13 15:00	14	13-Jun-13 13:30	Received	
A302428-06 Veno-EB01-051413-SS [Water] Sampled 14-May-13 08:35 Eastern					**Per EMail 8260 and 8270 not needed. JFF 5/16/13**
8081B DOD	06-Jun-13 15:00	14	21-May-13 08:35	Received	DDD,DDE,DDT only
A302428-07 Veno-SD01-000H [Soil] Sampled 15-May-13 10:30 Eastern					
8081B DOD	06-Jun-13 15:00	14	29-May-13 10:30	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 10:30	Received	
8270D TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 10:30	Received	
pH 9045D DOD	06-Jun-13 15:00	14	15-May-13 10:44	Received	
Solids, Dry Weight	06-Jun-13 15:00	14	11-Nov-13 10:30	Received	
TOC Walkley Black DOD	06-Jun-13 15:00	14	14-Jun-13 10:30	Received	
A302428-08 Veno-SD01P-000H [Soil] Sampled 15-May-13 10:30 Eastern					
8081B DOD	06-Jun-13 15:00	14	29-May-13 10:30	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 10:30	Received	
8270D TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 10:30	Received	
Solids, Dry Weight	06-Jun-13 15:00	14	11-Nov-13 10:30	Received	

A302428

ENCO Orlando

Client:	CH2M Hill, Inc. (CH029)	Lab Project Mgr:	Marcia Colon
Project:	East Vieques La Chiva SWMU 1, CTO-0037	Project Number:	408040
PO #:	948828		

Analysis	Due	TAT	Expires	Status	Comments
A302428-09 Veno-SD01-0H01 [Soil] Sampled 15-May-13 10:45 Eastern					
8081B DOD	06-Jun-13 15:00	14	29-May-13 10:45	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 10:45	Received	
8270D TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 10:45	Received	
pH 9045D DOD	06-Jun-13 15:00	14	15-May-13 10:59	Received	
Solids, Dry Weight	06-Jun-13 15:00	14	11-Nov-13 10:45	Received	
TOC Walkley Black DOD	06-Jun-13 15:00	14	14-Jun-13 10:45	Received	
A302428-10 Veno-SD02-000H [Soil] Sampled 15-May-13 09:15 Eastern					**MS/MSD on 8260 8270 8081 per coc. JFF 5/16/13**
8081B DOD	06-Jun-13 15:00	14	29-May-13 09:15	Received	MS/MSD. DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 09:15	Received	MS/MSD
8270D TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 09:15	Received	MS/MSD
pH 9045D DOD	06-Jun-13 15:00	14	15-May-13 09:29	Received	
Solids, Dry Weight	06-Jun-13 15:00	14	11-Nov-13 09:15	Received	MS/MSD
TOC Walkley Black DOD	06-Jun-13 15:00	14	14-Jun-13 09:15	Received	
A302428-11 Veno-SD03-000H [Soil] Sampled 15-May-13 08:15 Eastern					
8081B DOD	06-Jun-13 15:00	14	29-May-13 08:15	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 08:15	Received	
8270D TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 08:15	Received	
pH 9045D DOD	06-Jun-13 15:00	14	15-May-13 08:29	Received	
Solids, Dry Weight	06-Jun-13 15:00	14	11-Nov-13 08:15	Received	
TOC Walkley Black DOD	06-Jun-13 15:00	14	14-Jun-13 08:15	Received	
A302428-12 Veno-SD12-000H [Soil] Sampled 15-May-13 08:30 Eastern					
8081B DOD	06-Jun-13 15:00	14	29-May-13 08:30	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 08:30	Received	
8270D TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 08:30	Received	
pH 9045D DOD	06-Jun-13 15:00	14	15-May-13 08:44	Received	
Solids, Dry Weight	06-Jun-13 15:00	14	11-Nov-13 08:30	Received	
TOC Walkley Black DOD	06-Jun-13 15:00	14	14-Jun-13 08:30	Received	
A302428-13 Veno-SD02-0H01 [Soil] Sampled 15-May-13 10:00 Eastern					
8081B DOD	06-Jun-13 15:00	14	29-May-13 10:00	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 10:00	Received	
8270D TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 10:00	Received	
pH 9045D DOD	06-Jun-13 15:00	14	15-May-13 10:14	Received	
Solids, Dry Weight	06-Jun-13 15:00	14	11-Nov-13 10:00	Received	
TOC Walkley Black DOD	06-Jun-13 15:00	14	14-Jun-13 10:00	Received	

A302428

ENCO Orlando

Client:	CH2M Hill, Inc. (CH029)	Lab Project Mgr:	Marcia Colon
Project:	East Vieques La Chiva SWMU 1, CTO-0037	Project Number:	408040
PO #:	948828		

Analysis	Due	TAT	Expires	Status	Comments
A302428-14 Veno-EB01-051513-SD [Water] Sampled 15-May-13 07:00 Eastern					
8081B DOD	06-Jun-13 15:00	14	22-May-13 07:00	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 07:00	Received	
8270D TCL SOM01.2 DOD	06-Jun-13 15:00	14	22-May-13 07:00	Received	
A302428-15 Veno-TB01-051513-SD [Water] Sampled 15-May-13 08:00 Eastern					
8260B TCL SOM01.2 DOD	06-Jun-13 15:00	14	29-May-13 08:00	Received	
Kemron Environmental Service					
A302428-01 Veno-SS01-0002 [Soil] Sampled 14-May-13 09:30 Eastern					
Grain Size ASTM D422	06-Jun-13 15:00	14	11-Jun-13 09:30	SubContracted	to Kemron
A302428-03 Veno-SS04-0001 [Soil] Sampled 14-May-13 11:00 Eastern					
Grain Size ASTM D422	06-Jun-13 15:00	14	11-Jun-13 11:00	SubContracted	to Kemron
A302428-04 Veno-SS05-0002 [Soil] Sampled 14-May-13 10:30 Eastern					
Grain Size ASTM D422	06-Jun-13 15:00	14	11-Jun-13 10:30	SubContracted	to Kemron
A302428-05 Veno-SS07-0002 [Soil] Sampled 14-May-13 13:30 Eastern					
Grain Size ASTM D422	06-Jun-13 15:00	14	11-Jun-13 13:30	SubContracted	to Kemron
A302428-07 Veno-SD01-000H [Soil] Sampled 15-May-13 10:30 Eastern					
Grain Size ASTM D422	06-Jun-13 15:00	14	12-Jun-13 10:30	SubContracted	to Kemron
A302428-09 Veno-SD01-0H01 [Soil] Sampled 15-May-13 10:45 Eastern					
Grain Size ASTM D422	06-Jun-13 15:00	14	12-Jun-13 10:45	SubContracted	to Kemron
A302428-10 Veno-SD02-000H [Soil] Sampled 15-May-13 09:15 Eastern					**MS/MSD on 8260 8270 8081 per coc. JFF 5/16/13**
Grain Size ASTM D422	06-Jun-13 15:00	14	12-Jun-13 09:15	SubContracted	to Kemron
A302428-11 Veno-SD03-000H [Soil] Sampled 15-May-13 08:15 Eastern					
Grain Size ASTM D422	06-Jun-13 15:00	14	12-Jun-13 08:15	SubContracted	to Kemron
A302428-12 Veno-SD12-000H [Soil] Sampled 15-May-13 08:30 Eastern					
Grain Size ASTM D422	06-Jun-13 15:00	14	12-Jun-13 08:30	SubContracted	to Kemron
A302428-13 Veno-SD02-0H01 [Soil] Sampled 15-May-13 10:00 Eastern					
Grain Size ASTM D422	06-Jun-13 15:00	14	12-Jun-13 10:00	SubContracted	to Kemron

Reviewed By

Date

YES NO N/A

I. **PACKAGE COMPLETENESS AND DELIVERABLES**

CASE NUMBER: A302428 LAB: ENCO

SITE NAME: East Vieques La Chiva SWMU 1

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format or CLP Forms Equivalent? ☑ ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative, and/or cover letter signed release present? ☑ ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? ☑ ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

II. **VOLATILE ANALYSES**

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Reports, and/or Chain of Custodies from the field samplers present for all samples sign release present? ☑ ___ ___

ACTION: If no, contact the laboratory/sampling team for replacement of missing or illegible copies.

1.2 Is a sampling trip report present (if required)? ☑ ___ ___

1.3 Sample Conditions/Problems

YES NO N/A

1.3.1 Do the Traffic Reports, Chain of Custodies, or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ✓ 010513

ACTION: If all the VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, flag all positive results "J" and all non-detects "R". See attached sheet

ACTION: If samples were not iced or if the ice was melted upon receipt at the laboratory and the temperature of the cooler was elevated (>10°C), flag all positive results "J" and all non-detects non"UJ".

temp 2°C

2.0 Holding Times

2.1 Have any volatile holding times, determined from date of collection to date of analysis, been exceeded? ✓

The maximum holding time for aqueous samples is 14 days.

The maximum holding time for soils non aqueous samples is 14 days.

NOTE: If unpreserved, aqueous samples maintained at 4°C for aromatic hydrocarbons analysis must be analyzed within 7 days. If preserved with HCL acid to a pH<2 and stored at 4°C, then aqueous samples must be analyzed within 14 days from time of collection. For non-aqueous samples for volatile components that are frozen (less than 7°C) or are properly cooled (4°C ± 2°C) and perserved with $NaHSO_4$, the maximum holding time is 14 days from sample collection. If

HOLDING TIME SUMMARY

EPA 8260B

Laboratory: ENCO Orlando

SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
Veno-SD01-000H	05/15/13 10:30	05/16/13 09:25	05/21/13 12:35	NA	NA	05/21/13 17:59	6.00	14.00	
Veno-SD01P-000H	05/15/13 10:30	05/16/13 09:25	05/21/13 12:35	NA	NA	05/21/13 18:31	6.00	14.00	
Veno-SD01-0H01	05/15/13 10:45	05/16/13 09:25	05/21/13 12:35	NA	NA	05/21/13 19:03	6.00	14.00	
Veno-SD02-000H	05/15/13 09:15	05/16/13 09:25	05/21/13 12:35	NA	NA	05/21/13 17:28	6.00	14.00	
Veno-SD03-000H	05/15/13 08:15	05/16/13 09:25	05/21/13 12:35	NA	NA	05/21/13 19:34	6.00	14.00	
Veno-SD12-000H	05/15/13 08:30	05/16/13 09:25	05/21/13 12:35	NA	NA	05/21/13 20:06	6.00	14.00	
Veno-SD02-0H01	05/15/13 10:00	05/16/13 09:25	05/21/13 12:35	NA	NA	05/21/13 20:37	6.00	14.00	
Veno-EB01-051513-SD	05/15/13 07:00	05/16/13 09:25	05/24/13 12:57	NA	NA	05/24/13 18:14	9.00	14.00	
Veno-TB01-051513-SD	05/15/13 08:00	05/16/13 09:25	05/24/13 12:57	NA	NA	05/24/13 18:44	9.00	14.00	

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 302428

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	% Moisture
VENO-SD02-000H	53.08
VENO-SD03-000H	53.85
VENO-SD12-000H	60.87

YES NO N/A

uncertain about preservation, contact the laboratory /sampling team to determine whether or not samples were preserved.

ACTION: Qualify sample results according to Table 1:

Table 1. Holding Time Actions for Trace Volatile Analysis

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤7 days	No qualifications	
	No	> 7 days	J	R
	Yes	≤14 days	No qualifications	
	Yes	> 14 days	J	R
Non Aqueous	No	≤ 14 days	J	R
	Yes	≤ 14 days	No qualifications	
	Yes/No	> 14 days	J	R

3.0 Surrogate Recovery (CLP Form II Equivalent)

3.1 Have the volatile surrogate recoveries been listed on Surrogate Recovery forms for each of the following matrices:

a. Water [✓] ___ ___

b. Soil [✓] ___ ___

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery forms for each matrix:

a. Water [✓] ___ ___

b. Soil [✓] ___ ___

ACTION: If large errors exist, deliverables are unavailable or information is missing, document the effect(s) in Data

YES NO N/A

Assessments and contact the laboratory/project officer/appropriate official for an explanation /resubmittal, make any necessary corrections and document effect in the Data Assessment.

3.3 Were the surrogate recovery limits followed per Table 2. If Table 2 criteria were not followed, the laboratory may use in-house performance criteria (per SW-846, Method 8000C, section 9.7). Other compounds may be used as surrogates, depending upon the analysis requirements. [✓] ___ ___

lab

Table 2. Surrogate Spike Recovery Limits for Water and Soil/Sediments

DMC	Recovery Limits (%)Water	Recovery Limits Soil/Sediment
4-Bromofluorobenzene	80-120	70-130
Dibromofluoromethane	80-120	70-130
Toluene-d_8	80-120	70-130
Dichloroethane-d_4	80-120	70-130

Note: Use above table if laboratory did not provide in house recovery criteria.

Note: Other compounds may be used as surrogated depending upon the analysis requirements.

3.4 Were outliers marked correctly with an asterisk? [✓] ___ ___

ACTION: Circle all outliers with a red pencil.

3.5 Were one or more volatile surrogate recoveries out of specification for any sample or method blank. Table 2. [✓] ___ ___

If yes, were samples reanalyzed? [ ] ✓ ___

See attached e-mail from lab

Were method blanks reanalyzed? [ ] ___ ✓

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24249	Instrument:	OVGCMS2
Matrix:	Soil	Calibration:	1301045

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Veno-SD12-000H (A302428-12)			Lab File ID: 2EP012.D		Analyzed: 05/21/13 20:06			
Dibromofluoromethane	0.131	88	74 - 133	10.9	10.898	0.0020	+/-1.0	
Toluene-d8	0.131	98	85 - 115	13.17	13.16	0.0100	+/-1.0	
4-Bromofluorobenzene	0.131	89	85 - 120	15.68	15.674	0.0060	+/-1.0	
Veno-SD02-0H01 (A302428-13)			Lab File ID: 2EP013.D		Analyzed: 05/21/13 20:37			
Dibromofluoromethane	0.0961	86	74 - 133	10.91	10.898	0.0120	+/-1.0	
Toluene-d8	0.0961	96	85 - 115	13.16	13.16	0.0000	+/-1.0	
4-Bromofluorobenzene	0.0961	83	85 - 120	15.67	15.674	-0.0040	+/-1.0	* JNS
Matrix Spike (3E21023-MS1)			Lab File ID: 2EP019.D		Analyzed: 05/21/13 23:46			
Dibromofluoromethane	0.122	83	74 - 133	10.9	10.898	0.0020	+/-1.0	
Toluene-d8	0.122	92	85 - 115	13.16	13.16	0.0000	+/-1.0	
4-Bromofluorobenzene	0.122	82	85 - 120	15.67	15.674	-0.0040	+/-1.0	*
Matrix Spike Dup (3E21023-MSD1)			Lab File ID: 2EP020.D		Analyzed: 05/22/13 00:17			
Dibromofluoromethane	0.136	85	74 - 133	10.91	10.898	0.0120	+/-1.0	
Toluene-d8	0.136	92	85 - 115	13.16	13.16	0.0000	+/-1.0	
4-Bromofluorobenzene	0.136	83	85 - 120	15.67	15.674	-0.0040	+/-1.0	*

YES NO N/A

ACTION: If all surrogate recoveries are > 10% but 1 or more compounds do not meet method specifications:

1. Flag all positive results as estimated ("J").
2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.
3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects, but qualify positive results as estimated "J".

If any surrogate has a recovery of < 10%:

1. Positive results are qualified with ("J").
2. Non-detects for that should be qualified as unusable ("R").

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. The basic concern is whether the blank problems represent an isolated problem with the blank alone or whether there is a fundamental problem with the analytical process. If one or more samples in the batch show acceptable surrogate recoveries, the reviewer may choose the blank problem to be an isolated occurrence.

3.6 Are there any transcription/calculation errors between raw data and reported data? [ ] [✓] [ ]

ACTION: If large errors exist, take action as specified in section 3.2 above.

4.0 Laboratory Control Sample(Form III/Equivalent)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples of a similar matrix, per SDG. [✓] [ ] [ ]

YES NO N/A

Note: LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

4.2 Were the Laboratory Control Samples analyzed at the required frequency for each of the following matrices:

A. Water [✓] ___ ___

B. Soil [✓] ___ ___

C. Med Soil [ ] ___ ___

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

4.3 Have in house LCS recovery limits been developed (Method 8000C, Sect 9.7). [✓] ___ ___

4.4 If in house limits are not developed, are LCS acceptance recovery limits between 70 - 130% (Method 8000c Sect 9.5)? [ ] ___ [✓]

4.5 Were one or more of the volatile LCS recoveries outside the in house laboratory recovery criteria for spiked analytes? If in house limits are not present use 70 - 130% recovery limits. [ ] ___ [✓]

YES NO N/A

Table 3. LCS Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	Non-Detected Spiked Compounds
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

5.0 Matrix Spikes(Form III or equivalent) VEND-SD02-000H

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? ✓ ___ ___

NOTE: The laboratory should use one matrix spike and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If the sample is not expected to contain target analytes, a MS/MSD should be analyzed (SW-846, Method 8260B, Sect 8.4.2).

5.2 Have MS/MD or MS/MSD results been summarized on modified CLP Form III? ✓ ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples

YES NO N/A

of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000C, section 9.5.])

a. Water [ ] ___ ___

b. Waste [ ] ___ ___

c. Soil/Solid [✓] ___ ___

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene. The concentration of the LCS should be determined as described SW-Method 8000C Section 9.5.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 Have in house MS recovery limits been developed (Method 8000C, Sect 9.7) for each matrix. [✓] ___ ___

5.5 Were one or more of the volatile MS/MSD recoveries outside of the in-house laboratory recovery criteria for spiked analytes? If none are present, then use 70-130% recovery as per SW-846, 8000C, Sect. 9.5.4. [✓] ___ ___

ACTION: Circle all outliers with a red pencil.

NOTE: If any individual % recovery in the MS (or MSD) falls outside the designated range for recovery the reviewer should determine if there is a matrix effect. A matrix effect is indicated if the LCS data are within limits but the MS data exceeds the limits.

YES NO N/A

NOTE: No qualification of data is necessary on MS and MSD data alone. However, using informed professional judgement, the data reviewer may use MS and MSD results in conjunction with other QC criteria to determine the need for some qualification.

Note: The data reviewer should first try to determine to what extent the results of the MS and MSD affect the associated data. This determination should be made with regard to he MS and MSD sample itself, as well as specific analytes for all samples associated with the MS and MSD.

Note: In those instances where it can be determine that the results of the MS and MSD affect only the sample spiked, limit qualification to this sample only. However, it may be determined through the MS and MSD results that a laboratory is having a systematic problem in the analysis of one or more analytes that affect all associated samples, and the reviewer must use professional judgement to qualify the data from all associated samples.

Note: The reviewer must use professional judgement to determine the need for qualification of non-spiked compounds.

ACTION: Follow criteria in Table 4 when professional judgement deems qualification of sample.

Table 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	Non-Detected Spiked Compounds
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

qualified when both MS and MSD exhibited non-compl. rec.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260B

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E21023	Laboratory ID:	3E21023-MS1
Preparation:	EPA 5030B_MS	Initial/Final:	4.36 g / 5 mL

Source Sample Name: Veno-SD02-000H

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	MS CONCENTRATION (mg/kg dry)	MS % REC. #	QC LIMITS REC.	
Dichlorodifluoromethane	0.0489	ND	0.036	74	35 - 135	
Chloromethane	0.0489	ND	0.031	63	50 - 130	
Vinyl chloride	0.0489	ND	0.033	69	60 - 125	
Bromomethane	0.0489	ND	0.032	65	30 - 160	
Chloroethane	0.0489	ND	0.050	102	40 - 155	
Trichlorofluoromethane	0.0489	ND	0.043	87	25 - 185	
Freon 113	0.0489	ND	0.056	115	20 - 189	
Acetone	0.122	0.14	0.21	54	20 - 160	
1,1-Dichloroethene	0.0489	ND	0.059	120	65 - 135	
Carbon disulfide	0.0489	ND	0.027	55	45 - 160	
Methylene Chloride	0.0489	ND	0.047	96	55 - 140	
Methyl-tert-Butyl Ether	0.0489	ND	0.046	95	58 - 123	
trans-1,2-Dichloroethene	0.0489	ND	0.041	83	65 - 135	
cis-1,2-Dichloroethene	0.0489	ND	0.038	78	65 - 125	
1,1-Dichloroethane	0.0489	ND	0.043	88	75 - 125	
2-Butanone	0.122	0.048	0.14	76	30 - 160	
Chloroform	0.0489	ND	0.039	79	70 - 125	
Bromochloromethane	0.0489	ND	0.035	71	70 - 125	
1,1,1-Trichloroethane	0.0489	ND	0.042	86	70 - 135	
Methyl acetate	0.0489	ND	0.11	235 *	70 - 130	J+ MOE
Cyclohexane	0.0489	ND	0.042	86	70 - 130	
Methyl cyclohexane	0.0489	ND	0.038	78	70 - 130	
Carbon Tetrachloride	0.0489	ND	0.041	83	65 - 135	
1,2-Dichloroethane	0.0489	ND	0.032	66 *	70 - 135	
Benzene	0.0489	ND	0.042	85	75 - 125	
Trichloroethene	0.0489	ND	0.036	75	75 - 125	
1,2-Dichloropropane	0.0489	ND	0.038	78	70 - 120	
Bromodichloromethane	0.0489	ND	0.032	65 *	70 - 130	J/UJ
4-Methyl-2-pentanone	0.122	ND	0.094	77	45 - 145	
2-Hexanone	0.122	ND	0.079	65	45 - 145	
cis-1,3-Dichloropropene	0.0489	ND	0.025	50 *	70 - 125	J/UJ

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260B

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E21023	Laboratory ID:	3E21023-MS1
Preparation:	EPA 5030B_MS	Initial/Final:	4.36 g / 5 mL

Source Sample Name: Veno-SD02-000H

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	MS CONCENTRATION (mg/kg dry)	MS % REC. #	QC LIMITS REC.
Toluene	0.0489	ND	0.031	63 *	70 - 125
trans-1,3-Dichloropropene	0.0489	ND	0.026	53 *	65 - 125 J/UJ
1,1,2-Trichloroethane	0.0489	ND	0.032	65	60 - 125
Tetrachloroethene	0.0489	ND	0.029	60 *	65 - 140
Dibromochloromethane	0.0489	ND	0.025	51 *	65 - 130 J/UJ
1,2-Dibromoethane	0.0489	ND	0.029	60 *	70 - 125
Chlorobenzene	0.0489	ND	0.022	46 *	75 - 125
Ethylbenzene	0.0489	ND	0.022	46 *	75 - 125
m,p-Xylenes	0.0978	ND	0.042	43 *	80 - 125
o-Xylene	0.0489	ND	0.020	41 *	75 - 125
Bromoform	0.0489	ND	0.024	48 *	55 - 135
Styrene	0.0489	ND	0.015	30 *	75 - 125
Isopropylbenzene	0.0489	ND	0.019	39 *	75 - 130
1,1,2,2-Tetrachloroethane	0.0489	ND	0.027	55	55 - 130
1,2,4-Trichlorobenzene	0.0489	ND	0.010	20 *	65 - 130 J/UJ
1,3-Dichlorobenzene	0.0489	ND	0.014	28 *	70 - 125
1,4-Dichlorobenzene	0.0489	ND	0.014	29 *	70 - 125
1,2-Dichlorobenzene	0.0489	ND	0.014	28 *	75 - 120
1,2-Dibromo-3-chloropropane	0.0489	ND	0.029	59	40 - 135
1,2,3-Trichlorobenzene	0.0489	ND	0.0096	20 *	60 - 135 J/UJ

COMPOUND	SPIKE ADDED (mg/kg dry)	MSD CONCENTRATION (mg/kg dry)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	0.0544	0.041	75	12	30	35 - 135
Chloromethane	0.0544	0.034	62	9	30	50 - 130
Vinyl chloride	0.0544	0.039	72	15	30	60 - 125
Bromomethane	0.0544	0.034	62	6	30	30 - 160
Chloroethane	0.0544	0.056	103	12	30	40 - 155
Trichlorofluoromethane	0.0544	0.050	91	15	30	25 - 185
Freon 113	0.0544	0.065	120	15	30	20 - 189
Acetone	0.136	0.22	60	7	30	20 - 160

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260B

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E21023	Laboratory ID:	3E21023-MSD1
Preparation:	EPA 5030B_MS	Initial/Final:	3.92 g / 5 mL

Source Sample Name: Veno-SD02-000H

COMPOUND	SPIKE ADDED (mg/kg dry)	MSD CONCENTRATION (mg/kg dry)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	0.0544	0.067	123	13	30	65 - 135
Carbon disulfide	0.0544	0.027	50	2	30	45 - 160
Methylene Chloride	0.0544	0.051	94	8	30	55 - 140
Methyl-tert-Butyl Ether	0.0544	0.051	95	10	30	58 - 123
trans-1,2-Dichloroethene	0.0544	0.047	87	16	30	65 - 135
cis-1,2-Dichloroethene	0.0544	0.043	80	14	30	65 - 125
1,1-Dichloroethane	0.0544	0.050	92	15	30	75 - 125
2-Butanone	0.136	0.14	69	0.7	30	30 - 160
Chloroform	0.0544	0.044	81	13	30	70 - 125
Bromochloromethane	0.0544	0.041	76	17	30	70 - 125
1,1,1-Trichloroethane	0.0544	0.051	93	19	30	70 - 135
Methyl acetate	0.0544	0.12	226 *	7	30	70 - 130
Cyclohexane	0.0544	0.051	93	18	30	70 - 130
Methyl cyclohexane	0.0544	0.046	84	19	30	70 - 130
Carbon Tetrachloride	0.0544	0.048	88	16	30	65 - 135
1,2-Dichloroethane	0.0544	0.038	70	16	30	70 - 135
Benzene	0.0544	0.049	91	17	30	75 - 125
Trichloroethene	0.0544	0.045	83	21	30	75 - 125
1,2-Dichloropropane	0.0544	0.043	78	11	30	70 - 120
Bromodichloromethane	0.0544	0.034	62 *	6	30	70 - 130
4-Methyl-2-pentanone	0.136	0.098	72	4	30	45 - 145
2-Hexanone	0.136	0.083	61	5	30	45 - 145
cis-1,3-Dichloropropene	0.0544	0.026	47 *	4	30	70 - 125
Toluene	0.0544	0.039	72	23	30	70 - 125
trans-1,3-Dichloropropene	0.0544	0.027	50 *	6	30	65 - 125
1,1,2-Trichloroethane	0.0544	0.036	66	12	30	60 - 125
Tetrachloroethene	0.0544	0.037	69	25	30	65 - 140
Dibromochloromethane	0.0544	0.026	47 *	3	30	65 - 130
1,2-Dibromoethane	0.0544	0.034	62 *	14	30	70 - 125
Chlorobenzene	0.0544	0.028	52 *	24	30	75 - 125
Ethylbenzene	0.0544	0.028	51 *	22	30	75 - 125
m,p-Xylenes	0.109	0.054	50 *	25	30	80 - 125

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260B

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E21023	Laboratory ID:	3E21023-MSD1
Preparation:	EPA 5030B_MS	Initial/Final:	3.92 g / 5 mL

Source Sample Name: Veno-SD02-000H

COMPOUND	SPIKE ADDED (mg/kg dry)	MSD CONCENTRATION (mg/kg dry)	MSD % REC. #		% RPD #	QC LIMITS RPD	QC LIMITS REC.
o-Xylene	0.0544	0.026	47	*	25	30	75 - 125
Bromoform	0.0544	0.022	41	*	5	30	55 - 135
Styrene	0.0544	0.018	34	*	21	30	75 - 125
Isopropylbenzene	0.0544	0.026	47	*	30	30	75 - 130
1,1,2,2-Tetrachloroethane	0.0544	0.031	56		14	30	55 - 130
1,2,4-Trichlorobenzene	0.0544	0.013	23	*	24	30	65 - 130
1,3-Dichlorobenzene	0.0544	0.018	34	*	28	30	70 - 125
1,4-Dichlorobenzene	0.0544	0.018	32	*	23	30	70 - 125
1,2-Dichlorobenzene	0.0544	0.018	33	*	25	30	75 - 120
1,2-Dibromo-3-chloropropane	0.0544	0.031	57		6	30	40 - 135
1,2,3-Trichlorobenzene	0.0544	0.012	21	*	20	30	60 - 135

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

YES NO N/A

6.0 Blank (CLP Form IV Equivalent)

6.1 Is the Method Blank Summary form present? [✓] ___ ___

6.2 Frequency of Analysis: Has a method blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? [✓] ___ ___

6.3 Has a method blank been analyzed for each GC/MS system used ? [✓] ___ ___

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject ® all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.4 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for volatile organic compounds? [✓] ___ ___

7.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary. [✓] ___ ___

07/23

	YES	NO	N/A
7.2 Do any field/rinse blanks have positive volatile organic compound results?		✓	

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 5 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

VEN0-TB01-051513-SD MO

VEN0-EB01-051513-SD MO

Table 5. Volatile Organic Analysis Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, Field, Trip, Instrument**	Detects	Not detected	No qualification
	< CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	> CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U, or qualify the data as unusable R
		≥ CRQL and ≥ blank contamination	Use professional judgement
	= CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	Gross contam-ination	Detects	Qualify results as unusable R

* 2x the CRQL for methylene chloride, 2-butanone, and acetone

** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 ug/L.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected volatile organic target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

YES NO N/A

7.3 Are there field/rinse/equipment blanks associated with every sample? ✓ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 GC/MS Apparatus and Materials

8.1 Did the lab use the proper gas chromatographic column(s) for analysis of volatiles by Method 8260B? Check raw data, instrument logs or contact the lab to determine what type of column(s) was (were) used. ✓ ___ ___

NOTE: For the analysis of volatiles, the method requires the use of 60 m. x 0.75 mm capillary column, coated with VOCOL(Supelco) or equivalent column. (see SW-846, page 8260B-7, section 4.9.2)

ACTION: If the specified column, or equivalent, was not used, document the effects in the Data Assessment. Use professional judgement to determine the acceptability of the data.

9.0 GC/MS Instrument Performance Check (CLP Form V Equivalent)

9.1 Are the GC/MS Instrument Performance Check forms present for Bromofluorobenzene (BFB), and do these forms list the associated samples with date/time analyzed? ✓ ___ ___

9.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift? ✓ ___ ___

9.3 Has an instrument performance check solution (BFB)

YES NO N/A

been analyzed for every twelve hours of sample analysis per instrument?(see Table 4, SW-846, page 8260B-36) [✓] ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS GC/MS tuning data are available.

ACTION: If the laboratory/project officer cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable, "R".

9.4 Have the ion abundances been normalized to m/z 95? [✓] ___ ___

9.5 Have the ion abundance criteria been met for each instrument used? [✓] ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If ion abundance criteria are not met, take action as specified in section 3.2.

9.6 Are there any transcription/calculation errors between mass lists and reported values? (Check at least two values but if errors are found, check more.) ___ [✓] ___

9.7 Have the appropriate number of significant figures (two) been reported? [✓] ___ ___

ACTION: If large errors exist, take action as specified in section 3.2.

9.8 Are the spectra of the mass calibration compounds acceptable. [✓] ___ ___

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

	YES	NO	N/A

10.0 Target Analytes (CLP Form I Equivalent)

10.1 Are the Organic Analysis reporting forms present with required header information on each page, for each of the following:

a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates	✓		
c. Blanks	✓		
d. Laboratory Control Samples	✓		

10.2 Are the reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)	✓		
c. Blanks	✓		
d. Laboratory Control Samples	✓		

ACTION: If any data are missing, take action specified in 3.2 above.

10.3 Is chromatographic performance acceptable with respect to:

Baseline stability?	✓		

	YES	NO	N/A
Resolution?	✓		
Peak shape?	✓		
Full-scale graph (attenuation)?	✓		

Other:_____

ACTION: Use professional judgement to determine the acceptability of the data.

10.4 Are the lab-generated standard mass spectra of identified volatile compounds present for each sample? ✓

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the Data Assessment. If spectra are missing, contact the lab for missing spectra.

10.5 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration? ✓

10.6 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? ✓

10.7 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum? ✓

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected ("R"), flagged ("N") - Presumptive evidence of the presence of the compound) or changed to non detected ("U") at the calculated detection limit. In order to be

YES NO N/A

positively identified, the data must comply with the criteria listed in 9.6, 9.7, and 9.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

No TICs

11.0 Tentatively Identified Compounds (TIC) (CLP Form I/TIC Equivalent)

11.1 If Tentatively Identified Compound were required for this project, are all Tentatively Identified Compound reporting forms present; and do listed TICs include scan number or retention time, estimated concentration and a qualifier? [ ] ___ ✓

NOTE: Add "N" qualifier to all TICs which have CAS number, if missing.

NOTE: Have the project officer/appropriate official check the project plan to determine if lab was required to identify non-target analytes (SW-846, page 8260B-23, Sect. 7.6.2).

11.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:

a. Samples and/or fractions as appropriate [ ] ___ ✓

b. Blanks [ ] ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by a CAS#.

NOTE: If TICs are present in the associated blanks take action as specified in section 3.2 above.

YES NO N/A

11.3 Are any priority pollutants listed as TIC compounds (i.e., an BNA compound listed as a VOA TIC)? [ ] ___ ✓

ACTION: 1. Flag with "R" any target compound listed as a TIC.

2. Make sure all rejected compounds are properly reported if they are target compounds.

11.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [ ] ___ ✓

11.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%? [ ] ___ ✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate. Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R". (Common lab contaminants: CO_2(M/E 44), Siloxanes (M/E 73), Hexane, Aldol Condensation Products, Solvent Preservatives, and related byproducts).

12.0 Compound Quantitation and Reported Detection Limits

12.1 Are there any transcription/calculation errors in organic analysis reporting form results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and average initial RRF/CF were used to calculate organic analysis reporting form result. Were any errors found? [ ] ✓ ___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be

YES NO N/A

reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

12.2 Are the method CRQL's adjusted to reflect sample dilutions and, for soils, sample moisture? [✓] ___ ___

ACTION: If errors are large, take action as specified in section 3.2 above.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC accedence dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original reporting form (if present) and substituting the data from the analysis of the diluted sample. Specify which organic analysis reporting form is to be used, then draw a red "X" across the entire page of all reporting forms that should not be used, including any in the summary package.

13.0 Standards Data (GC/MS)

13.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant Reports) present for initial and continuing calibration? [✓] ___ ___

ACTION: If any calibration standard data are missing, take action specified in section 3.2 above.

14.0 GC/MS Initial Calibration (CLP Form VI Equivalent)

YES NO N/A

14.1 Are the Initial Calibration reporting forms present and complete for the volatile fraction? [✓] ___ ___

ACTION: If any calibration forms or standard raw data are missing, take action specified in section 3.2 above.

ACTION: If the percent relative standard deviation (% RSD) is > 20%, (8000C-39)qualify positive results for that analyte "J". When % RSD > 90%,. Qualify all positive results for that analyte "J" and all non-detects results for that analyte "R".

14.2 Are all average RRFs > 0.050? [ ] [✓] ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list. If individual RRF values reported are below the listed values document in the Data Assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with red pencil.

ACTION: For any target analyte with average RRF < 0.05, or for the requirements for the 5 compounds in 14.2 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

14.3 Are response factors stable over the concentration range of the calibration. [✓] ___ ___

NOTE: (Method Requirement) For the following CCC compounds, the %RSD values must be ≤ 30.0%. If %RSD values reported are > 30.0% document in the Data Assessment.

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA23761	Instrument:	OVGCMS3
		Calibration:	1304028

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA23761-TUN1	3DD001.D	04/09/13 07:52
Initial Cal Blank	AA23761-ICB1	3DD002.D	04/09/13 08:22
Cal Standard	AA23761-CAL3	3DD005.D	04/09/13 10:57
Cal Standard	AA23761-CAL4	3DD006.D	04/09/13 11:35
Cal Standard	AA23761-CAL5	3DD007.D	04/09/13 12:05
Cal Standard	AA23761-CAL6	3DD008.D	04/09/13 12:35
Cal Standard	AA23761-CAL7	3DD009.D	04/09/13 13:15
Cal Standard	AA23761-CAL2	3DD012.D	04/09/13 15:17
Cal Standard	AA23761-CAL1	3DD013.D	04/09/13 16:11
Secondary Cal Check	AA23761-SCV1	3DD015.D	04/09/13 17:11
Secondary Cal Check	AA23761-SCV2	3DD016.D	04/09/13 17:41

INITIAL CALIBRATION DATA (Continued)

EPA 8260B

Laboratory: ENCO Orlando

SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Calibration: 1304028

Instrument: OVGCMS3

Matrix: Water

Calibration Date: 04/09/13 12:32

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Dichlorodifluoromethane	1.045137	9.352221	4.963333	0.1039146			15	
Chloromethane	1.452689	11.06914	5.516667	9.312013E-02			SPCC (0.1)	
Vinyl chloride	1.020702	9.178679	5.758334	6.701462E-02			CCC (30)	
Bromomethane	0.4083474	9.871646	6.561667	6.314456E-02			15	
Chloroethane	0.4588251	7.830256	6.836	0.2844984			15	
Trichlorofluoromethane	1.037116	6.81401	7.121667	0.1643185			15	
Freon 113	0.6347338	14.18108	8.096667	0.1025793			15	
Acetone	0.2386982	14.93262	9.035	0.0574048			15	
1,1-Dichloroethene	0.4766797	11.93991	8.066667	0.1012719			CCC (30)	
Carbon disulfide	2.19121	12.62861	8.153333	6.094817E-02			15	
Methylene Chloride	0.8494747	9.791554	8.966667	5.956773E-02			15	
Methyl-tert-Butyl Ether	1.237679	10.64301	9.306667	5.750991E-02			15	
trans-1,2-Dichloroethene	0.7685398	11.74591	9.188333	4.565442E-02			15	
cis-1,2-Dichloroethene	0.7417976	9.613822	10.615	5.201376E-02			15	
1,1-Dichloroethane	1.513364	13.23991	9.998333	7.496301E-02			SPCC (0.1)	
2-Butanone	4.396173E-02	9.342482	11.19833	6.608805E-02	JR		15	
Chloroform	1.402463	13.48206	10.88167	4.060685E-02			CCC (30)	
Bromochloromethane	0.3400808	11.51802	10.845	5.034445E-02			15	
1,1,1-Trichloroethane	0.9983739	9.850187	11.14667	4.894411E-02			15	
Methyl acetate	0.0853104	8.639185	9.178333	8.186206E-02			15	
Cyclohexane	1.39921	13.9509	10.85667	4.714439E-02			15	
Methyl cyclohexane	0.798159	11.89129	12.08167	2.693545E-02			15	
Carbon Tetrachloride	0.4837738	9.638003	11.075	4.711337E-02			15	
1,2-Dichloroethane	0.6051964	8.466085	11.72667	5.018619E-02			15	
Benzene	1.740088	11.51781	11.52333	3.724768E-02			15	
Trichloroethene	0.379863	4.706333	12.07167	3.040346E-02			15	
1,2-Dichloropropane	0.4922404	11.82531	12.59167	3.103671E-02			CCC (30)	
Bromodichloromethane	0.5709082	9.471192	12.61167	2.714976E-02			15	
4-Methyl-2-pentanone	3.096077E-02	11.89777	13.67429	7.079945E-02	JR		15	
2-Hexanone	0.2386703	12.96292	14.38714	3.691063E-02			15	
cis-1,3-Dichloropropene	0.6473497	14.8153	13.18167	0.0252442			15	
Toluene	1.148689	6.382588	13.39333	3.931257E-02			CCC (30)	

INITIAL CALIBRATION DATA (Continued)

EPA 8260B

Laboratory: ENCO Orlando

SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Calibration: 1304028

Instrument: OVGCMS3

Matrix: Water

Calibration Date: 04/09/13 12:32

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
trans-1,3-Dichloropropene	0.5790786	13.40691	13.73333	4.198359E-02			15	
1,1,2-Trichloroethane	0.3784046	12.94258	13.89667	3.938419E-02			15	
Tetrachloroethene	0.3671155	7.951935	13.75667	3.424653E-02			15	
Dibromochloromethane	0.3921035	12.27866	14.08667	3.823486E-02			15	
1,2-Dibromoethane	0.3416361	5.581962	14.34833	3.245463E-02			15	
Chlorobenzene	1.227335	11.68599	14.78	1.210796E-02			SPCC (0.3)	
Ethylbenzene	0.5285616	11.76174	14.73667	0.0347469			CCC (30)	
m,p-Xylenes	0.7123413	8.756345	14.855	3.720799E-02			15	
o-Xylene	0.6615623	12.05617	15.27833	2.784823E-02			15	
Bromoform	0.2399217	13.34164	15.43333	3.579741E-02			SPCC (0.1)	
Styrene	1.072471	14.53876	15.32167	2.787352E-02			15	
Isopropylbenzene	1.710677	10.63016	15.55333	3.394314E-02			15	
1,1,2,2-Tetrachloroethane	0.4673375	9.30072	16.03333	0.019101			SPCC (0.3)	
1,2,4-Trichlorobenzene	1.08187	12.86485	20.16333	4.233861E-02			15	
1,3-Dichlorobenzene	1.835363	10.35498	17.075	3.532443E-02			15	
1,4-Dichlorobenzene	1.862128	9.840238	17.17167	2.003261E-02			15	
1,2-Dichlorobenzene	1.686558	14.14791	17.74667	2.651544E-02			15	
1,2-Dibromo-3-chloropropane	0.1220866	8.640953	18.93667	5.518876E-02			15	
1,2,3-Trichlorobenzene	0.8765956	13.63765	21.345	3.763256E-02			15	
Dibromofluoromethane	0.6806788	8.520567	11.085	4.923857E-02			15	
Toluene-d8	1.177503	4.565039	13.34667	3.230521E-02			15	
4-Bromofluorobenzene	0.5738038	10.83719	15.9	1.625923E-02			15	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24312	Instrument:	OVGCMS3
		Calibration:	1304028

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA24312-TUN1	3ES001.D	05/24/13 13:37
Calibration Check	AA24312-CCV1	3ES002.D	05/24/13 14:07
LCS	3E24030-BS1	3ES003.D	05/24/13 14:44
LCS Dup	3E24030-BSD1	3ES004.D	05/24/13 15:14
Blank	3E24030-BLK1	3ES005.D	05/24/13 15:44
Veno-EB01-051513-SD	A302428-14	3ES010.D	05/24/13 18:14
Veno-TB01-051513-SD	A302428-15	3ES011.D	05/24/13 18:44

CONTINUING CALIBRATION CHECK

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OVGCMS3	Calibration:	1304028
Lab File ID:	3ES002.D	Calibration Date:	04/09/13 12:32
Sequence:	AA24312	Injection Date:	05/24/13
Lab Sample ID:	AA24312-CCV1	Injection Time:	14:07

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Dichlorodifluoromethane	A	50.0	55	1.045137	1.146164		9.7	20
Chloromethane	A	50.0	42	1.452689	1.233454	0.1	-15.1	20
Vinyl chloride	A	50.0	45	1.020702	0.9143115		-10.4	20
Bromomethane	A	50.0	40	0.4083474	0.3304848		-19.1	20
Chloroethane	A	50.0	45	0.4588251	0.3921271		-14.5	20
Trichlorofluoromethane	A	50.0	52	1.037116	1.088123		4.9	20
Freon 113	A	50.0	44	0.6347338	0.559993		-11.8	20
Acetone	A	50.0	44	0.2386982	0.2111165		-11.6	20
1,1-Dichloroethene	A	50.0	41	0.4766797	0.3863465		-19.0	20
Carbon disulfide	A	50.0	44	2.19121	1.929125		-12.0	20
Methylene Chloride	A	50.0	42	0.8494747	0.7069091		-16.8	20
Methyl-tert-Butyl Ether	A	50.0	42	1.237679	1.038692		-16.1	20
trans-1,2-Dichloroethene	A	50.0	44	0.7685398	0.6783577		-11.7	20
cis-1,2-Dichloroethene	A	50.0	47	0.7417976	0.697552		-6.0	20
1,1-Dichloroethane	A	50.0	44	1.513364	1.332675	0.1	-11.9	20
2-Butanone	A	50.0	47	4.396173E-02	4.102025E-02		-6.7	20
Chloroform	A	50.0	52	1.402463	1.468953		4.7	20
Bromochloromethane	A	50.0	46	0.3400808	0.3153896		-7.3	20
1,1,1-Trichloroethane	A	50.0	58	0.9983739	1.166262		16.8	20
Methyl acetate	A	50.0	41	0.0853104	7.016849E-02		-17.7	20
Cyclohexane	A	50.0	42	1.39921	1.188209		-15.1	20
Methyl cyclohexane	A	50.0	42	0.798159	0.6665545		-16.5	20
Carbon Tetrachloride	A	50.0	51	0.4837738	0.4977817		2.9	20
1,2-Dichloroethane	A	50.0	57	0.6051964	0.6841946		13.1	20
Benzene	A	50.0	45	1.740088	1.577712		-9.3	20
Trichloroethene	A	50.0	53	0.379863	0.4036727		6.3	20
1,2-Dichloropropane	A	50.0	43	0.4922404	0.4248276		-13.7	20
Bromodichloromethane	A	50.0	56	0.5709082	0.6392035		12.0	20
4-Methyl-2-pentanone	A	50.0	49	3.096077E-02	3.026206E-02		-2.3	20

CONTINUING CALIBRATION CHECK

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OVGCMS3	Calibration:	1304028
Lab File ID:	3ES002.D	Calibration Date:	04/09/13 12:32
Sequence:	AA24312	Injection Date:	05/24/13
Lab Sample ID:	AA24312-CCV1	Injection Time:	14:07

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
2-Hexanone	A	50.0	43	0.2386703	0.2059449		-13.7	20
cis-1,3-Dichloropropene	A	50.0	57	0.6473497	0.7394618		14.2	20
Toluene	A	50.0	49	1.148689	1.126352		-1.9	20
trans-1,3-Dichloropropene	A	50.0	56	0.5790786	0.6486432		12.0	20
1,1,2-Trichloroethane	A	50.0	48	0.3784046	0.3618343		-4.4	20
Tetrachloroethene	A	50.0	52	0.3671155	0.378106		3.0	20
Dibromochloromethane	A	50.0	55	0.3921035	0.427439		9.0	20
1,2-Dibromoethane	A	50.0	57	0.3416361	0.388343		13.7	20
Chlorobenzene	A	50.0	51	1.227335	1.252224	0.3	2.0	20
Ethylbenzene	A	50.0	57	0.5285616	0.6035615		14.2	20
m,p-Xylenes	A	100	110	0.7123413	0.7881631		10.6	20
o-Xylene	A	50.0	53	0.6615623	0.7009922		6.0	20
Bromoform	A	50.0	53	0.2399217	0.2534963	0.1	5.7	20
Styrene	A	50.0	58	1.072471	1.254862		17.0	20
Isopropylbenzene	A	50.0	58	1.710677	1.993927		16.6	20
1,1,2,2-Tetrachloroethane	A	50.0	53	0.4673375	0.4974221	0.3	6.4	20
1,2,4-Trichlorobenzene	A	50.0	51	1.08187	1.108237		2.4	20
1,3-Dichlorobenzene	A	50.0	47	1.835363	1.738657		-5.3	20
1,4-Dichlorobenzene	A	50.0	47	1.862128	1.734487		-6.9	20
1,2-Dichlorobenzene	A	50.0	47	1.686558	1.589484		-5.8	20
1,2-Dibromo-3-chloropropane	A	50.0	56	0.1220866	0.1363799		11.7	20
1,2,3-Trichlorobenzene	A	50.0	56	0.8765956	0.9822859		12.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

YES NO N/A

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

ACTION: Circle all outliers with a red pencil.

ACTION: If the % RSD is > 20.0%, or > 30% for the 6 compounds in 14.3 above, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

14.4 Was the % RSD determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the linearity of the initial calibration? Document any effects to the case in the Data Assessment.

14.5 Are there any transcription/calculation errors in the reporting of RRF or % RSD? (Check at least two values but if errors are found, check more.) [ ] [✓] ___

ACTION: Circle errors with a red pencil.

ACTION: If errors are large, take action as specified in section 3.2 above.

15.0 GC/MS Calibration Verification (CLP Form VII Equivalent)

YES NO N/A

15.1 Are the Calibration Verification reporting forms present and complete for all compounds of interest? [✓] ___ ___

15.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument? [✓] ___ ___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

_____

ACTION: If any forms are missing or no calibration verification standard has been analyzed twelve hours prior to sample analysis, take action as specified in section 3.2 above. If calibration verification data are not available, flag all associated sample data as unusable ("R").

15.3 Was the % D determined from the calibration verification determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the calibration verification? Document any effects to the case in the Data Assessment.

15.4 Do any volatile compounds have a % D (difference or drift) between the initial and continuing RRF or CF which exceeds 20% (SW-846, page 8260B-19, section 7.4.5.2). [✓] ___ ___

0703/13

NOTE: (Method Requirement) For the following CCC compounds, the %D values must be ≤ 20.0%. If %D values reported are > 20.0% document in the Data Assessment.

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

YES NO N/A

ACTION: Circle all outliers with a red pencil.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated, "J". When %D is above 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

15.5 Do any volatile compounds have a RRF < 0.05? [✓] ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list for each calibration verification. If average RRF values reported are below the listed values document in the data assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with a red pencil.

ACTION: If RRF < 0.05, or < the requirements for the 5 compounds is section 15.5 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

16.0 Internal Standards (CLP Form VIII Equivalent)

16.1 Are the internal standard (IS) areas on the internal standard reporting forms of every sample and blank within the upper and lower limits (-50% to + 100%) for each initial mid-point calibration (SW-846, 8260B-20, Sect. 7.4.7)? [✓] ___ ___

YES NO N/A

ACTION: If errors are large or information is missing, take action as specified in section 3.2 above.

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area Lower Limit	Area Upper Limit

(Attach additional sheets if necessary.)

ACTION:

1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.

2. Do not qualify non-detects when the associated IS are counts area > + 100%.

3. If the IS area is below the lower limit (< -50%), qualify all associated non-detects (U-values) "J".

4. If extremely low area counts are reported (< -25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable "R" and positive results as estimated "J".

16.2 Are the retention times of all internal standards within 30 seconds of the associated initial mid-point calibration standard (SW-846, 8260B-20, Sect. 7.4.6)? [✓] ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

YES NO N/A

17.0 Field Duplicates

17.1 Were any field duplicates submitted for volatile analysis? ✓ ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the Data Assessment. However, if large differences exist, take action specified in section 3.2 above.

VENO-SD01-000H
VENO-SD01P-000H > See attached sheet

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VENO-SD01-000H
Duplicate Sample ID: VENO-SD01P-000H

Water: RPD>30%
Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
2-butanone		0.0049	200
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: Qualify 2-butanone results as estiamted (J/UJ)

* one of the results below the LOD
if both results are below the LOD the results are not compared

LOD Verification

Laboratory: ENCO

Sample ID: VENO-SD01-000H
Compound: acetone
Reported LOD: 0.023 ug/Kg

Compound	Blank LOD	Sample LOD	% Moisture	Sample Size	Calculated LOD
acetone	0.012	0.023	45.07	4.92	0.02

DataQual

From: Marcia Colon <mcolon@encolabs.com>
Sent: Wednesday, July 03, 2013 2:00 PM
To: 'DataQual'
Cc: Juliana.Dean@ch2m.com; 'Michael Zamboni'; 'Jacqueline Cleveland'
Subject: RE: CTO-037 La Chiva VOA fraction

Hi Laura-These samples were not rerun for the low 4-BFB. The other 2 surrogates were within acceptable limits and since the 4-BFB only failed minimally the analyst did not rerun. The soils were problematic for SVOC and pesticide and thus the analyst feels that the low 4-BFB recovery could be attributed to the matrix interference.

Let me know if you need more information, I'll be out Friday but back Monday.

Happy 4th!!
Marcia

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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ENCO is an eco-friendly lab offering paperless service options, please contact me anytime with questions.

From: DataQual [mailto:dataqual@charter.net]
Sent: Wednesday, July 03, 2013 12:38 PM
To: Marcia Colon
Cc: Juliana.Dean@ch2m.com; Michael Zamboni; Jacqueline Cleveland
Subject: CTO-037 La Chiva VOA fraction

Hi Marcia,

The following questions are for project CTO-037 East Vieques La Chiva concerning the **VOA fraction** data packages.

SDG# A302870

- Sample VENO-SD04-000H (A302870-05) exhibited a low surrogate recovery. I am not finding that the sample was re-analyzed. Please check if the sample was re-analyzed and if so please provide the sample analysis and all associated forms.

SDG# A302428

- Sample VENO-SD02-0H01 (A302428-13) exhibited a low surrogate recovery. I am not finding that the sample was re-analyzed. Please check if the sample was re-analyzed and if so please provide the sample analysis and all associated forms.

SDG# A302857

- Samples VENO-SD11-0H01 (A302857-01) and VENO-SD09-000H (A302857-05exhibited a low surrogate recovery. I am not finding that these samples were re-analyzed. Please check if the samples were re-analyzed and if so please provide the sample analyses and all associated forms.

If there are any questions concerning these issues please feel free to contact me.

Thank you,
Laura

Laura Maschhoff
DataQual Environmental Services, LLC
dataqual@charter.net
314-330-1327

YES NO N/A

E - The concentration of this analyte exceeds the calibration range of the instrument.

A - Indicates a Tentatively Identified Compound (TIC) is a suspected adol-condensation product.

X,Y,Z- Laboratory defined flags. The data reviewer must change these qualifiers during validation so that the data user may understand their impact on the data.

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: A302428 LAB: ENCO

SITE NAME: East Vieques La Chiva SWMU 1

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format? ✓ ___ ___

ACTION: If not, note the effect on review of the data in the data assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? ✓ ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? ✓ ___ ___

YES NO N/A

II. SEMIVOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Report Forms present for all samples? ✓ [ ] ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ___ [ ] ___

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, all non-detects data are qualified as unusable (R), and detects are flagged "J".

See attached sheet

ACTION: If samples were not iced, or if the ice was melted upon arrival at the laboratory and the cooler temperature was elevated (10°C), flag all positive results "J" and all non-detects "UJ".

temp 2°C

2.0 Holding Times

2.1 Have any semivolatile technical holding times, determined from date of collection to date of extraction, been exceeded? ___ [ ] ___

Continuous extraction of water samples for semivolatile analysis must be started within **7** days of the date of collection. Soil/sediment samples must be extracted within **14** days of collection. Extracts must be analyzed within

See attached form

YES NO N/A

40 days of the date of extraction.

Table of Holding Time Violations

Sample ID	Sample Matrix	Date Sampled	Date Lab Received	(See Traffic Report) Date Extracted	Date Analyzed
		See attached form			

ACTION: If technical holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all results should be qualified "J", but the reviewer may determine that non-detect data are unusable ("R"). If holding times are exceeded by more than 28 days, all non-detect data are unusable (R).

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 302428

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	% Moisture
VENO-SD02-000H	53.08
VENO-SD03-000H	53.85
VENO-SD12-000H	60.87

HOLDING TIME SUMMARY

EPA 8270D

Laboratory: ENCO Orlando

SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
Veno-SD01-000H	05/15/13 10:30	05/16/13 09:25	05/22/13 09:00	7.00	14.00	06/03/13 13:36	12.00	40.00	
Veno-SD01-000H RE	05/15/13 10:30	05/16/13 09:25	06/07/13 09:45	23.00	14.00	06/10/13 18:04	3.00	40.00	* J/UJ
Veno-SD01P-000H	05/15/13 10:30	05/16/13 09:25	05/22/13 09:00	7.00	14.00	06/03/13 14:04	12.00	40.00	
Veno-SD01-0H01	05/15/13 10:45	05/16/13 09:25	05/22/13 09:00	7.00	14.00	06/03/13 14:33	12.00	40.00	
Veno-SD02-000H	05/15/13 09:15	05/16/13 09:25	05/22/13 09:00	7.00	14.00	06/03/13 13:07	12.00	40.00	
Veno-SD03-000H	05/15/13 08:15	05/16/13 09:25	05/22/13 09:00	7.00	14.00	06/03/13 15:01	12.00	40.00	
Veno-SD12-000H	05/15/13 08:30	05/16/13 09:25	05/22/13 09:00	7.00	14.00	06/03/13 15:32	12.00	40.00	
Veno-SD02-0H01	05/15/13 10:00	05/16/13 09:25	05/22/13 09:00	7.00	14.00	06/03/13 16:01	12.00	40.00	
Veno-EB01-051513-SD	05/15/13 07:00	05/16/13 09:25	05/22/13 01:30	7.00	7.00	06/05/13 14:06	14.00	40.00	

RE sample not used

	YES	NO	N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Have the semi volatile surrogate recoveries been listed on CLP Surrogate Recovery forms (Form II) for each of the following matrices:

a. Low Water	✓		
b. Low/Med Soil	✓		

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery Summary forms for each matrix:

a. Low Water	✓		
b. Low/Med Soil	✓		

ACTION: If CLP deliverables are unavailable, document the effect(s) in data assessments. In some cases the lab may have to be contacted to obtain the data necessary to complete the validation.

3.3 Were outliers marked correctly with an asterisk?	✓		

ACTION: Circle all outliers in red.

3.4 Were two or more base neutral OR acid surrogate recoveries out of specification for any sample or method blank (Reviewer should use lab in house recovery limits. Use surrogate recovery limits from USEPA National Functional Guidlines January 2005 page 130, if in house limits are not available. See Method 8000B-43 or 80000C-24).	✓		

Note: Examine lab in house limits for reasonableness.

If yes, were samples re-analyzed?	✓		

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24398	Instrument:	OSVGCMS1
Matrix:	Soil	Calibration:	1304084

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (3E22007-MSD1)			Lab File ID: 1f3008.D		Analyzed: 06/03/13 12:39			
2-Fluorophenol	3.54	64	35 - 105	5.327	5.3845	-0.0575	+/-0.5	
Phenol-d5	3.54	64	40 - 100	6.406	6.4685	-0.0625	+/-0.5	
Nitrobenzene-d5	3.54	69	35 - 100	7.546	7.626	-0.0800	+/-0.5	
2-Fluorobiphenyl	3.54	63	45 - 105	9.775	9.8535	-0.0785	+/-0.5	
2,4,6-Tribromophenol	3.54	79	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	3.54	91	30 - 125	14.5	14.57375	-0.0738	+/-0.5	
Veno-SD02-000H (A302428-10)			Lab File ID: 1f3009.D		Analyzed: 06/03/13 13:07			
2-Fluorophenol	3.51	42	35 - 105	5.317	5.3845	-0.0675	+/-0.5	
Phenol-d5	3.51	45	40 - 100	6.396	6.4685	-0.0725	+/-0.5	
Nitrobenzene-d5	3.51	32	35 - 100	7.536	7.626	-0.0900	+/-0.5	*
2-Fluorobiphenyl	3.51	26	45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	3.51	44	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	3.51	74	30 - 125	14.5	14.57375	-0.0738	+/-0.5	
Veno-SD01-000H (A302428-07)			Lab File ID: 1f3010.D		Analyzed: 06/03/13 13:36			
2-Fluorophenol	3.00	45	35 - 105	5.317	5.3845	-0.0675	+/-0.5	
Phenol-d5	3.00	52	40 - 100	6.396	6.4685	-0.0725	+/-0.5	
Nitrobenzene-d5	3.00	35	35 - 100	7.546	7.626	-0.0800	+/-0.5	
2-Fluorobiphenyl	3.00	19	45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	3.00	46	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	3.00	58	30 - 125	14.5	14.57375	-0.0738	+/-0.5	
Veno-SD01P-000H (A302428-08)			Lab File ID: 1f3011.D		Analyzed: 06/03/13 14:04			
2-Fluorophenol	2.98	40	35 - 105	5.317	5.3845	-0.0675	+/-0.5	
Phenol-d5	2.98	46	40 - 100	6.396	6.4685	-0.0725	+/-0.5	
Nitrobenzene-d5	2.98	34	35 - 100	7.536	7.626	-0.0900	+/-0.5	*
2-Fluorobiphenyl	2.98	25	45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	2.98	45	35 - 125	11.634	11.72025	-0.0862	+/-0.5	
Terphenyl-d14	2.98	58	30 - 125	14.5	14.57375	-0.0738	+/-0.5	
Veno-SD01-0H01 (A302428-09)			Lab File ID: 1f3012.D		Analyzed: 06/03/13 14:33			
2-Fluorophenol	2.69	31	35 - 105	5.317	5.3845	-0.0675	+/-0.5	*
Phenol-d5	2.69	36	40 - 100	6.396	6.4685	-0.0725	+/-0.5	*
Nitrobenzene-d5	2.69	29	35 - 100	7.536	7.626	-0.0900	+/-0.5	*
2-Fluorobiphenyl	2.69	23	45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	2.69	35	35 - 125	11.634	11.72025	-0.0862	+/-0.5	
Terphenyl-d14	2.69	81	30 - 125	14.5	14.57375	-0.0738	+/-0.5	

J/UJ B/N

Ma

J/UJ B/N

J/UJ all

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24398	Instrument:	OSVGCMS1
Matrix:	Soil	Calibration:	1304084

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Veno-SD03-000H (A302428-11)			Lab File ID: 1f3013.D		Analyzed: 06/03/13 15:01			
2-Fluorophenol	3.58	44	35 - 105	5.317	5.3845	-0.0675	+/-0.5	
Phenol-d5	3.58	53	40 - 100	6.396	6.4685	-0.0725	+/-0.5	
Nitrobenzene-d5	3.58	35	35 - 100	7.546	7.626	-0.0800	+/-0.5	
2-Fluorobiphenyl	3.58	25	45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	3.58	52	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	3.58	77	30 - 125	14.5	14.57375	-0.0738	+/-0.5	
Veno-SD12-000H (A302428-12)			Lab File ID: 1f3014.D		Analyzed: 06/03/13 15:32			
2-Fluorophenol	4.23	32	35 - 105	5.317	5.3845	-0.0675	+/-0.5	*
Phenol-d5	4.23	35	40 - 100	6.396	6.4685	-0.0725	+/-0.5	*
Nitrobenzene-d5	4.23	27	35 - 100	7.546	7.626	-0.0800	+/-0.5	*
2-Fluorobiphenyl	4.23	21	45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	4.23	29	35 - 125	11.644	11.72025	-0.0762	+/-0.5	*
Terphenyl-d14	4.23	52	30 - 125	14.5	14.57375	-0.0738	+/-0.5	
Veno-SD02-0H01 (A302428-13)			Lab File ID: 1f3015.D		Analyzed: 06/03/13 16:01			
2-Fluorophenol	3.04	31	35 - 105	5.317	5.3845	-0.0675	+/-0.5	*
Phenol-d5	3.04	35	40 - 100	6.396	6.4685	-0.0725	+/-0.5	*
Nitrobenzene-d5	3.04	30	35 - 100	7.536	7.626	-0.0900	+/-0.5	*
2-Fluorobiphenyl	3.04	29	45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	3.04	38	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	3.04	66	30 - 125	14.5	14.57375	-0.0738	+/-0.5	

Ma

J/UJ all

J/UJ all

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24468	Instrument:	OSVGCMS1
Matrix:	Soil	Calibration:	1304084

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Veno-SD01-000H (A302428-07RE1)			Lab File ID: 1fe016.D		Analyzed: 06/10/13 18:04			
2-Fluorophenol	3.03	62	35 - 105	5.227	5.3845	-0.1575	+/-0.5	
Phenol-d5	3.03	75	40 - 100	6.316	6.4685	-0.1525	+/-0.5	
Nitrobenzene-d5	3.03	48	35 - 100	7.456	7.626	-0.1700	+/-0.5	
2-Fluorobiphenyl	3.03	22	45 - 105	9.691	9.8535	-0.1625	+/-0.5	*
2,4,6-Tribromophenol	3.03	66	35 - 125	11.544	11.72025	-0.1763	+/-0.5	
Terphenyl-d14	3.03	55	30 - 125	14.399	14.57375	-0.1748	+/-0.5	

RE sample not used in favor of initial analy

	YES	NO	N/A
Were method blanks re-analyzed?	✓		

ACTION: If all surrogate recoveries are > 10% but two within the base-neutral or acid fraction do not meet method specifications, <u>for the affected fraction only (i.e. either base-neutral or acid compounds):</u>

1. Flag all positive results as estimated ("J").

2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.

3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects.

If any base-neutral <u>or</u> acid surrogate has a recovery of < 10%:

1. Positive results for the fraction with < 10% surrogate recovery are qualified with "J".

2. Non-detects for that fraction should be qualified as unusable (R) .

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. Check the internal standard areas.

	YES	NO	N/A
3.5 Are there any transcription/calculation errors between raw data and Form II?		✓	

ACTION: If large errors exist, call lab for explanation/resubmittal, make any necessary corrections and document

YES NO N/A

effect in data assessments.

4.0 Matrix Spikes (Form III/Equivalent) VEND-SD02-000H

4.1 Have the semivolatile Matrix Spike and Matrix Spike Duplicate/or duplicate unspiked Sample recoveries been listed on the Recovery Form (Form III)? [✓] ___ ___

NOTE: Method 3500B/page 4 states the spiking compounds:

Base/neutrals	Acids
1,2,4-Trichlorobenzene	Pentachlorophenol
Acenaphthene	Phenol
2,4-Dinitrotoluene	2-Chlorophenol
Pyrene	4-Chloro-3-methylphenol
N-Nitroso-di-n-propylamine	4-Nitrophenol
1,4-Dichlorobenzene	

Note: Some projects may require the spiking of specific compounds of interest.

Note: See Method 8270D-sec 8.4.2 for deciding on whether to prepare and analyze duplicate samples or a martix spike/matrix spike duplicate. If samples are expected to contain target analytes, then laboratory may use one matrix spike and a duplicate analysis of an unspiked field sample. If samples are not expected to contain target analytes, laboratory should use a matrix spike and matrix spike duplicate pair.

4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Low Water [ ] ___ ___

b. Low Solid [✓] ___ ___

c. Med Solid [ ] ___ ___

YES NO N/A

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above. It may be necessary to contact the lab to obtain the required data.

NOTE: If the data has not been reported on CLP equivalent form, then the laboratory must provide the information necessary to evaluate the spike recoveries in the MS and MSD. The required data which should have been provided by the lab include the analytes and concentrations used for spiking, background concentrations of the spiked analytes (i.e., concentrations in unspiked sample), methods and equations used to calculate the QC acceptance criteria for the spiked analytes, percent recovery data for all spiked analytes.

The data reviewer must verify that all reported equations and percent recoveries are correct before proceeding to the next section.

4.3 Were matrix spikes performed at concentration equal to 100ug/L for acid compounds, and 200ug/l for base compounds (Method 3500B-4), or those specified in project plan. ✓ ___ ___

4.4 How many semivolatile spike recoveries are outside Laboratory in house MS/MSD recovery limits (use recovery limits values in Method 8270D-43&44 Table 6 if in house values not available).

Water

____ out of ____

Solids

0 out of 98

YES NO N/A

4.5 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water

____ out of ____

Solids

0 out of 49

ACTION: Circle all outliers with red pencil.

ACTION: No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the matrix spike and matrix spike duplicate results in conjunction with other QC criteria to determine the need for some qualification of the data.

4.6 Was a Laboratory Control Sample (LCS) analyzed with each analytical batch? [✓] ___ ___

NOTE: When the results of the matrix spike analysis indicate a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

5.0 Blanks (Form IV/Equivalent)

5.1 Is the Method Blank Summary (Form IV) present? [✓] ___ ___

5.2 Frequency of Analysis:

Has a reagent/method blank analysis been reported per 20 samples of similar matrix, or concentration level, and for each extraction batch? [✓] ___ ___

5.3 Has a method blank been analyzed either after

	YES	NO	N/A
the calibration standard or at any other time during the analytical shift for each GC/MS system used ?	✓		

ACTION: If any method blank data are missing, call lab for explanation/resubmittal. If not available, use professional judgement to determine if the associated sample data should be qualified.

5.4 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra.

	YES	NO	N/A
Is the chromatographic performance (baseline stability) for each instrument acceptable for the semivolatiles?	✓		

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

	YES	NO	N/A
6.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary.		✓	
6.2 Do any field/rinse/ blanks have positive results for target analytes and/or TICs (if required, see section 10 below)?		✓	

VENO-EB01-051513-SD MO

YES NO N/A

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case) must be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field Blanks must be qualified for outlying surrogates, poor spectra, instrument performance or calibration QC problems.

ACTION: Follow the directions in the table below to qualify sample results due to contamination. Use the largest value from all the associated blanks. If gross contamination exists, all data in the associated samples should be qualified as unusable (R).

YES NO N/A

Blank Action for Semivolatile Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Field	Detects	Not detected	No qualification required
	< CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	= CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	> CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report concentration of sample with a U
		≥ CRQL and ≥ blank contamination	No qualification required

NOTE: Analytes qualified "U" for blank contamination are still considered as "hits" when qualifying for calibration criteria.

NOTE: If the laboratory did not report TIC analyses, check the project plans to verify whether or not it was required.

6.3 Are there field/rinse/equipment blanks associated with every sample? ✓ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

6.4 Was a instrument blank analyzed after each sample/dilution which contained a target compound

	YES	NO	N/A
that exceeded the initial calibration range.	[ ]	___	✓
6.5 Does the instrument blank have positive results for target analytes and/or TICs?	___	[ ]	✓

Note: Use professional judgement to determine if carryover occurred and qualify analytes accordingly.

7.0 GC/MS Apparatus and Materials

	YES	NO	N/A
7.1 Did the lab use the proper gas chromatographic column for analysis of semivolatiles by Method 8270D? Check raw data, instrument logs or contact the lab to determine what type of column was used. The method requires the use of 30 m x 0.25 mm ID (or 0.32 mm ID), silicone-coated, fused silica, capillary column.	✓	___	___

ACTION: If the specified column, or equivalent, was not used, document the effects in the data assessment. Use professional judgement to determine the acceptability of the data.

8.0 GC/MS Instrument Performance Check (Form V/Equivalent)

	YES	NO	N/A
8.1 Are the GC/MS Instrument Performance Check Forms (Form V) present for decafluorotriphenylphosphine (DFTPP)?	✓	___	___

NOTE: The performance solution should also contain 4,4-DDT, pentachlorophenol, and benzidine to verify injection port inertness and column performance. The degradation of DDT to DDE and DDD must be less than 20% total and the response of pentachlorophenol and benzidine should be within normal ranges for these compounds (based upon lab experience) and show no peak degradation or tailing before samples are analyzed. (see section 5.5

	YES	NO	N/A
page 8270D-12).			
8.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve hour shift?	[✓]	___	___
8.3 Has an instrument performance check solution been analyzed for every twelve hours of sample analysis per instrument?	[✓]	___	___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

ACTION: If lab cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable (R).

8.4 Have the ion abundances been normalized to m/z 198?	[✓]	___	___
8.5 Have the ion abundance criteria been met for each instrument used?	[✓]	___	___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

	YES	NO	N/A
ACTION: If ion abundance criteria are not met, take action specified in section 3.2			
8.6 Are there any transcription/calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.)	___	[✓]	___
8.7 Have the appropriate number of significant figures (two) been reported?	[✓]	___	___
ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document effect in data assessments.			
8.8 Are the spectra of the mass calibration compound acceptable?	[✓]	___	___
ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.			
9.0 Target Analytes			
9.1 Are the Organic Analysis Data Sheets (Form I) present with required header information on each page, for each of the following:			
a. Samples and/or fractions as appropriate	[✓]	___	___
b. Matrix spikes and matrix spike duplicates	[✓]	___	___
c. Blanks	[✓]	___	___
9.2 Has any special cleanup, such as GPC, been performed on all soil/sediment sample extracts (see section 7.2, page 8270D-14)?	[ ]	[✓]	___

	YES	NO	N/A
ACTION: If data suggests that extract cleanup was not performed, use professional judgement. Make note in the data assessment narrative.			
9.3 Are the Reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?			
a. Samples and/or fractions as appropriate	[✓]	___	___
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)	[✓]	___	___
c. Blanks	[✓]	___	___
ACTION: If any data are missing, take action specified in 3.2 above.			
9.4 Are the response factors shown in the Quant Report?	[✓]	___	___
9.5 Is chromatographic performance acceptable with respect to:			
Baseline stability?	[✓]	___	___
Resolution?	[✓]	___	___
Peak shape?	[✓]	___	___
Full-scale graph (attenuation)?	[✓]	___	___
Other:_____	[ ]	___	___
ACTION: Use professional judgement to determine the acceptability of the data.			
9.6 Are the lab-generated standard mass spectra of identified semivolatile compounds present for			

	YES	NO	N/A
each sample?	✓		

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the data assessment narrative. If spectra are missing, reject all positive data.

	YES	NO	N/A
9.7 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	✓		
9.8 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum?	✓		
9.9 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum?	✓		

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected (R), flagged "N" (Presumptive evidence of the presence of the compound) or changed to not detected (U) at the calculated detection limit. In order to be positively identified, the data must comply with the criteria listed in 9.7, 9.8, and 9.9.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

	YES	NO	N/A

10.0 Tentatively Identified Compounds (TIC)

No TICs

10.1 If Tentatively Identified Compounds were required for this project, are all Form Is, Part B present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier?

NOTE: Review sampling reports to determine if the lab was required to identify non target analytes (refer to section 7.6.2,page 8270D-21).

	YES	NO	N/A
10.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:	[ ]	___	✓
a. Samples and/or fractions as appropriate	[ ]	___	✓
b. Blanks	[ ]	___	✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by CAS #.

	YES	NO	N/A
10.3 Are any target compounds from one fraction listed as TIC compounds in another (e.g., an acid compound listed as a base neutral TIC)?	___	[ ]	✓

ACTION: i. Flag with "R" any target compound listed as a TIC.

ii. Make sure all rejected compounds are properly reported in the other fraction.

10.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the

	YES	NO	N/A
sample mass spectrum?	[ ]	___	✓
10.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%?	[ ]	___	✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate and remove "JN". Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R."

11.0 Compound Quantitation and Reported Detection Limits

	YES	NO	N/A
11.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I result. Were any errors found?	___	[✓]	___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

	YES	NO	N/A
11.2 Are the method detection limits adjusted to reflect sample dilutions and, for soils, sample moisture?	[✓]	___	___

YES NO N/A

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC exceedance dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original Form I (if present) and substituting the data from the analysis of the diluted sample. Specify which Form I is to be used, then draw a red " X" across the entire page of all Form I's that should not be used, including any in the summary package.

12.0 Standards Data (GC/MS)

12.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant, Reports) present for initial and continuing calibration? [✓] ___ ___

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

13.0 GC/MS Initial Calibration (Form VI/Equivalent)

13.1 Is the Initial Calibration Form (Form VI/ Equivalent) present and complete for the semivolatile fraction? [✓] ___ ___

ACTION: If any calibration forms or standard row data are missing, take action specified in 3.2 above.

13.2 Are all base neutral or acid RRFs > 0.050? [✓] ___ ___

YES NO N/A

Check the **average RRFs** of the four System Performance Check Compounds (SPCCs): N-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, and 4-nitrophenol. These compounds must have **average RRFs** greater than or equal to 0.05 before running samples and should not show any peak tailing.

ACTION: Circle all outliers in red.

ACTION: For any target analyte with **average RRF <0.05**

1. "R" all non-detects;

2. "J" all positive results.

13.3 Are response factors for base neutral or acid target analytes stable over the concentration range of the calibration (% Relative standard deviation [%RSD] < 20.0%)? [ ] ✓ ___ ___

NOTE: The % RSD for each individual Calibration Check Compound (CCC, Method 8270D-40 see Table 4) must be less than 30% before analysis can begin. If grater 30%, the lab must clean and recalibrate the instrument.

CALIBRATION CHECK COMPOUNDS

Base/Neutral Fraction	Acid Fraction
Acenaphthene	4-Chloro-3-methylphenol
1,4-Dichlorobenzene	2,4-Dichlorophenol
Hexachlorobutadiene	2-Nitrophenol
Diphenylamine	Phenol
Di-n-octyl phthalate	Pentachlorophenol
Fluoranthene	2,4,6-Trichlorophenol

YES NO N/A

Benzo(a)pyrene

ACTION: If the %RSD for any CCC >30% and no corrective action taken, then "J" qualify all positive hits and "UJ" qualify all non-detects.

ACTION: Circle all outliers in red.

ACTION: If the % RSD is ≥ 20.0%, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, flag all non- detect results for that analyte "R," unusable. Alternatively, the lab should calculate first or second order regression fit of the calibration curve and select the fit which introduces the least amount of error.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

13.4 Did the laboratory calculate the calibration curve by the least squares regression fit? ___ [✓] ___

13.5 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or % RSD? (Check at least two values but if errors are found, check more.) ___ [✓] ___

ACTION: Circle Errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and note errors in data assessments.

13.5 Do the target compounds for this SDG include Pesticides? [ ] ___ [✓]

	YES	NO	N/A
13.6 If the pesticide compounds include DDT, was the percent breakdown of DDT to DDD and DDE greater than 20%?	___	[ ]	✓

ACTION: If DDT percent breakdown exceeds 20%:

i. Qualify all positive results for DDT with "J". If DDT was not detected, but DDD and DDE results are positive, qualify the quantitation limit for DDT as unusable, "R".

ii. Qualify all positive results for DDD and DDE as presumptively present at an approximate concentration "JN".

14.0 GC/MS Calibration Verification (Form VII/Equivalent)

14.1 Are the Calibration Verification Forms (Form VII) present and complete for all compounds of interest?	✓	___	___
14.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument?	✓	___	___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

_____

_____

_____

ACTION: If any forms are missing or no calibration verification standard has been analyzed within twelve hours of every sample analysis,

	YES	NO	N/A
call lab for explanation/resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable ("R").			
14.3 Do any of the SPCCs have an RRF <0.05?		✓	
If YES, make a note in data assessment if the lab did not take corrective action specified in section 7.4.4, page 8270D-18.		✓	
14.4 Do any of the CCCs have a %D between the initial and continuing RRF which exceeds 20.0%?			
ACTION: If yes, make a note in data assessment.			
14.5 Do any semivolatile compounds have a % Difference (% D) between the initial and continuing RRF which exceeds 20.0%?	✓		
ACTION: Circle all outliers in red.			
ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated (J). When %D is above 90%, qualify all non-detects for that analyte as "R", unusable.			
14.6 Do any semivolatile compounds have a RRF < 0.05?		✓	
ACTION: Circle all outliers in red.			
ACTION: If RRF < 0.05, qualify as unusable ("R") associated non-detects and "J" associated positive values.			
14.7 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or percent difference (%D) between initial and continuing RRFs? (Check at least two values but if errors are found, check more).		✓	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA23913	Instrument:	OSVGCMS1
		Calibration:	1304084

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA23913-TUN1	1dr001.D	04/24/13 10:27
Cal Standard	AA23913-CAL6	1dr008.D	04/24/13 13:31
Cal Standard	AA23913-CAL7	1dr009.D	04/24/13 13:59
Cal Standard	AA23913-CAL8	1dr010.D	04/24/13 14:27
Cal Standard	AA23913-CAL9	1dr011.D	04/24/13 14:55
Cal Standard	AA23913-CALA	1dr012.D	04/24/13 15:23
Cal Standard	AA23913-CALB	1dr013.D	04/24/13 15:51
Secondary Cal Check	AA23913-SCV2	1dr014.D	04/24/13 16:20
Cal Standard	AA23913-CALC	1dr015.D	04/24/13 16:48
Cal Standard	AA23913-CALD	1dr016.D	04/24/13 17:16
Cal Standard	AA23913-CALE	1dr017.D	04/24/13 17:44
Cal Standard	AA23913-CALF	1dr018.D	04/24/13 18:12
Cal Standard	AA23913-CALG	1dr019.D	04/24/13 18:41
Cal Standard	AA23913-CALH	1dr020.D	04/24/13 19:09
Cal Standard	AA23913-CALI	1dr021.D	04/24/13 19:37
Cal Standard	AA23913-CALJ	1dr022.D	04/24/13 20:05
Secondary Cal Check	AA23913-SCV3	1dr023.D	04/24/13 20:33

All samples

INITIAL CALIBRATION DATA (Continued)

EPA 8270D

Laboratory: ENCO Orlando

SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Calibration: 1304084

Instrument: OSVGCMS1

Matrix: Water

Calibration Date: 04/25/13 14:38

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
4-Chloroaniline	0.420784	10.81733	8.596875	0.1299278			15	
4-Chloroaniline	0.420784	10.81733	8.596875	0.1299278			15	
Hexachlorobutadiene	0.133537	11.14084	8.696125	3.570073E-02			CCC (30)	
Hexachlorobutadiene	0.133537	11.14084	8.696125	3.570073E-02			CCC (30)	
Caprolactam	0.1023145	7.930677	9.0035	0.2410231	0.9997362		0.995	
Caprolactam	0.1023145	7.930677	9.0035	0.2410231	0.9997362		0.995	
4-Chloro-3-methylphenol	0.2875731	5.662493	9.173125	0.1065105			CCC (30)	
4-Chloro-3-methylphenol	0.2875731	5.662493	9.173125	0.1065105			CCC (30)	
Hexachlorocyclopentadiene	0.160971	3.91213	9.6115	5.126929E-02			SPCC (0.05)	
Hexachlorocyclopentadiene	0.160971	3.91213	9.6115	5.126929E-02			SPCC (0.05)	
1,2,4,5-Tetrachlorobenzene	0.5777248	12.52696	9.624429	6.801648E-02			15	
1,2,4,5-Tetrachlorobenzene	0.5777248	12.52696	9.624429	6.801648E-02			15	
2,4,6-Trichlorophenol	0.3906062	2.717846	9.7515	5.009164E-02			CCC (30)	
2,4,6-Trichlorophenol	0.3906062	2.717846	9.7515	5.009164E-02			CCC (30)	
2,4,5-Trichlorophenol	0.4048454	6.596888	9.796625	0.1011245			15	
2,4,5-Trichlorophenol	0.4048454	6.596888	9.796625	0.1011245			15	
1,1'-Biphenyl	1.408911	14.49249	9.982667	4.906209E-02			15	
1,1'-Biphenyl	1.408911	14.49249	9.982667	4.906209E-02			15	
2-Nitroaniline	0.2872128	6.284036	10.13212	9.884085E-02			15	
2-Nitroaniline	0.2872128	6.284036	10.13212	9.884085E-02			15	
Dimethylphthalate	1.380391	6.878142	10.346	0.1170416			15	
Dimethylphthalate	1.380391	6.878142	10.346	0.1170416			15	
2,6-Dinitrotoluene	0.321366	5.339978	10.42987	0.1170326			15	
2,6-Dinitrotoluene	0.321366	5.339978	10.42987	0.1170326			15	
3-Nitroaniline	0.2941958	9.995937	10.6465	0.1019011			15	
3-Nitroaniline	0.2941958	9.995937	10.6465	0.1019011			15	
2,4-Dinitrophenol	0.1094045	37.65892	10.77271	0.1071948	J/US	0.9956609	SPCC (0.05)	
2,4-Dinitrophenol	0.1094045	37.65892	10.77271	0.1071948		0.9956609	SPCC (0.05)	
4-Nitrophenol	0.1206959	13.08687	10.83529	0.1667762			SPCC (0.05)	
4-Nitrophenol	0.1206959	13.08687	10.83529	0.1667762			SPCC (0.05)	
Dibenzofuran	1.550377	12.47786	10.98488	6.975772E-02			15	
Dibenzofuran	1.550377	12.47786	10.98488	6.975772E-02			15	

INITIAL CALIBRATION DATA (Continued)

EPA 8270D

Laboratory: ENCO Orlando

SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Calibration: 1304084

Instrument: OSVGCMS1

Matrix: Soil

Calibration Date: 04/25/13 14:38

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
2,4-Dinitrotoluene	0.3453686	11.07432	10.9405	0.1387042			15	
2,4-Dinitrotoluene	0.3453686	11.07432	10.9405	0.1387042			15	
2,3,4,6-Tetrachlorophenol	0.2947519	7.254076	11.1305	4.339181E-02			15	
2,3,4,6-Tetrachlorophenol	0.2947519	7.254076	11.1305	4.339181E-02			15	
Diethylphthalate	1.313816	11.00762	11.22375	9.913253E-02			15	
Diethylphthalate	1.313816	11.00762	11.22375	9.913253E-02			15	
4-Chlorophenyl-phenylether	0.6288451	10.68041	11.3905	6.295195E-02			15	
4-Chlorophenyl-phenylether	0.6288451	10.68041	11.3905	6.295195E-02			15	
4-Nitroaniline	0.2551348	8.570398	11.42925	0.1868726			15	
4-Nitroaniline	0.2551348	8.570398	11.42925	0.1868726			15	
2-Methyl-4,6-dinitrophenol	0.1790558	30.22664	11.458	0.1193095	JNJ	0.9979228	0.99	
2-Methyl-4,6-dinitrophenol	0.1790558	30.22664	11.458	0.1193095		0.9979228	0.99	
N-nitrosodiphenylamine/Diphenylamine	0.9340443	13.85035	11.53729	0.0993536			15	
N-nitrosodiphenylamine/Diphenylamine	0.9340443	13.85035	11.53729	0.0993536			15	
4-Bromophenyl-phenylether	0.2478567	7.341758	12.01163	0.0391537			15	
4-Bromophenyl-phenylether	0.2478567	7.341758	12.01163	0.0391537			15	
Hexachlorobenzene	0.2677796	14.31915	12.12487	6.982579E-02			15	
Hexachlorobenzene	0.2677796	14.31915	12.12487	6.982579E-02			15	
Atrazine	0.3543928	5.458518	12.18083	7.041725E-02			15	
Atrazine	0.3543928	5.458518	12.18083	7.041725E-02			15	
Pentachlorophenol	0.1386658	10.69653	12.3585	7.961759E-02			CCC (30)	
Pentachlorophenol	0.1386658	10.69653	12.3585	7.961759E-02			CCC (30)	
Carbazole	0.9210803	8.251612	12.881	4.871411E-02			15	
Carbazole	0.9210803	8.251612	12.881	4.871411E-02			15	
Di-n-butylphthalate	1.318872	14.38763	13.26286	4.735941E-02			15	
Di-n-butylphthalate	1.318872	14.38763	13.26286	4.735941E-02			15	
Butylbenzylphthalate	0.3370092	6.03829	15.19925	3.254494E-02			15	
Butylbenzylphthalate	0.3370092	6.03829	15.19925	3.254494E-02			15	
3,3'-Dichlorobenzidine	0.3430223	6.014244	16.1015	3.503599E-02			15	
3,3'-Dichlorobenzidine	0.3430223	6.014244	16.1015	3.503599E-02			15	
Bis(2-ethylhexyl)phthalate	0.7507349	8.731109	16.107	1.481631E-02			15	
Bis(2-ethylhexyl)phthalate	0.7507349	8.731109	16.107	1.481631E-02			15	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270D

Laboratory: ENCO Orlando

SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Sequence: AA24398

Instrument: OSVGCMS1

Calibration: 1304084

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA24398-TUN1	1f3001.D	06/03/13 09:36
Calibration Check	AA24398-CCV1	1f3002.D	06/03/13 09:49
Calibration Check	AA24398-CCV2	1f3003.D	06/03/13 10:17
Instrument RL Check	AA24398-CRL1	1f3004.D	06/03/13 10:46
Blank	3E22007-BLK1	1f3005.D	06/03/13 11:14
LCS	3E22007-BS1	1f3006.D	06/03/13 11:42
Veno-SD02-000H	3E22007-MS1	1f3007.D	06/03/13 12:11
Veno-SD02-000H	3E22007-MSD1	1f3008.D	06/03/13 12:39
Veno-SD02-000H	A302428-10	1f3009.D	06/03/13 13:07
Veno-SD01-000H	A302428-07	1f3010.D	06/03/13 13:36
Veno-SD01P-000H	A302428-08	1f3011.D	06/03/13 14:04
Veno-SD01-0H01	A302428-09	1f3012.D	06/03/13 14:33
Veno-SD03-000H	A302428-11	1f3013.D	06/03/13 15:01
Veno-SD12-000H	A302428-12	1f3014.D	06/03/13 15:32
Veno-SD02-0H01	A302428-13	1f3015.D	06/03/13 16:01

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1f3002.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24398	Injection Date:	06/03/13
Lab Sample ID:	AA24398-CCV1	Injection Time:	09:49

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Phenol	A	50.0	47	1.689286	1.605678		-4.9	20
Bis(2-chloroethyl)ether	A	50.0	46	1.321272	1.238048		-6.3	20
2-Chlorophenol	A	50.0	49	1.533498	1.49972		-2.2	20
2-Methylphenol	A	50.0	47	1.193165	1.114891		-6.6	20
Bis(2-chloroisopropyl)ether	A	50.0	47	2.116017	2.003114		-5.3	20
Acetophenone	A	50.0	44	1.88376	1.685536		-10.5	20
3 & 4-Methylphenol	Q	100	93	1.201132	1.005152		-6.6	20
N-Nitroso-di-n-propylamine	A	50.0	46	0.8771514	0.831172	0.05	-5.2	20
Hexachloroethane	A	50.0	51	0.6637878	0.6870651		3.5	20
Nitrobenzene	A	50.0	53	0.3702381	0.3898397		5.3	20
Isophorone	A	50.0	47	0.6814322	0.6450938		-5.3	20
2-Nitrophenol	A	50.0	51	0.1975773	0.1991617		0.8	20
2,4-Dimethylphenol	A	50.0	46	0.3606494	0.3317925		-8.0	20
Bis(2-chloroethoxy)methane	A	50.0	56	0.4863715	0.525957		8.1	20
2,4-Dichlorophenol	A	50.0	47	0.3146341	0.2941624		-6.5	20
4-Chloroaniline	A	50.0	48	0.420784	0.4058986		-3.5	20
Hexachlorobutadiene	A	50.0	52	0.133537	0.1386822		3.9	20
4-Chloro-3-methylphenol	A	50.0	50	0.2875731	0.2912282		1.3	20
Hexachlorocyclopentadiene	A	50.0	46	0.160971	0.1469257	0.05	-8.7	20
1,2,4,5-Tetrachlorobenzene	A	50.0	51	0.5777248	0.5941719		2.8	20
2,4,6-Trichlorophenol	A	50.0	49	0.3906062	0.3830367		-1.9	20
2,4,5-Trichlorophenol	A	50.0	50	0.4048454	0.4084489		0.9	20
2-Nitroaniline	A	50.0	59	0.2872128	0.3393129		18.1	20
Dimethylphthalate	A	50.0	50	1.380391	1.389091		0.6	20
2,6-Dinitrotoluene	A	50.0	49	0.321366	0.3157428		-1.7	20
3-Nitroaniline	A	50.0	56	0.2941958	0.3298385		12.1	20
2,4-Dinitrophenol	Q	50.0	63	0.1094045	0.1891839	0.05	26.9	20 *
4-Nitrophenol	A	50.0	69	0.1206959	0.1716166	0.05	42.2	20 *
Dibenzofuran	A	50.0	51	1.550377	1.577133		1.7	20

JW

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1f3002.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24398	Injection Date:	06/03/13
Lab Sample ID:	AA24398-CCV1	Injection Time:	09:49

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
2,4-Dinitrotoluene	A	50.0	60	0.3453686	0.4193774		21.4	20 *	J/UJ
2,3,4,6-Tetrachlorophenol	A	50.0	55	0.2947519	0.3254578		10.4	20	
Diethylphthalate	A	50.0	52	1.313816	1.367474		4.1	20	
4-Chlorophenyl-phenylether	A	50.0	50	0.6288451	0.6264092		-0.4	20	
4-Nitroaniline	A	50.0	63	0.2551348	0.326343		27.9	20 *	J/UJ
2-Methyl-4,6-dinitrophenol	Q	50.0	54	0.1790558	0.2571171		8.2	20	
N-nitrosodiphenylamine/Diphenylam	A	100	100	0.9340443	0.9848232		5.4	20	
4-Bromophenyl-phenylether	A	50.0	46	0.2478567	0.2295137		-7.4	20	
Hexachlorobenzene	A	50.0	45	0.2677796	0.2408662		-10.1	20	
Pentachlorophenol	A	50.0	56	0.1386658	0.1569705		13.2	20	
Carbazole	A	50.0	53	0.9210803	0.9859446		7.0	20	
Di-n-butylphthalate	A	50.0	47	1.318872	1.254951		-4.8	20	
Butylbenzylphthalate	A	50.0	60	0.3370092	0.4091973		21.4	20 *	J/UJ
3,3'-Dichlorobenzidine	A	50.0	53	0.3430223	0.3645568		6.3	20	
Bis(2-ethylhexyl)phthalate	A	50.0	52	0.7507349	0.7855493		4.6	20	
Di-n-octylphthalate	Q	50.0	53	1.026902	1.300694		6.7	20	

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24423	Instrument:	OSVGCMS1
		Calibration:	1304084

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA24423-TUN1	1f5001.D	06/05/13 11:02
Calibration Check	AA24423-CCV2	1f5002.D	06/05/13 11:16
Calibration Check	AA24423-CCV1	1f5003.D	06/05/13 11:44
Instrument RL Check	AA24423-CRL1	1f5004.D	06/05/13 12:13
Blank	3E22001-BLK1	1f5005.D	06/05/13 12:41
LCS	3E22001-BS1	1f5006.D	06/05/13 13:09
LCS Dup	3E22001-BSD1	1f5007.D	06/05/13 13:38
Veno-EB01-051513-SD	A302428-14	1f5008.D	06/05/13 14:06

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1f5003.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24423	Injection Date:	06/05/13
Lab Sample ID:	AA24423-CCV1	Injection Time:	11:44

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Phenol	A	50.0	48	1.689286	1.617159		-4.3	20
Bis(2-chloroethyl)ether	A	50.0	48	1.321272	1.300908		-1.5	20
2-Chlorophenol	A	50.0	51	1.533498	1.552941		1.3	20
2-Methylphenol	A	50.0	50	1.193165	1.193457		0.02	20
Bis(2-chloroisopropyl)ether	A	50.0	50	2.116017	2.12146		0.3	20
Acetophenone	A	50.0	46	1.88376	1.74886		-7.2	20
3 & 4-Methylphenol	Q	100	97	1.201132	1.03333		-2.6	20
N-Nitroso-di-n-propylamine	A	50.0	50	0.8771514	0.8953231	0.05	2.1	20
Hexachloroethane	A	50.0	53	0.6637878	0.7037441		6.0	20
Nitrobenzene	A	50.0	52	0.3702381	0.3868131		4.5	20
Isophorone	A	50.0	52	0.6814322	0.7156853		5.0	20
2-Nitrophenol	A	50.0	51	0.1975773	0.1995943		1.0	20
2,4-Dimethylphenol	A	50.0	47	0.3606494	0.3388591		-6.0	20
Bis(2-chloroethoxy)methane	A	50.0	58	0.4863715	0.5421676		11.5	20
2,4-Dichlorophenol	A	50.0	48	0.3146341	0.3041436		-3.3	20
4-Chloroaniline	A	50.0	50	0.420784	0.4230471		0.5	20
Hexachlorobutadiene	A	50.0	51	0.133537	0.1358111		1.7	20
4-Chloro-3-methylphenol	A	50.0	57	0.2875731	0.3264283		13.5	20
Hexachlorocyclopentadiene	A	50.0	43	0.160971	0.1367276	0.05	-15.1	20
1,2,4,5-Tetrachlorobenzene	A	50.0	50	0.5777248	0.5839634		1.1	20
2,4,6-Trichlorophenol	A	50.0	51	0.3906062	0.3951695		1.2	20
2,4,5-Trichlorophenol	A	50.0	50	0.4048454	0.4031567		-0.4	20
2-Nitroaniline	A	50.0	59	0.2872128	0.3397253		18.3	20
Dimethylphthalate	A	50.0	49	1.380391	1.370197		-0.7	20
2,6-Dinitrotoluene	A	50.0	48	0.321366	0.3080651		-4.1	20
3-Nitroaniline	A	50.0	52	0.2941958	0.3090914		5.1	20
2,4-Dinitrophenol	Q	50.0	56	0.1094045	0.1677564	0.05	12.9	20
4-Nitrophenol	A	50.0	60	0.1206959	0.1497185	0.05	24.0	20 * J/UJ
Dibenzofuran	A	50.0	51	1.550377	1.577133		1.7	20

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1f5003.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24423	Injection Date:	06/05/13
Lab Sample ID:	AA24423-CCV1	Injection Time:	11:44

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
2,4-Dinitrotoluene	A	50.0	54	0.3453686	0.3773141		9.2	20
2,3,4,6-Tetrachlorophenol	A	50.0	53	0.2947519	0.3138181		6.5	20
Diethylphthalate	A	50.0	48	1.313816	1.278421		-2.7	20
4-Chlorophenyl-phenylether	A	50.0	53	0.6288451	0.667005		6.1	20
4-Nitroaniline	A	50.0	55	0.2551348	0.2838535		11.3	20
2-Methyl-4,6-dinitrophenol	Q	50.0	47	0.1790558	0.2181885		-5.9	20
N-nitrosodiphenylamine/Diphenylam	A	100	99	0.9340443	0.9317645		-0.2	20
4-Bromophenyl-phenylether	A	50.0	50	0.2478567	0.2462324		-0.7	20
Hexachlorobenzene	A	50.0	52	0.2677796	0.279425		4.3	20
Pentachlorophenol	A	50.0	53	0.1386658	0.1506073		8.6	20
Carbazole	A	50.0	50	0.9210803	0.9237331		0.3	20
Di-n-butylphthalate	A	50.0	45	1.318872	1.213567		-8.0	20
Butylbenzylphthalate	A	50.0	51	0.3370092	0.3469804		3.0	20
3,3'-Dichlorobenzidine	A	50.0	51	0.3430223	0.3517633		2.5	20
Bis(2-ethylhexyl)phthalate	A	50.0	52	0.7507349	0.7907036		5.3	20
Di-n-octylphthalate	Q	50.0	49	1.026902	1.192878		-2.5	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

YES NO N/A

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect(s) in the data assessments.

15.0 Internal Standards (Form VIII)

15.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits (-50% to + 100%) for each continuing calibration? ✓ ___ ___

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area	LowerLimit	Upper Limit

(Attach additional sheets if necessary.)

Note: Check Table 5, 8270D-41 for associated analytes.

ACTION: i. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results and non-detects (U values) quantitated with this internal standard.

ii. Non-detects associated with IS > 100% should not be qualified.

	YES	NO	N/A
iii. If the IS area is below the lower limit (<50%), qualify all associated non-detects (U-values) "J". If extremely low area counts are reported (<25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable (R).			
15.2 Are the retention times of all internal standards within 30 seconds of the associated calibration standard?	[✓]	___	___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

16.0 Laboratory Control Samples (LCS)

	YES	NO	N/A
16.1 Were any LCS samples run in order to verify analytes which failed criteria for spike recovery?	[ ]	[✓]	___
16.2 Did the lab spike LCS sample spiked with the same analytes and the same concentrations as the matrix spike?	[✓]	___	___
16.3 Were the mean and standard deviation of all analytes within the QC acceptance ranges as shown in Table 6, 8270D-43?	[ ]	[✓]	___

ACTION: If the recovery of any analyte falls out of the designated range, the analytical results for that compound is suspect and should be qualified "J" in the unspiked samples.

See attached form — no qual

17.0 Field Duplicates

	YES	NO	N/A
17.1 Were any field duplicates submitted for semivolatile analysis?	[✓]	___	___

PREPARATION BATCH SUMMARY

EPA 8270D

Laboratory: ENCO Orlando SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Batch: 3E22001 Batch Matrix: Water Preparation: EPA 3510C_MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	3E22001-BLK1	1f5005.D	05/22/13 01:30	
LCS	3E22001-BS1	1f5006.D	05/22/13 01:30	
LCS Dup	3E22001-BSD1	1f5007.D	05/22/13 01:30	
Veno-EB01-051513-SD	A302428-14	1f5008.D	05/22/13 01:30	

high rec - no ⊕ for compd in assoc sample, no qual

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Water		
Batch:	3E22001	Laboratory ID:	3E22001-BS1
Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Benzaldehyde	50.0	44	87	43 - 87
Phenol	50.0	18	37	0 - 115
Bis(2-chloroethyl)ether	50.0	46	91	35 - 110
2-Chlorophenol	50.0	39	79	35 - 105
2-Methylphenol	50.0	34	68	40 - 110
Bis(2-chloroisopropyl)ether	50.0	41	82	25 - 130
Acetophenone	50.0	42	83	41 - 92
3 & 4-Methylphenol	50.0	31	63	30 - 110
N-Nitroso-di-n-propylamine	50.0	52	103	35 - 130
Hexachloroethane	50.0	24	49	30 - 100
Nitrobenzene	50.0	42	84	45 - 110
Isophorone	50.0	46	92	50 - 110
2-Nitrophenol	50.0	41	82	40 - 115
2,4-Dimethylphenol	50.0	37	73	30 - 110
Bis(2-chloroethoxy)methane	50.0	36	73	45 - 105
2,4-Dichlorophenol	50.0	39	77	50 - 105
4-Chloroaniline	50.0	34	69	15 - 110
Hexachlorobutadiene	50.0	23	47	25 - 105
Caprolactam	50.0	15	30	10 - 51
4-Chloro-3-methylphenol	50.0	43	87	45 - 110
Hexachlorocyclopentadiene	50.0	22	43	10 - 117
1,2,4,5-Tetrachlorobenzene	50.0	26	53	24 - 69
2,4,6-Trichlorophenol	50.0	40	79	50 - 115
2,4,5-Trichlorophenol	50.0	40	81	50 - 110
1,1'-Biphenyl	50.0	35	70	46 - 83
2-Nitroaniline	50.0	50	100	50 - 115
Dimethylphthalate	50.0	37	75	25 - 125
2,6-Dinitrotoluene	50.0	44	88	50 - 115
3-Nitroaniline	50.0	46	91	20 - 125
2,4-Dinitrophenol	50.0	50	101	15 - 140

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Water		
Batch:	3E22001	Laboratory ID:	3E22001-BS1
Preparation:	EPA 3510C MS	Initial/Final:	500 mL / 0.5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
4-Nitrophenol	50.0	31	62	0 - 125
Dibenzofuran	50.0	39	77	55 - 105
2,4-Dinitrotoluene	50.0	57	113	50 - 120
2,3,4,6-Tetrachlorophenol	50.0	48	95 *	61 - 94
Diethylphthalate	50.0	47	95	40 - 120
4-Chlorophenyl-phenylether	50.0	43	86	50 - 110
4-Nitroaniline	50.0	58	116	35 - 120
2-Methyl-4,6-dinitrophenol	50.0	52	104	40 - 130
N-nitrosodiphenylamine/Diphenylamine	50.0	46	92	50 - 110
4-Bromophenyl-phenylether	50.0	39	78	50 - 115
Hexachlorobenzene	50.0	45	89	50 - 110
Atrazine	50.0	58	115 *	47 - 101
Pentachlorophenol	50.0	50	99	40 - 115
Carbazole	50.0	52	103	50 - 115
Di-n-butylphthalate	50.0	51	103	55 - 115
Butylbenzylphthalate	50.0	56	112	45 - 115
3,3'-Dichlorobenzidine	50.0	43	86	20 - 110
Bis(2-ethylhexyl)phthalate	50.0	58	116	40 - 125
Di-n-octylphthalate	50.0	51	102	35 - 135

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzaldehyde	50.0	39	78	11	30	43 - 87
Phenol	50.0	16	33	11	30	0 - 115
Bis(2-chloroethyl)ether	50.0	41	81	11	30	35 - 110
2-Chlorophenol	50.0	36	71	10	30	35 - 105
2-Methylphenol	50.0	31	61	11	30	40 - 110
Bis(2-chloroisopropyl)ether	50.0	36	72	12	30	25 - 130
Acetophenone	50.0	37	74	11	30	41 - 92
3 & 4-Methylphenol	50.0	27	55	14	30	30 - 110

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Water		
Batch:	3E22001	Laboratory ID:	3E22001-BSD1
Preparation:	EPA 3510C MS	Initial/Final:	500 mL / 0.5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
N-Nitroso-di-n-propylamine	50.0	45	90	14	30	35 - 130
Hexachloroethane	50.0	22	45	9	30	30 - 100
Nitrobenzene	50.0	38	76	11	30	45 - 110
Isophorone	50.0	41	82	12	30	50 - 110
2-Nitrophenol	50.0	39	77	6	30	40 - 115
2,4-Dimethylphenol	50.0	33	65	11	30	30 - 110
Bis(2-chloroethoxy)methane	50.0	33	65	11	30	45 - 105
2,4-Dichlorophenol	50.0	35	70	10	30	50 - 105
4-Chloroaniline	50.0	31	62	10	30	15 - 110
Hexachlorobutadiene	50.0	21	43	10	30	25 - 105
Caprolactam	50.0	13	27	12	30	10 - 51
4-Chloro-3-methylphenol	50.0	39	78	11	30	45 - 110
Hexachlorocyclopentadiene	50.0	20	40	7	30	10 - 117
1,2,4,5-Tetrachlorobenzene	50.0	24	48	9	30	24 - 69
2,4,6-Trichlorophenol	50.0	36	72	9	30	50 - 115
2,4,5-Trichlorophenol	50.0	37	73	9	30	50 - 110
1,1'-Biphenyl	50.0	32	63	10	30	46 - 83
2-Nitroaniline	50.0	46	91	9	30	50 - 115
Dimethylphthalate	50.0	34	68	10	30	25 - 125
2,6-Dinitrotoluene	50.0	39	79	11	30	50 - 115
3-Nitroaniline	50.0	42	83	9	30	20 - 125
2,4-Dinitrophenol	50.0	48	97	4	30	15 - 140
4-Nitrophenol	50.0	29	58	7	30	0 - 125
Dibenzofuran	50.0	35	70	10	30	55 - 105
2,4-Dinitrotoluene	50.0	52	103	9	30	50 - 120
2,3,4,6-Tetrachlorophenol	50.0	43	86	10	30	61 - 94
Diethylphthalate	50.0	43	87	9	30	40 - 120
4-Chlorophenyl-phenylether	50.0	38	77	11	30	50 - 110
4-Nitroaniline	50.0	54	107	8	30	35 - 120
2-Methyl-4,6-dinitrophenol	50.0	49	99	5	30	40 - 130

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Water		
Batch:	3E22001	Laboratory ID:	3E22001-BSD1
Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
N-nitrosodiphenylamine/Diphenylam	50.0	42	84	9	30	50 - 110
4-Bromophenyl-phenylether	50.0	34	68	13	30	50 - 115
Hexachlorobenzene	50.0	39	78	14	30	50 - 110
Atrazine	50.0	52	104 *	11	30	47 - 101
Pentachlorophenol	50.0	45	91	9	30	40 - 115
Carbazole	50.0	46	92	11	30	50 - 115
Di-n-butylphthalate	50.0	45	90	13	30	55 - 115
Butylbenzylphthalate	50.0	49	99	13	30	45 - 115
3,3'-Dichlorobenzidine	50.0	38	77	12	30	20 - 110
Bis(2-ethylhexyl)phthalate	50.0	52	104	10	30	40 - 125
Di-n-octylphthalate	50.0	46	93	10	30	35 - 135

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

EPA 8270D

Laboratory: ENCO Orlando SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Batch: 3E22007 Batch Matrix: Soil Preparation: EPA 3550C_MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	3E22007-BLK1	1f3005.D	05/22/13 09:00	
LCS	3E22007-BS1	1f3006.D	05/22/13 09:00	
Veno-SD02-000H	3E22007-MS1	1f3007.D	05/22/13 09:00	
Veno-SD02-000H	3E22007-MSD1	1f3008.D	05/22/13 09:00	
Veno-SD01-000H	A302428-07	1f3010.D	05/22/13 09:00	
Veno-SD01P-000H	A302428-08	1f3011.D	05/22/13 09:00	
Veno-SD01-0H01	A302428-09	1f3012.D	05/22/13 09:00	
Veno-SD02-000H	A302428-10	1f3009.D	05/22/13 09:00	
Veno-SD03-000H	A302428-11	1f3013.D	05/22/13 09:00	
Veno-SD12-000H	A302428-12	1f3014.D	05/22/13 09:00	
Veno-SD02-0H01	A302428-13	1f3015.D	05/22/13 09:00	

high rec — MO ⊕ for this compd in assoc samples. MO qual

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E22007	Laboratory ID:	3E22007-BS1
Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	LCS % REC. #	QC LIMITS REC.
Benzaldehyde	1.67	1.2	73	45 - 99
Phenol	1.67	1.2	70	40 - 100
Bis(2-chloroethyl)ether	1.67	1.3	76	40 - 105
2-Chlorophenol	1.67	1.1	68	45 - 105
2-Methylphenol	1.67	1.1	65	40 - 105
Bis(2-chloroisopropyl)ether	1.67	1.2	73	20 - 115
Acetophenone	1.67	1.2	71	52 - 86
3 & 4-Methylphenol	1.67	1.2	72	40 - 105
N-Nitroso-di-n-propylamine	1.67	1.5	90	40 - 115
Hexachloroethane	1.67	1.2	70	35 - 110
Nitrobenzene	1.67	1.3	78	40 - 115
Isophorone	1.67	1.5	92	45 - 110
2-Nitrophenol	1.67	1.2	74	40 - 110
2,4-Dimethylphenol	1.67	1.1	65	30 - 105
Bis(2-chloroethoxy)methane	1.67	1.2	69	45 - 110
2,4-Dichlorophenol	1.67	1.2	75	45 - 110
4-Chloroaniline	1.67	0.94	57	10 - 100
Hexachlorobutadiene	1.67	1.2	74	40 - 115
Caprolactam	1.67	1.9	113	14 - 125
4-Chloro-3-methylphenol	1.67	1.5	92	45 - 115
Hexachlorocyclopentadiene	1.67	1.3	80	10 - 170
1,2,4,5-Tetrachlorobenzene	1.67	1.4	81	59 - 81
2,4,6-Trichlorophenol	1.67	1.4	84	45 - 110
2,4,5-Trichlorophenol	1.67	1.4	86	50 - 110
1,1'-Biphenyl	1.67	1.5	88	52 - 100
2-Nitroaniline	1.67	1.7	103	45 - 120
Dimethylphthalate	1.67	1.6	99	50 - 110
2,6-Dinitrotoluene	1.67	1.6	94	50 - 110
3-Nitroaniline	1.67	1.4	86	25 - 110
2,4-Dinitrophenol	1.67	0.99	59	15 - 130

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E22007	Laboratory ID:	3E22007-BS1
Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	LCS % REC. #	QC LIMITS REC.
4-Nitrophenol	1.67	1.9	114	15 - 140
Dibenzofuran	1.67	1.5	91	50 - 105
2,4-Dinitrotoluene	1.67	1.9	113	50 - 115
2,3,4,6-Tetrachlorophenol	1.67	1.6	97	18 - 98
Diethylphthalate	1.67	1.8	106	50 - 115
4-Chlorophenyl-phenylether	1.67	1.6	95	45 - 110
4-Nitroaniline	1.67	1.5	92	35 - 115
2-Methyl-4,6-dinitrophenol	1.67	1.5	90	30 - 135
N-nitrosodiphenylamine/Diphenylamine	1.67	1.6	96	50 - 115
4-Bromophenyl-phenylether	1.67	1.5	90	45 - 115
Hexachlorobenzene	1.67	1.7	100	45 - 120
Atrazine	1.67	1.8	106	45 - 120
Pentachlorophenol	1.67	1.5	91	25 - 120
Carbazole	1.67	1.8	106	45 - 115
Di-n-butylphthalate	1.67	1.7	103	55 - 110
Butylbenzylphthalate	1.67	2.3	136 *	50 - 125
3,3'-Dichlorobenzidine	1.67	1.3	76	10 - 130
Bis(2-ethylhexyl)phthalate	1.67	1.9	115	45 - 125
Di-n-octylphthalate	1.67	1.9	112	40 - 130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

YES NO N/A

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

VEN0-SD01-000H
VEN0-SD01P-000H
No ⊕
No qual

Sample VEN0-SD01-000H was RE due to a low surr rec. The RE was excluded in favor of the initial analy as similar results were exhibited and the RE was extracted out of HT

Initial Calibration Date: 4/24/2013

RRF and %RSD Calculations:

Compound Name: phenol
Lab Value: 1.792

Area of Compound	312861
Area of Internal STD	349085
Conc. of Internal STD	40
Conc. of Compound	20
Calculated RRF	1.792

Compound Name: nitrobenzene
Lab Value: 8.77

RRF of STD 1	0.412
RRF of STD 2	0.3979607
RRF of STD 3	0.3934665
RRF of STD 4	0.3727513
RRF of STD 5	0.3725207
RRF of STD 6	0.3590465
RRF of STD 7	0.34256
RRF of STD 8	0.3116514
Calculated % RSD	8.77

Continuing Calibration File ID: 6/5/2013

RRF and %D Calculations:

Compound Name: 2-chlorophenol
Lab Value: 1.553

Area of Compound	900667
Area of Internal STD	463980
Conc. of Internal STD	40
Conc. of Compound	50
Calculated RRF	1.553

Compound Name: butylbenzylphthalate
Lab Value: 3.0

Average RRF	0.3370092
Calibration Check RRF	0.3469804
Calculated % D	-3.0

LOD Verification

Laboratory: ENCO

Sample ID: VENO-SD01-000H
Compound: phenol
Reported LOD: 0.18 ug/Kg

Compound	Blank LOD	Sample LOD	% Moisture	Sample Size	Calculated LOD
acetone	0.1	0.18	45.07	30.30	0.18

Jacqueline Cleveland

From: Marcia Colon <mcolon@encolabs.com>
Sent: Wednesday, July 10, 2013 6:11 AM
To: 'DataQual'
Cc: Juliana.Dean@ch2m.com; 'Michael Zamboni'; 'Jacqueline Cleveland'
Subject: RE: CTO-037 La Chiva SVOA fraction

Hi Laura-

The samples VENO-SD04-0H01 (A302870-06), VENO-SD05-000H (A302870-07), VENO-SD06-000H (A302870-08), VENO-SD02-000H (A302428-10), VENO-SD01P-000H (A302428-08), VENO-SD01-0H01 (A302428-09), VENO-SD12-000H (A302428-12) and VENO-SD02-0H01 (A302428-13) were not re-extracted due to their matrix interference issues. The client was informed of the low surrogate issues for a number of samples from this site in multiple methods. There were many comments and observations about matrix interferences with these particular samples. The laboratory decided to re-extract a sample from each different SDG to confirm the original results and matrix interference effects.

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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ENCO is an eco-friendly lab offering paperless service options, please contact me anytime with questions.

From: DataQual [mailto:dataqual@charter.net]
Sent: Monday, July 08, 2013 3:21 PM
To: Marcia Colon
Cc: Juliana.Dean@ch2m.com; Michael Zamboni; Jacqueline Cleveland
Subject: CTO-037 La Chiva SVOA fraction

Hi Marcia,

The following questions are for project CTO-037 East Vieques La Chiva concerning the **SVOA fraction** data packages.

SDG# A302870

- Samples VENO-SD04-0H01 (A302870-06), VENO-SD05-000H (A302870-07) and VENO-SD06-000H (A302870-08) exhibited a low surrogate recoveries for all surrogates. Surrogate results exhibited for all these samples include zero and less than 10% recoveries. I am not finding that the samples were re-analyzed. Please check if the samples were re-analyzed and if so please provide the sample analysis and all associated forms for all samples listed.

SDG# A302428

- Samples VENO-SD02-000H (A302428-10), VENO-SD01P-000H (A302428-08), VENO-SD01-0H01 (A302428-09), VENO-SD12-000H (A302428-12) and VENO-SD02-0H01 (A302428-13) exhibited two or more low surrogate recoveries. I am not finding that the samples were re-analyzed. Please check if the samples were re-analyzed and if so please provide the sample analysis and all associated forms for all samples listed.

If there are any questions concerning these issues please feel free to contact me.

Thank you,
Laura

Laura Maschhoff
DataQual Environmental Services, LLC
dataqual@charter.net
314-330-1327

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: _____ SDG# A302428
LAB: ENCO Labs SITE: E. Vieques La Chivas

1.0 Data Completeness and Deliverables	YES	NO	N/A
1.1 Has all the data been submitted in CLP deliverable format?	[✓]	___	___
1.2 Have any missing deliverables been received and added to the data package?	[✓]	___	___

See report for specifics - a copy of email correspondence is in worksheet 1.

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter, SDG Narrative			
2.1 Is a laboratory narrative or cover letter present?	[✓]	___	___
2.2 Are the case number and/or SDG number contained in the narrative or cover letter?	[✓]	___	___

3.0 Data Validation Checklist			
3.1 Does this data package contain:			
Water data?	[✓]	___	___
Waste data?	[ ]	___	✓
Soil/solid data?	[✓]	___	___

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 302428

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	**% Moisture**
VENO-SD02-000H	53.08
VENO-SD03-000H	53.85
VENO-SD12-000H	60.87

ORGANOCHLORINE PESTICIDE

YES NO N/A

1.0 Traffic Reports and Laboratory Narrative

1.1 Are traffic report and chain-of-custody forms present for all samples? [✓] ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? ✓ [ ] ___

See report for flags

ACTION: If any sample analyzed as a soil, other than than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, all non detects are qualified as unusable, "R", and positive results flagged "J".

ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".

2.0 Holding Times

2.1 Have any organochlorine pesticide technical holding times, determined from date of collection to date of extraction, been exceeded? ✓ [ ] ___

REJ out by 5 days - Exclude

Water and waste samples for organochlorine pesticide analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

HOLDING TIME SUMMARY

EPA 8081B

Laboratory: ENCO Orlando

SDG: A302428-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
Veno-SS01-0002	05/14/13 09:30	05/16/13 09:25	05/21/13 03:30	7.00	14.00	06/04/13 14:46	14.00	40.00	
Veno-SS01P-0002	05/14/13 09:30	05/16/13 09:25	05/21/13 03:30	7.00	14.00	06/04/13 14:58	14.00	40.00	
Veno-SS04-0001	05/14/13 11:00	05/16/13 09:25	05/21/13 03:30	7.00	14.00	06/04/13 15:10	14.00	40.00	
Veno-SS05-0002	05/14/13 10:30	05/16/13 09:25	05/21/13 03:30	7.00	14.00	06/04/13 15:22	14.00	40.00	
Veno-SS07-0002	05/14/13 13:30	05/16/13 09:25	05/21/13 03:30	7.00	14.00	06/04/13 15:34	14.00	40.00	
Veno-EB01-051413-SS	05/14/13 08:35	05/16/13 09:25	05/20/13 13:30	6.00	7.00	06/04/13 13:45	15.00	40.00	
Veno-SD01-000H	05/15/13 10:30	05/16/13 09:25	05/21/13 03:30	6.00	14.00	06/04/13 15:46	14.00	40.00	
Veno-SD01P-000H	05/15/13 10:30	05/16/13 09:25	05/21/13 03:30	6.00	14.00	06/04/13 15:58	14.00	40.00	
Veno-SD01-0H01	05/15/13 10:45	05/16/13 09:25	05/21/13 03:30	6.00	14.00	06/04/13 16:11	14.00	40.00	
Veno-SD02-000H	05/15/13 09:15	05/16/13 09:25	05/21/13 03:30	6.00	14.00	06/04/13 12:57	14.00	40.00	
Veno-SD02-000H	05/15/13 09:15	05/16/13 09:25	06/03/13 00:44	19.00	14.00	06/07/13 14:11	4.00	40.00	* exclude
Veno-SD03-000H	05/15/13 08:15	05/16/13 09:25	05/21/13 03:30	6.00	14.00	06/04/13 16:23	14.00	40.00	
Veno-SD12-000H	05/15/13 08:30	05/16/13 09:25	05/21/13 03:30	6.00	14.00	06/04/13 16:35	14.00	40.00	
Veno-SD02-0H01	05/15/13 10:00	05/16/13 09:25	05/21/13 03:30	6.00	14.00	06/04/13 16:47	14.00	40.00	
Veno-EB01-051513-SD	05/15/13 07:00	05/16/13 09:25	05/20/13 13:30	5.00	7.00	06/04/13 13:57	15.00	40.00	

ACTION: Qualify sample results according to Table 1.

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 7 days (extraction) > 40 days (analysis)	J*	UJ
	Yes	≤ 7 days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days (extraction) >40 days (analysis)	J	UJ
	Yes	≤ 14days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 14days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

YES NO N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste [✓] ___ ___

b. Soil/Solid [✓] ___ ___

3.2 Are all the pesticide samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water [✓] ___ ___

b. Waste [ ] ___ [✓]

c. Soil/Solid [✓] ___ ___

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between ~~30-150%~~ for all samples, including MS and MSDs, LCSs and all blanks? [ ] [✓] ___

Note: Reviewer shall use lab in-house recover limits if available. In-house criteria should be examined for reasonableness. See Form IIs for flags

ACTION: Circle all outliers in red. Follow surrogate action Table 2.

3.5 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? [✓] ___ ___

ACTION: Follow surrogate action, Table 2 below. RT's stable

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24376	Instrument:	OSVGCECD2
Matrix:	Soil	Calibration:	1304047

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q	
LCS Dup (3E20028-BSD1)			Lab File ID: 2F4008.D		Analyzed: 06/04/13 11:33				
2,4,5,6-TCMX	1.00	106	25 - 140	2.156	2.003333	0.1527	+/-1.0		
2,4,5,6-TCMX	1.00	106	25 - 140	2.156	2.003333	0.1527	+/-1.0		
2,4,5,6-TCMX [2C]	1.00	92	25 - 140	2.037	1.894667	0.1423	+/-1.0		
2,4,5,6-TCMX [2C]	1.00	92	25 - 140	2.037	1.894667	0.1423	+/-1.0		
Decachlorobiphenyl	1.00	85	30 - 135	6.19	6.021	0.1690	+/-1.0		
Decachlorobiphenyl	1.00	85	30 - 135	6.19	6.021	0.1690	+/-1.0		
Decachlorobiphenyl [2C]	1.00	76	30 - 135	6.253	6.089167	0.1638	+/-1.0		
Decachlorobiphenyl [2C]	1.00	76	30 - 135	6.253	6.089167	0.1638	+/-1.0		
Blank (3E21001-BLK1)			Lab File ID: 2F4009.D		Analyzed: 06/04/13 11:45				
2,4,5,6-TCMX	0.0333	126	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	NQ
2,4,5,6-TCMX	0.0333	126	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0333	117	70 - 125	2.033	1.894667	0.1383	+/-1.0		
2,4,5,6-TCMX [2C]	0.0333	117	70 - 125	2.033	1.894667	0.1383	+/-1.0		
Decachlorobiphenyl	0.0333	142	55 - 130	6.188	6.021	0.1670	+/-1.0	*	NQ
Decachlorobiphenyl	0.0333	142	55 - 130	6.188	6.021	0.1670	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0333	127	55 - 130	6.252	6.089167	0.1628	+/-1.0		
Decachlorobiphenyl [2C]	0.0333	127	55 - 130	6.252	6.089167	0.1628	+/-1.0		
LCS (3E21001-BS1)			Lab File ID: 2F4010.D		Analyzed: 06/04/13 11:57				
2,4,5,6-TCMX	0.0333	104	70 - 125	2.155	2.003333	0.1517	+/-1.0		
2,4,5,6-TCMX	0.0333	104	70 - 125	2.155	2.003333	0.1517	+/-1.0		
2,4,5,6-TCMX [2C]	0.0333	91	70 - 125	2.038	1.894667	0.1433	+/-1.0		
2,4,5,6-TCMX [2C]	0.0333	91	70 - 125	2.038	1.894667	0.1433	+/-1.0		
Decachlorobiphenyl	0.0333	86	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl	0.0333	86	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0333	77	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Decachlorobiphenyl [2C]	0.0333	77	55 - 130	6.253	6.089167	0.1638	+/-1.0		

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24376	Instrument:	OSVGCECD2
Matrix:	Water	Calibration:	1304047

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q	
Veno-SS01-0002 (A302428-01)			Lab File ID: 2F4024.D		Analyzed: 06/04/13 14:46				
2,4,5,6-TCMX	0.0434	82	70 - 125	2.151	2.003333	0.1477	+/-1.0		
2,4,5,6-TCMX [2C]	0.0434	72	70 - 125	2.033	1.894667	0.1383	+/-1.0		
Decachlorobiphenyl	0.0434	73	55 - 130	6.19	6.021	0.1690	+/-1.0		
Decachlorobiphenyl [2C]	0.0434	63	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Veno-SS01P-0002 (A302428-02)			Lab File ID: 2F4025.D		Analyzed: 06/04/13 14:58				
2,4,5,6-TCMX	0.0433	68	70 - 125	2.149	2.003333	0.1457	+/-1.0	*	JWJ
2,4,5,6-TCMX [2C]	0.0433	62	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	↓
Decachlorobiphenyl	0.0433	69	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0433	57	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Veno-SS04-0001 (A302428-03)			Lab File ID: 2F4026.D		Analyzed: 06/04/13 15:10				
2,4,5,6-TCMX	0.0495	64	70 - 125	2.149	2.003333	0.1457	+/-1.0	*	JWJ
2,4,5,6-TCMX [2C]	0.0495	59	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	↓
Decachlorobiphenyl	0.0495	79	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0495	66	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Veno-SS05-0002 (A302428-04)			Lab File ID: 2F4027.D		Analyzed: 06/04/13 15:22				
2,4,5,6-TCMX	0.0356	DL	70 - 125	2.154	2.003333	0.1507	+/-1.0	*	~~JWJ~~ NQ
2,4,5,6-TCMX [2C]	0.0356	↓	70 - 125	2.036	1.894667	0.1413	+/-1.0	*	↓
Decachlorobiphenyl	0.0356		55 - 130	6.189	6.021	0.1680	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0356		55 - 130	6.253	6.089167	0.1638	+/-1.0	*	
Veno-SS07-0002 (A302428-05)			Lab File ID: 2F4028.D		Analyzed: 06/04/13 15:34				XICCCR JRC 7/6/13 Surrogate diluted out
2,4,5,6-TCMX	0.0354	78	70 - 125	2.153	2.003333	0.1497	+/-1.0		
2,4,5,6-TCMX [2C]	0.0354	73	70 - 125	2.035	1.894667	0.1403	+/-1.0		
Decachlorobiphenyl	0.0354	75	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0354	71	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Veno-SD01-000H (A302428-07)			Lab File ID: 2F4029.D		Analyzed: 06/04/13 15:46				
2,4,5,6-TCMX	0.0599	66	70 - 125	2.152	2.003333	0.1487	+/-1.0	*	NQ
2,4,5,6-TCMX [2C]	0.0599	75	70 - 125	2.035	1.894667	0.1403	+/-1.0		
Decachlorobiphenyl	0.0599	72	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0599	60	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Veno-SD01P-000H (A302428-08)			Lab File ID: 2F4030.D		Analyzed: 06/04/13 15:58				
2,4,5,6-TCMX	0.0603	66	70 - 125	2.153	2.003333	0.1497	+/-1.0	*	JWJ
2,4,5,6-TCMX [2C]	0.0603	62	70 - 125	2.035	1.894667	0.1403	+/-1.0	*	↓
Decachlorobiphenyl	0.0603	71	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0603	60	55 - 130	6.253	6.089167	0.1638	+/-1.0		

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24376	Instrument:	OSVGCECD2
Matrix:	Soil	Calibration:	1304047

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q	
Matrix Spike (3E21001-MS1)			Lab File ID: 2F4013.D		Analyzed: 06/04/13 12:33				
2,4,5,6-TCMX	0.0708	62	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	NQ
2,4,5,6-TCMX	0.0708	62	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0708	59	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0708	59	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
Decachlorobiphenyl	0.0708	71	55 - 130	6.188	6.021	0.1670	+/-1.0		
Decachlorobiphenyl	0.0708	71	55 - 130	6.188	6.021	0.1670	+/-1.0		
Decachlorobiphenyl [2C]	0.0708	59	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Decachlorobiphenyl [2C]	0.0708	59	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Matrix Spike Dup (3E21001-MSD1)			Lab File ID: 2F4014.D		Analyzed: 06/04/13 12:45				
2,4,5,6-TCMX	0.0710	51	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	NQ
2,4,5,6-TCMX	0.0710	51	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0710	49	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0710	49	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
Decachlorobiphenyl	0.0710	64	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl	0.0710	64	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0710	53	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	NQ
Decachlorobiphenyl [2C]	0.0710	53	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	
Veno-SD02-000H (A302428-10)			Lab File ID: 2F4015.D		Analyzed: 06/04/13 12:57				XLSOFTC SFC 7/23
2,4,5,6-TCMX	0.0706	66	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	NQ JWJ
2,4,5,6-TCMX [2C]	0.0706	61	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
Decachlorobiphenyl	0.0706	73	55 - 130	6.188	6.021	0.1670	+/-1.0		
Decachlorobiphenyl [2C]	0.0706	64	55 - 130	6.252	6.089167	0.1628	+/-1.0		
Veno-EB01-051413-SS (A302428-06)			Lab File ID: 2F4019.D		Analyzed: 06/04/13 13:45				
2,4,5,6-TCMX	1.00	72	25 - 140	2.151	2.003333	0.1477	+/-1.0		
2,4,5,6-TCMX [2C]	1.00	65	25 - 140	2.034	1.894667	0.1393	+/-1.0		
Decachlorobiphenyl	1.00	62	30 - 135	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	1.00	54	30 - 135	6.253	6.089167	0.1638	+/-1.0		
Veno-EB01-051513-SD (A302428-14)			Lab File ID: 2F4020.D		Analyzed: 06/04/13 13:57				
2,4,5,6-TCMX	1.00	71	25 - 140	2.15	2.003333	0.1467	+/-1.0		
2,4,5,6-TCMX [2C]	1.00	65	25 - 140	2.033	1.894667	0.1383	+/-1.0		
Decachlorobiphenyl	1.00	81	30 - 135	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	1.00	71	30 - 135	6.253	6.089167	0.1638	+/-1.0		

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24376	Instrument:	OSVGCECD2
Matrix:	Water	Calibration:	1304047

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q	
Veno-SD01-0H01 (A302428-09)			Lab File ID: 2F4031.D		Analyzed: 06/04/13 16:11				
2,4,5,6-TCMX	0.0547	60	70 - 125	2.153	2.003333	0.1497	+/-1.0	*	J/UJ
2,4,5,6-TCMX [2C]	0.0547	54	70 - 125	2.036	1.894667	0.1413	+/-1.0	*	
Decachlorobiphenyl	0.0547	66	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0547	56	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Veno-SD03-000H (A302428-11)			Lab File ID: 2F4032.D		Analyzed: 06/04/13 16:23				
2,4,5,6-TCMX	0.0710	53	70 - 125	2.152	2.003333	0.1487	+/-1.0	*	J/UJ
2,4,5,6-TCMX [2C]	0.0710	49	70 - 125	2.035	1.894667	0.1403	+/-1.0	*	
Decachlorobiphenyl	0.0710	65	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0710	59	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Veno-SD12-000H (A302428-12)			Lab File ID: 2F4033.D		Analyzed: 06/04/13 16:35				
2,4,5,6-TCMX	0.0841	51	70 - 125	2.153	2.003333	0.1497	+/-1.0	*	J/UJ
2,4,5,6-TCMX [2C]	0.0841	49	70 - 125	2.035	1.894667	0.1403	+/-1.0	*	
Decachlorobiphenyl	0.0841	65	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0841	53	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	
Veno-SD02-0H01 (A302428-13)			Lab File ID: 2F4034.D		Analyzed: 06/04/13 16:47				
2,4,5,6-TCMX	0.0607	53	70 - 125	2.153	2.003333	0.1497	+/-1.0	*	J/UJ
2,4,5,6-TCMX [2C]	0.0607	48	70 - 125	2.035	1.894667	0.1403	+/-1.0	*	
Decachlorobiphenyl	0.0607	68	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0607	57	55 - 130	6.253	6.089167	0.1638	+/-1.0		

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24452	Instrument:	OSVGCECD2
Matrix:	Soil	Calibration:	1304047

Surrogate Compound	Spike Level ug/mL	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q	
Calibration Check (AA24452-CCV1)			Lab File ID: 2FB003.D		Analyzed: 06/07/13 10:28				
2,4,5,6-TCMX	0.100	109	80 - 120	2.136	2.003333	0.1327	+/-1.0		
2,4,5,6-TCMX [2C]	0.100	111	80 - 120	2.011	1.894667	0.1163	+/-1.0		
Decachlorobiphenyl	0.100	106	80 - 120	6.165	6.021	0.1440	+/-1.0		
Decachlorobiphenyl [2C]	0.100	105	80 - 120	6.222	6.089167	0.1328	+/-1.0		
Blank (3F03003-BLK1)			Lab File ID: 2FB012.D		Analyzed: 06/07/13 12:23				
2,4,5,6-TCMX	0.0333	168	70 - 125	2.134	2.003333	0.1307	+/-1.0	*	NQ
2,4,5,6-TCMX [2C]	0.0333	164	70 - 125	2.012	1.894667	0.1173	+/-1.0	*	
Decachlorobiphenyl	0.0333	154	55 - 130	6.166	6.021	0.1450	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0333	148	55 - 130	6.224	6.089167	0.1348	+/-1.0	*	
LCS (3F03003-BS1)			Lab File ID: 2FB013.D		Analyzed: 06/07/13 12:35				
2,4,5,6-TCMX	0.0333	101	70 - 125	2.129	2.003333	0.1257	+/-1.0		
2,4,5,6-TCMX [2C]	0.0333	107	70 - 125	2.008	1.894667	0.1133	+/-1.0		
Decachlorobiphenyl	0.0333	112	55 - 130	6.165	6.021	0.1440	+/-1.0		
Decachlorobiphenyl [2C]	0.0333	108	55 - 130	6.224	6.089167	0.1348	+/-1.0		
Matrix Spike (3F03003-MS1)			Lab File ID: 2FB019.D		Analyzed: 06/07/13 13:47				
2,4,5,6-TCMX	0.0706	42	70 - 125	2.13	2.003333	0.1267	+/-1.0	*	NQ
2,4,5,6-TCMX [2C]	0.0706	45	70 - 125	2.01	1.894667	0.1153	+/-1.0	*	
Decachlorobiphenyl	0.0706	66	55 - 130	6.166	6.021	0.1450	+/-1.0		
Decachlorobiphenyl [2C]	0.0706	61	55 - 130	6.225	6.089167	0.1358	+/-1.0		
Matrix Spike Dup (3F03003-MSD1)			Lab File ID: 2FB020.D		Analyzed: 06/07/13 13:59				
2,4,5,6-TCMX	0.0708	44	70 - 125	2.13	2.003333	0.1267	+/-1.0	*	NQ
2,4,5,6-TCMX [2C]	0.0708	44	70 - 125	2.009	1.894667	0.1143	+/-1.0	*	
Decachlorobiphenyl	0.0708	60	55 - 130	6.166	6.021	0.1450	+/-1.0		
Decachlorobiphenyl [2C]	0.0708	54	55 - 130	6.224	6.089167	0.1348	+/-1.0	*	
Veno-SD02-000H (A302428-10RE1)			Lab File ID: 2FB021.D		Analyzed: 06/07/13 14:11				
2,4,5,6-TCMX	0.0703	41	70 - 125	2.13	2.003333	0.1267	+/-1.0	*	Exclude
2,4,5,6-TCMX [2C]	0.0703	41	70 - 125	2.01	1.894667	0.1153	+/-1.0	*	
Decachlorobiphenyl	0.0703	53	55 - 130	6.166	6.021	0.1450	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0703	47	55 - 130	6.224	6.089167	0.1348	+/-1.0	*	

YES NO N/A

Table 2. Surrogate Recovery Criteria

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement
150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample(LCS)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples. ✓ [ ] ___ ___

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

YES NO N/A

4.2 Were Laboratory Control Samples analyzed at the required concentration for all analytes of interest as specified ~~in Table 3 below.~~ lab SOP/client SOW [✓] ___ ___

Note: Use lab in-house criteria, if available.

Table 3. LCS Spiking Criteria

LCS Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml	Recovery Limits (%)
gamma-BHC	0.05	1	50-120
Heptachor epoxide	0.05	1	50-120
Dieldrin	0.01	1	30-130
4,4'-DDE	0.01	1	50-150
Endrin	0.01	1	50-120
Endosulfan sulfate	0.01	1	50-120
gamma-Chloradane	0.05	1	30-130
Tetrachloro-m-xylene(surrogate)	0.20	3	30-150
Decachlorobiphenyl (surrogate)	0.40	3	30-150

Note: The LCS might be spiked with the same analytes at the same concentration as the matrix spike.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed in table above? [✓] ___ ___

YES NO N/A

ACTION: For LCS % recovery not meeting the required recovery, follow the required action in Table 4 below.

Table 4. LCS Recovery Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Upper Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent)

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? [✓] ___ ___

NOTE: For soil and waste samples showing detectable amounts of organics, the lab may substitute replicate samples in place of the matrix spike (see page 8000B-40, section 8.5.3).

5.2 Have MS/MD or MS/MSD results been summarized on Form III/Equivalent? [✓] ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000B-39, section 8.5.])

	YES	NO	N/A
a. Water	[ ]		✓
b. Waste	[ ]		✓
c. Soil/Solid	[✓]		

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 We Were Matrix Spike Samples analyzed at the required concentration for all analytes of interest as specified in ~~Table 5 below~~. lab SOP/client SAP [✓]

Note: Spiking analytes may differ from those in Table 5. Check QA project plan or task order.

Table 5. Matrix Spiking Criteria

Matrix Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml
gamma-BHC	0.05	1
Heptachor	0.05	1
Aldrin	0.05	1
Dieldrin	1.0	1
Endrin	1.0	1
4,4'-DDT	1.0	1

Note: For aqueous organic extractable, the spike concentration should be:

1) For regulatory compliance monitoring - the regulatory concentration limit or 1 to 5 times the expected background concentration, whichever is higher;

2) For all other aqueous samples - the larger of either 1 to 5 x times the expected background

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8081B

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E21001	Laboratory ID:	3E21001-MS1
Preparation:	EPA 3550C	Initial/Final:	30.1 g / 10 mL

Source Sample Name: Veno-SD02-000H

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	MS CONCENTRATION (mg/kg dry)	MS % REC. #	QC LIMITS REC.	
4,4'-DDE	0.0708	0.017	0.066	69 *	70 - 125	J/UJ
4,4'-DDD	0.0708	0.0071	0.057	71	30 - 135	
4,4'-DDT	0.0708	0.0037	0.038	48	45 - 140	

COMPOUND	SPIKE ADDED (mg/kg dry)	MSD CONCENTRATION (mg/kg dry)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.	
4,4'-DDE	0.0710	0.066	68 *	0.009	30	70 - 125	J/UJ
4,4'-DDD	0.0710	0.065	82	13	30	30 - 135	
4,4'-DDT	0.0710	0.032	39 *	17	30	45 - 140	NQ

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Flag in native sample only

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8081B

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3F03003	Laboratory ID:	3F03003-MS1
Preparation:	EPA 3550C	Initial/Final:	30.2 g / 10 mL

Source Sample Name: Veno-SD02-000H

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	MS CONCENTRATION (mg/kg dry)	MS % REC. #	QC LIMITS REC.
4,4'-DDE	0.0706	0.012	0.058	65 *	70 - 125
4,4'-DDD	0.0706	0.0055	0.059	76	30 - 135
4,4'-DDT	0.0706	ND	0.037	52	45 - 140

JW

COMPOUND	SPIKE ADDED (mg/kg dry)	MSD CONCENTRATION (mg/kg dry)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
4,4'-DDE	0.0708	0.051	55 *	13	30	70 - 125
4,4'-DDD	0.0708	0.056	71	6	30	30 - 135
4,4'-DDT	0.0708	0.035	49	5	30	45 - 140

JW

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Flag in ~~native~~ sample only RE samples - not used

JC 7/2/13

YES NO N/A

concentration, or the same as the QC check sample concentration (see section 4 above);

3) For soil/solid and waste samples - the recommended concentration is 20 times the estimated quantitation limit (EQL).

No action is taken based on MS or replicate data alone. However, using informed professional judgement, the data reviewer may use the matrix spike or laboratory replicate results in conjunction with other QC criteria and determine the need for some qualification of the data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples.

5.5 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed in ~~Table 6 below.~~ lab SOP/client SAP [ ] ✓ ___

Note: Use lab in-house criteria, if available. see Form 3's for flags as necessary

Table 6. Matrix Spike Recovery Criteria

Compound	% Recovery Water	RPD Water	% Recovery Soil	RPD Soil
gamma-BHC	56-123	0-15	46-127	0-50
Heptachor	40-13	0-20	35-130	0-31
Aldrin	40-120	0-22	34-132	0-43
Dieldrin	52-126	0-18	31-134	0-38
Endrin	56-121	0-21	42-139	0-45
4,4'-DDT	38-127	0-27	23-134	0-50

NOTE: The actual number of MS analytes depends on the number analytes being measured (e.g., total number of MS plus MSD compounds). If only chlordane or toxaphene are the analytes of

YES NO N/A

interest, the spiked sample should contain the most representative multi-component analyte.

ACTION: Follow the matrix spike actions (Table 7) for pesticide analyses.

Table 7. Matrix Spike Qualifying Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% R ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R; RPD ≤ Upper Acceptance Limit	No qualifications	

Note: When the results of the matrix spike analyses indicates a potential problem due to the sample matrix itself, the LCS results are used to verify the laboratory can perform analyses in a clean matrix.

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on Method Blank Summary form(s) (Form IV)?

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? [✓] ___ ___

Note: Method blank should be analyzed, either after the calibration standard or at any other time during the analytical shift.

YES NO N/A

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for pesticides? [✓] ___ ___

ACTION: Use professional judgement to determine the effect on the data.

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for organochlorine pesticides? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ___ [✓] ___

7.2 Do any field/rinse blanks have positive organochlorine pesticide results? ___ [✓] ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in

YES NO N/A

another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 8 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 8. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying the calibration criteria.

Note: When applied as described in Table 8 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams", "junk peaks"), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference.

YES NO N/A

Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? [✓] ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic column used for the analysis of organochlorine pesticides? Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (See Method 8081B-8, section 4.2) [✓] ___ ___

8.2 If capillary columns were used, were they both wide bore (.53 mm ID) fused silica GC columns, such as DB-608 and DB-1701 or equivalent. Indicate the specific type of column used for:

column 1: Stx CLP Pesticides Diam 0.32mm

column 2: Stx CLP2 Diam 0.32mm

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. DDT/endrin breakdown check [✓] ___ ___

	YES	NO	N/A
b. toxaphene	[ ]		✓
c. technical chlordane	[ ]		✓
d. 5 pt. initial calibration standards	[✓]		
e. calibration verification standards	[✓]		
f. LCS	[✓]		
g. Method blanks	[✓]		

ACTION: If no, take action specified in 3.2 above.

9.2 Has a DDT/endrin breakdown check standard (at the mid-concentration level) been analyzed at the beginning of each analytical sequence on both columns (page 8081B-24, section 8.2.3)?	[✓]		

ACTION: If no, take action as specified in 3.2 above.

9.3 Has the individual % breakdown exceeded 20.0% on either column for:

- 4,4' - DDT?		[✓]	
- endrin?		[✓]	

ACTION: If any % breakdown has failed the QC criteria in the breakdown check standard, qualify all sample analyses in the entire analytical sequence as described below.

a. If 4,4'-DDT breakdown is greater than 20.%:

i. Qualify all positive results for DDT with 'J". If DDT was not detected, but DDD and DDE are positive, then qualify the quantitation limit for DDT as unusable ("R").

ii. Qualify positive results for DDD and DDE as presumptively present at an approximated quantity ("NJ").

YES NO N/A

b. If endrin breakdown is greater than 20.0%:

i. Qualify all positive results for endrin with "J". If endrin was not detected, but endrin aldehyde and endrin ketone are positive, then qualify the quantitation limit for endrin as unusable ("R").

ii. Qualify positive results for endrin ketone and endrin aldehyde as presumptively present at an approximated quantity ("NJ").

9.4 Are data summary forms (containing calibration factors or response factors) for the initial 5 pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? [✓] ___ ___

NOTE: If internal standard calibration procedure is used (page 8000B-16, section 7.4.2.2), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (page 8000B-16, section 7.4.2.1), then calibration factors must be used.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.5 Are there any transcription/calculation errors between raw data and data summary forms. ___ [✓] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.6 Are standard retention time (RT) windows for each analyte of interest presented on modified CLP summary forms? RTs stable [ ] [✓] ___

RT, exp RT & RT diff present on Form 10s

YES NO N/A

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all pesticides are established using retention times from three calibration standards analyzed during the entire analytical sequence (page 8081B-15, section 7.4.6).

A 72 hr. sequence is not required with this method, however, the method states that best results are obtained using retention times which span the entire sequence; i.e., using the mid level from the 5 pt. calibration, one of the mid-concentration standards analyzed during mid-sequence and one analyzed at the end.

9.7 Were RT windows on the confirmation column established using three standards as described above? [ ] ___ ✓

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.6 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples. dual columns system

ACTION: Note potential problems, if any, in the data assessment.

9.8 Do all standard retention times in each level of the initial 5 pt. calibrations for pesticides fall within the windows established during the initial calibration sequence? RTW's not provided by but RTs were stable [✓] ___ ___

ACTION: i. If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standards, spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows

YES NO N/A

may be too tight. If so, RT windows should be recalculated as per page 8081B-15, section 7.4.6.2

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

ACTION: For toxaphene and chlordane, the RT may be outside the RT window, but these analytes may still be identified from their individual patterns.

9.9 Has the linearity criteria for the initial calibration standards been satisfied for both columns? (% RSD must be < allowable limits* for all analytes). [✓] ___ ___

ACTION: If no, follow the actions in Table 9 below.

24 curves & RFs/%RSDs

Table 9. Initial Calibration Linearity Criteria

Criteria	Criteria	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD exceeds allowable limits*	J	No qualification
% RSD within allowable limits*	NO qualifications	

* %RSD ≤ 20% for single component compounds except alpha-BHC and delta-BHC.
%RSD ≤ 25% for alpha-BHC and delta-BHC
%RSD ≤ 30% for Toxaphene peaks
%RSD ≤ 30% for surrogates(tetrachloro-m-xylene and decachlorobiphenyl).

9.10 Has a calibration verification standard containing all analytes of interest been analyzed on each

YES NO N/A

working day, prior to sample analyses (pages 8081B-15, sections 7.5.2)? [✓] ___ ___

9.11 Has a calibration verification standard also been analyzed after every 10 samples and at the end of each analytical sequence (page 8081B-15, section 7.5.2)? [ ] ✓ ✓

ACTION: If no, take action as specified in section 3.2 above.

9.12 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence (closing CCV). Has no more than 72 hours elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene CCV? [✓] ___ ___

ACTION: See Table 10 below.

9.13 Has the percent difference (%D) exceeded ± 20% for any organochlorine pesticide analyte in any calibration verification standard? ✓ [ ] ___

See Form 7s for flags

9.14 Has a new 5 pt. calibration curve been generated for those analytes which failed in the calibration verification standard (page 8081B-16, section 7.5.2.2), and all samples which followed the out-of-control standard (page 8081B-16, section 7.5.2.3) reinjected? [ ] ✓ ✓

ACTION: If the %D for any analyte exceeded the ± 20% criterion and the instrument was not recalibrated for those analytes, see table below.

9.15 Have <u>daily</u> retention time windows been properly calculated for each analyte of interest (page 8081B-16, section 7.5.3)), using RTs from the associated mid concentration standard and standard deviation from the initial calibration)? RTWs not provided but RTs stable [✓] ✓ ___

CONTINUING CALIBRATION CHECK

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCECD2	Calibration:	1304047
Lab File ID:	2F4003.D	Calibration Date:	04/16/13 08:54
Sequence:	AA24376	Injection Date:	06/04/13
Lab Sample ID:	AA24376-CCV1	Injection Time:	10:28

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
4,4'-DDE	A	0.100	0.10	1.65308	1.859108		12.5	20
4,4'-DDD	A	0.100	0.097	1.000398	1.031309		3.1	20
4,4'-DDT	A	0.100	0.080	0.8654057	0.6892789		-20.4	20 * J/UJ

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

Flag DDT in all samples

CONTINUING CALIBRATION CHECK

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCECD2	Calibration:	1304047
Lab File ID:	2FB003.D	Calibration Date:	04/16/13 08:54
Sequence:	AA24452	Injection Date:	06/07/13
Lab Sample ID:	AA24452-CCV1	Injection Time:	10:28

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	*
4,4'-DDE	A	0.100	0.11	1.65308	2.030394		22.8	20 *	* NQ
4,4'-DDD	A	0.100	0.091	1.000398	0.9663401		-3.4	20	
4,4'-DDT	A	0.100	0.096	0.8654057	0.8329565		-3.7	20	

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

* assoc. samples not reported

YES NO N/A

ACTION: If no, take action specified in section 3.2 above or recalculate RT windows using the procedure outlined in method 8081B-16, section 7.5.3.

9.16 Do all standard retention times for each mid concentration standard fall within the windows established during the initial calibration sequence? [ ] ✓ ✓

9.17 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows (page 8081B-16, section 7.5.3)? RTs stable [✓] ___ ___

ACTION: If the answer to either 9.15 or 9.16 above is no, check the chromatograms of all samples which followed the last in-control standard. All samples analyzed after the last in-control standard must be re-injected, if initial analysis indicated the presence of the specific analyte that exceeded the retention time criteria (page 8081B-18, section 7.5.7.). If samples were not re-analyzed, document under Contract Non-compliance in the Data Assessment.

Reviewer has two options to determine how to qualify questionable sample data. First option is to determine if possible peaks are present within daily retention time window. If no possible peaks are found, non-detects are valid. If possible peaks are found (or interference), qualify positive hits as presumptively present "NJ" and non-detects are rejected "R". Second option is to use the ratio of the retention time of the analyte over the retention time of either surrogate. The passing criteria is ± 0.06 RRT units of the RRT of the standard component. Reject "R" all questionable analytes exceeding criteria, and "NJ" all other positive hits.

For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use option 2 specified in paragraph above.

YES NO N/A

See Table 10 below.

Table 10. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
RT out of RT window	Use professional judgement	
%D not within +/- 20%	J	UJ
Time elapsed greater than section 9.12 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.18 Are there any transcription/calculation errors between raw data and data summary forms? ___ [✓] ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? [✓] ___ ___

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? [✓] ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it

YES NO N/A

accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

11.0 Extraction Method Cleanup Efficiency Verification (Form IX/Equivalent)

11.1 Method 8081B permits a variety of extraction techniques to be used for sample preparation. Which extraction procedure was used?

1. Aqueous samples:

1. Separatory funnel (Method 3510) ✓

2. Continuous liquid-liquid extraction (Method 3520) _____

3. Solid phase extraction (Method 3535) _____

4. Other _____

2. Solid samples:

1. Soxhlet (Method 3540) _____

2. Automated Soxhlet (Method 3541) _____

3. Pressurized fluid (Method 3545) _____

4. Microwave extraction (Method 3546) _____

5. Ultrasonic extraction (Method 3550) ✓

6. Supercritical fluid (Method 3562) _____

7. Other _____

11.2 Is Form IX - Pest-1/Equivalent present and complete for each lot of Florisil/Cartridges used? (Florisil Cleanup, Method 3620A, is required for all organochlorine pesticide extracts.) [ ] ___ ✓

YES NO N/A

ACTION: If no, take action specified in 3.2 above. If data suggests that florisil cleanup was not performed, make note in the reviewer narrative.

NOTE: Method 3620A uses Florisil, while the SOW/CLP allows for Florisil cartridges. Method 3620A does not list which pesticides and surrogate(s) to use to verify column efficiency. The reviewer must check project plan to verify method used as well as the correct pesticide list. If not stated or available, use the CLP listing or accept what the laboratory used.

11.3 Are all samples listed on modified CLP Pesticide Florisil/Cartridge Check Form? [ ] ___ ✓

ACTION: If no, take action specified in 3.2 above.

11.4 If GPC Cleanup was performed, is Form IX - Pest-2/ Equivalent present? [ ] ___ ✓

ACTION: If GPC was not performed and sample results indicate significant sulfur interference, make note in the data assessment.

NOTE: GPC cleanup is not required and is optional. The reviewer should check Project Plan to verify requirement.

11.5 Were the same compounds on Form IX used to check the efficiency of the cleanup procedures? [ ] ___ ✓

11.6 Are percent recoveries (% R) of the pesticide and surrogate compounds used to check the efficiency of the cleanup procedures within QC limits listed on Form IX:

80-120% for florisil cartridge check? [ ] ___ ✓

80-110% for GPC calibration? [ ] ___ ✓

YES NO N/A

Qualify only the analyte(s) which fail the recovery criteria as follows:

ACTION: If % R are < 80%, qualify positive results "J" and quantitation limits "UJ". Non-detects should be qualified "R" if zero %R was obtained for pesticide compounds. Qualify positive results "J" (estimated).

NOTE: If 2,4,5-trichlorophenol was used to measure the efficiency of the Florisil cleanup and the recovery was > 5%, sample data should be evaluated for potential interferences.

12.0 Pesticide Identification

12.1 Has CLP Form X, showing retention time data for positive results on the two GC columns, been completed for every sample in which a pesticide was detected? [✓] ___ ___

ACTION: If no, take action specified in 3.2 above, or compile a list comparing the retention times for all sample hits on the two columns.

12.2 Are there any transcription/calculation errors between raw data and data summary forms (initial calibration summaries, calibration verification summaries, analytical sequence summaries, GPC and Florisil cleanup verification forms)? ___ [✓] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and note error in the data assessment.

12.3 Are retention times (RT) of sample compounds within the established RT windows for both analyses? [✓] ___ ___

Note: Confirmation can be supported by other qualitative techniques such as GC/MS (Method 8270), or GC/AED (Method 8085) if sensitivity permits.

YES NO N/A

ACTION: Qualify as unusable (R) all positive results which were not confirmed by second GC column analysis. Also qualify "R", unusable, all positive results not within RT windows unless associated standard compounds are similarly biased. The reviewer should use professional judgement to assign an appropriate quantitation limit.

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently (see section 9.7 above). Also check for false negatives among the multiple peak compounds toxaphene and chlordane. Were there any false negatives? ___ [✓] ___

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation used as the second column Confirmation? (This is not required). [ ] ___ ✓

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns ~~<25.0%~~? 40.0% [ ] ✓ ___ see Form 10c for flags

NOTE: The method 8081B requires quantitation from one column. The second column is to confirm the presence of an analyte. Calibration for the Confirmation column is a one point calibration. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

Veno-SS05-0002

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Soil	Laboratory ID:	A302428-04	File ID:	2F4027.D
Sampled:	05/14/13 10:30	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 15:22
Solids:	93.37	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3E21001	Sequence:	AA24376		

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
4,4'-DDE	* 1	4.16	3.951167	0.209		2.3	0
4,4'-DDE	2	4.152	3.944	0.208		2.3	0
4,4'-DDD	* 1	4.628	4.432667	0.195		0.078	200 LOD
DBC	* 1	5.482	5.309333	0.173		0.10	0
DBC	2	5.388	5.218833	0.169		0.10	0

* Column used for quantitation

Veno-SD01-000H

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-07	File ID:	2F4029.D
Sampled:	05/15/13 10:30	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 15:46
Solids:	54.93	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3E21001	Sequence:	AA24376		

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD	
4,4'-DDE	* 1	4.159	3.951167	0.208		0.011	16.7	
4,4'-DDE	2	4.151	3.944	0.207		0.013	16.7	
4,4'-DDD	* 1	4.627	4.432667	0.194		0.0084	28.6	NQ
4,4'-DDD	2	4.605	4.413833	0.191		0.0063	28.6	↓
4,4'-DDT	* 1	4.833	4.644667	0.188		0.0032	29.3	NQ
4,4'-DDT	2	4.833	4.646833	0.186		0.0043	29.3	↓
2,4,5,6-TCMX	1	2.152	2.003333	0.149		0.040	11.8	
2,4,5,6-TCMX	* 2	2.035	1.894667	0.14		0.045	11.8	
Decachlorobiphenyl	* 1	6.189	6.021	0.168		0.043	17.7	
Decachlorobiphenyl	2	6.253	6.089167	0.164		0.036	17.7	
DBC	* 1	5.481	5.309333	0.172		0.10	0	
DBC	2	5.387	5.218833	0.168		0.10	0	

* Column used for quantitation

Veno-SD02-000H

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-10	File ID:	2F4015.D
Sampled:	05/15/13 09:15	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 12:57
Solids:	46.92	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3E21001	Sequence:	AA24376		

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
4,4'-DDE	* 1	4.159	3.951167	0.208		0.017	19.4
4,4'-DDE	2	4.152	3.944	0.208		0.014	19.4
4,4'-DDD	* 1	4.626	4.432667	0.193		0.0071	34.7
4,4'-DDD	2	4.606	4.413833	0.192		0.0050	34.7
4,4'-DDT	* 1	4.833	4.644667	0.188		0.0037	31.8
4,4'-DDT	2	4.835	4.646833	0.188		0.0051	31.8
2,4,5,6-TCMX	* 1	2.15	2.003333	0.147		0.047	8.89
2,4,5,6-TCMX	2	2.033	1.894667	0.138		0.043	8.89
Decachlorobiphenyl	* 1	6.188	6.021	0.167		0.052	14.4
Decachlorobiphenyl	2	6.252	6.089167	0.163		0.045	14.4
DBC	* 1	5.481	5.309333	0.172		0.10	0
DBC	2	5.387	5.218833	0.168		0.10	0

NQ

* Column used for quantitation

Veno-SD12-000H

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-12	File ID:	2F4033.D
Sampled:	05/15/13 08:30	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 16:35
Solids:	39.13	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3E21001	Sequence:	AA24376		

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD	
4,4'-DDE	* 1	4.16	3.951167	0.209		0.014	6.9	
4,4'-DDE	2	4.152	3.944	0.208		0.015	6.9	
4,4'-DDD	* 1	4.627	4.432667	0.194		0.0062	43.1	J
4,4'-DDD	2	4.606	4.413833	0.192		0.0040	43.1	↓
4,4'-DDT	* 1	4.821	4.644667	0.176		0.0040	26.1	NQ
4,4'-DDT	2	4.834	4.646833	0.187		0.0052	26.1	↓
2,4,5,6-TCMX	* 1	2.153	2.003333	0.15		0.043	4.76	
2,4,5,6-TCMX	2	2.035	1.894667	0.14		0.041	4.76	
Decachlorobiphenyl	* 1	6.189	6.021	0.168		0.054	20.4	
Decachlorobiphenyl	2	6.253	6.089167	0.164		0.044	20.4	
DBC	* 1	5.481	5.309333	0.172		0.10	0	
DBC	2	5.387	5.218833	0.168		0.10	0	

* Column used for quantitation

Veno-SD02-000H

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302428-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302428-10RE1	File ID:	2FB021.D
Sampled:	05/15/13 09:15	Prepared:	06/03/13 00:44	Analyzed:	06/07/13 14:11
Solids:	46.92	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3F03003	Sequence:	AA24452		

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD	
4,4'-DDE	* 1	4.132	3.951167	0.181		0.012	20.2	
4,4'-DDE	2	4.118	3.944	0.174		0.0098	20.2	
4,4'-DDD	* 1	4.6	4.432667	0.167		0.0055	34	NQ
4,4'-DDD	2	4.573	4.413833	0.159		0.0039	34	↓
2,4,5,6-TCMX	* 1	2.13	2.003333	0.127		0.029	0	
2,4,5,6-TCMX	2	2.01	1.894667	0.115		0.029	0	
Decachlorobiphenyl	* 1	6.166	6.021	0.145		0.037	11.4	
Decachlorobiphenyl	2	6.224	6.089167	0.135		0.033	11.4	
DBC	* 1	5.458	5.309333	0.149		0.10	0	
DBC	2	5.359	5.218833	0.14		0.10	0	

* Column used for quantitation

YES NO N/A

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

% Difference	Qualifier
0-25%	none
26-70%	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected) "NJ"	
>50% (Pesticide vale is <CRQL)	"U"
>201%	"R"

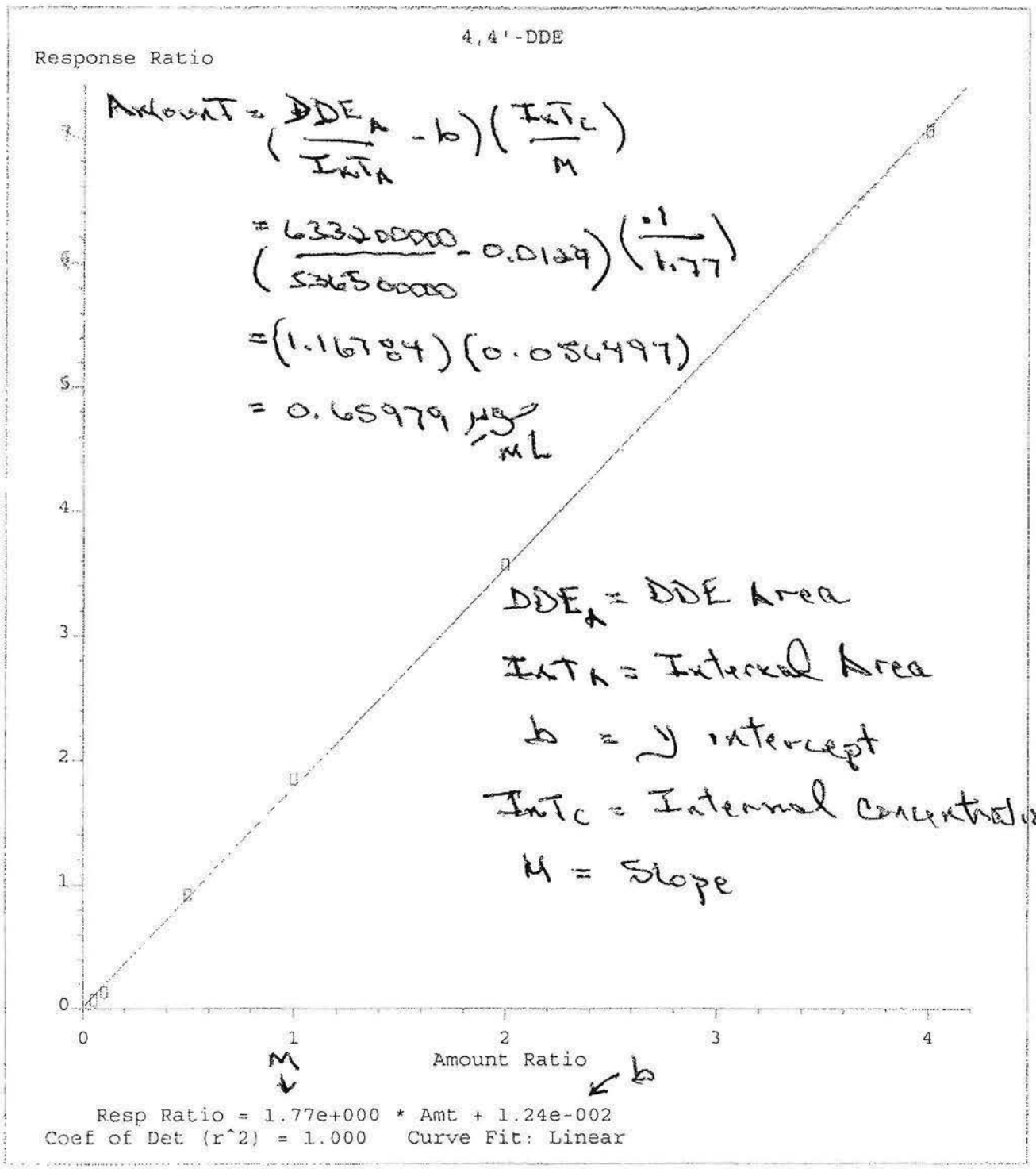
Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that the higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ ✓ ___

NOTE: Single-peak pesticide results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

Ex. Sample #: A302428-04
Reported: DDE 0.066 µg/mL



$$\text{Amount} = \left(\frac{DDE_A}{IntT_A} - b\right)\left(\frac{IntT_C}{M}\right)$$

$$= \left(\frac{63320000}{53650000} - 0.0124\right)\left(\frac{.1}{1.77}\right)$$

$$= (1.16784)(0.056497)$$

$$= 0.65979 \ \mu g/mL$$

DDE_A = DDE Area

$IntT_A$ = Internal Area

b = y intercept

$IntT_C$ = Internal Concentration

M = Slope

Method Name: Z:\2\METHODS\PEST2DJ13.M
Calibration Table Last Updated: Wed Jul 10 09:45:27 2013

YES NO N/A

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? [✓] ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? [✓] ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ [✓] ___

ACTION: Note all system performance problems in the data assessment.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for organochlorine pesticide analysis? [✓] ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference. SS01 SD01

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made to determine the proper identification of field duplicates.

SD01/SD01P

DDE	0.011/0.016	37% RPD	J
DDD	0.0084/0.015	56% RPD	↓
DDT	0.0032/0.0088	93% RPD	↓

SS01/SS01P No + results

Jacqueline Cleveland

From: Marcia Colon <mcolon@encolabs.com>
Sent: Thursday, July 11, 2013 12:43 PM
To: 'Jacqueline Cleveland'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides
Attachments: A302428 REV 8081B.pdf; A302857 REV 8081B.pdf; A302870 REV 8081B.pdf; CTO-037 _Attachment 3 Self-Declaration_La Chiva Lab_FINAL_Signed.pdf; EPA 8081B Calculation.pdf

Hi Jackie-
I have all the information for you. I added in your other 2 email requests to your individual email so I could respond to all the questions/comments.

See my response below. If you need anything else just let me know ☺.

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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ENCO is an eco-friendly lab offering paperless service options, please contact me anytime with questions.

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, July 09, 2013 5:49 PM
To: 'Marcia Colon'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: Laguna La Chiva Pesticides

Hello Marcia,

I have a couple of issues with the pesticides data packages submitted for the CH2M HILL Laguna LaChiva project. SDG numbers affected by this request are A302857, A302870 & A302428.

Questions:

*The continuing calibration check standards do not reflect accurate %Ds based on the response factor values presented. For example: see page 955 in SDG A302857. The RRF for DDE in the ICAL is listed as 165.308 and the RRF for DDE in the CCV is listed as 1.859108. These values are not comparable. There are two form 6 equivalents in the data package and they reflect RRFs that appear to have been calculated two different ways. The CCV forms must reflect RRFs that were consistently calculated. Please look in to this issue and resubmit the CCV forms (form 7 equivalents) to reflect consistent RRFs and correct %Ds.

The wrong internal ID number was included in the curve data. The analyst had corrected this error but didn't let me know, I had already run the data package and so the wrong information was included on the CCV forms. I have rerun the FORM1s for EPA 8081B and the correct RF is included.

*I am not finding closing CCVs for the analytical sequences. Please submit closing CCVs for all sequences to include summary forms and raw data.

I have attached a copy of the attachment 3 where we include our exception that we report using internal standardization.

*Generally column quantitation %RPDs are reported on a form that includes the quantitated value from both columns. The submitted forms does not include both of the quantitated values. Please comment on this to include an explanation of which value you are reporting (highest or lowest quantitated values).

I have rerun the FORM1s, the dual column forms not show both the primary and second column values. I have discussed this with the analyst and from now on we will make sure we report both columns.

Thank you for your help!

Jackie

I have one additional question regarding the pesticides SDGs. When attempting to reproduce the quantitation calculations from raw area I am unable to calculate the values reported on the quantitation pages. However, I am able to produce the reported results from the ug/ml value present on the quantitation pages. Please provide a calculation example that walks me through your quantitation process from raw area counts for one reported positive result for a target compound. Thank you!

The analyst wrote out the calculation and a copy of this has been included.

Thanks for letting me know you are working on the requests. I have an additional question about the pesticides. It looks like the submitted surrogate recovery forms do not include recoveries for both surrogates/columns. For example, there is only one TCMX recovery and one DCB recovery for sample VENO-SD11-000H. Generally, recoveries are reported from both columns for all samples. Please update these forms to include all recoveries for the surrogate compounds. Thank you!

The FORM1s have been rerun. The surrogates & internals have been reported from both columns. Again, I will make sure we start reporting both columns.

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC

636-352-9391
cleve137@charter.net

Jacqueline Cleveland

From:	Marcia Colon <mcolon@encolabs.com>
Sent:	Monday, July 15, 2013 12:23 PM
To:	'Jacqueline Cleveland'
Cc:	'DataQual'; Juliana.Dean@ch2m.com
Subject:	RE: Laguna La Chiva Pesticides
Attachments:	EPA 8081B(AA23829) CURVE PLOTS.PDF

Sorry Jackie-
I meant to send the plots along with me email.

Here you go ☺

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Monday, July 15, 2013 12:26 PM
To: Marcia Colon
Cc: DataQual; <Juliana.Dean@ch2m.com>
Subject: Re: Laguna La Chiva Pesticides

Hi Marcia,

I understand and have information for both curve processing methods. However the calculation example provided by the analyst quanted against the LR curve. That is fine but if all of the quantitation is performed against the LR curves then I need the curve plots for all of the target compounds & surrogates. Will you send those to me please. The only one she sent was for the example, I think it was DDE. Thanks.

Jackie

Sent from my iPhone

On Jul 15, 2013, at 10:41 AM, "Marcia Colon" <mcolon@encolabs.com> wrote:

<image002.jpg>
Hi Jackie-
ENCO analyzes both EPA 8081B and EPA 608 samples, in speaking with the Organics Manager he said that the analyst that processed the curve was using EPA 608 criteria and chose to use linear regressions to meet the 608 criteria, when he did this he did not print out the plots to be included with the curve data. Because we analyze EPA 608 and EPA 8081B samples we process the curve twice, once processed against EPA 608 criteria and then against EPA 8081B criteria. In this case the analyst did not do that, he just processed the curve against the EPA 608 criteria. The curve did meet all the EPA 8081B criteria to report all analytes against response factor.

If you need anything else please let me know.

Thanks!!

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Thursday, July 11, 2013 8:30 PM
To: 'Marcia Colon'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides

Marcia,

Thank you for providing answers/resubmission in response to my request. Based on your response regarding the calculation example it looks like all of your quantitation was performed against the plotted linear regression curves. If that is the case I need you to send me the rest of the curve plots. The analyst sent the plot for DDE as part of her example calculation but she didn't send the other target compounds or the surrogate compounds. It also looks like the continuing calibrations were assessed by comparing the response factors and not for the calculated amounts (%D vs %Drift). Generally if

quantitation is performed via the LR curves the expectation is that %Drifts would be reported. The values are similar and the difference between them will not likely affect the data. I just need a statement as to the labs general practice. Thank you for your help!

Jackie

From: Marcia Colon [mailto:mcolon@encolabs.com]
Sent: Thursday, July 11, 2013 12:43 PM
To: 'Jacqueline Cleveland'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides

Hi Jackie-
I have all the information for you. I added in your other 2 email requests to your individual email so I could respond to all the questions/comments.

See my response below. If you need anything else just let me know ☺.

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, July 09, 2013 5:49 PM
To: 'Marcia Colon'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: Laguna La Chiva Pesticides

Hello Marcia,

I have a couple of issues with the pesticides data packages submitted for the CH2M HILL Laguna LaChiva project. SDG numbers affected by this request are A302857, A302870 & A302428.

Questions:

Jacqueline Cleveland

From: Marcia Colon [mcolon@encolabs.com]
Sent: Tuesday, July 16, 2013 11:48 AM
To: 'Jacqueline Cleveland'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides
Attachments: EPA 8081B LR CURVE PLOTS.pdf

Hi Jackie-
Enclosed are the 3 additional curve plots.

Thanks!!

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Monday, July 15, 2013 8:05 PM
To: 'Marcia Colon'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides
Importance: High

Marcia,

I was working on my calculations tonight and noticed that the pdf file you sent me doesn't contain the curve plots for DDT or either surrogate compound. Will you send those over please? I was hoping to send the DVR to CH2M tomorrow! Thank you!

Jackie

From: Marcia Colon [mailto:mcolon@encolabs.com]
Sent: Monday, July 15, 2013 12:23 PM
To: 'Jacqueline Cleveland'

DataQual

Environmental Services, LLC

CH2M HILL
15010 Conference Center Drive
Suite 200
Chantilly, VA 20151

July 16, 2013
SDG# A302857, ENCO
Vieques East, Puerto Rico- Laguna La Chiva SWMU 1

Dear Mr. Zamboni,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # A302857. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory for the analysis of volatiles, semivolatiles, and pesticides; the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8260B-Rev 2, August 2008-SOP#HW-24, 8270D-Rev 3, October 2006-SOP #HW-22, and 8081B-Rev. 1.0, October 2006-SOP HW-44) and professional judgment. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	VOA	SVOA	Pest
VENO-SD11-000H	A302857-01	soil	X	X	X
VENO-SD11-0H01	A302857-02	soil	X	X	X
VENO-SD10-000H	A302857-03	soil	X	X	X
VENO-SD08-000H	A302857-04	soil	X	X	X
VENO-SD09-000H	A302857-05	soil	X	X	X
VENO-TB01-051613-SD	A302857-06	water	X		
VENO-EB01-051613-SD	A302857-07	water	X	X	X

The following quality control samples were provided with this SDG: sample VENO-EB01-051613-SD-equipment blank and sample VENO-TB01-051613-SD-trip blank.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition
- Technical Holding Times
- GC/MS Tuning *
- GC Performance *
- ICP MS Tuning *
- Initial/Continuing Calibrations
- ICSA/ICSAB Standards *
- LLQ Standards *
- Blanks *
- Internal Standards *
- Surrogate Recoveries

- Laboratory Control Samples *
- Matrix Spike Recoveries NA
- Matrix Duplicate RPDs *
- Serial Dilutions *
- Field Duplicates NA
- Identification/Quantitation
- Reporting Limits *

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

Overall Evaluation of Data/Potential Usability Issues

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

All Fractions

The results for three soil sample were qualified as estimated due to high percent moisture content.

VOA

The initial calibration exhibited a low RRF values which resulted in qualifying the associated sample positive results as estimated and non-detect results as rejected.

Due to non-compliant surrogate recoveries qualifications were added to two samples.

SVOA

One sample re-extraction was completed outside the required holding time; therefore results were qualified as estimated.

The initial and continuing calibrations exhibited a high %RSD and %D values which resulted in qualifying the associated sample results as estimated.

Due to non-compliant surrogate recoveries qualifications were added to one sample.

Pesticides

One sample was re-extracted seven days outside the fourteen day extraction holding time. The sample was re-extracted due to non-compliant surrogate recoveries and the matrix effect was confirmed. Therefore, the RX sample was excluded in favor of the results from the original extraction analysis with a qualifier code of RE.

Qualifications were required due to non-compliant surrogate recoveries.

One compound exhibited a high %D (>20%) due to a decrease in instrument sensitivity. Therefore the compound was qualified as estimated in the samples.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the pesticides fraction. Clarification and additional information was required regarding the calibrations in the pesticide fraction. Some of the reporting forms required modification and resubmission because they were incomplete. Also, an example quantitation calculation was requested. All requested items were received from the laboratory. A copy of the email correspondence is included in the validation worksheets section of this report.

Sample Condition

All Fractions

The following soil samples contained 50-90% water. All reported results in the samples required qualification as estimated (J/UJ).

Sample ID	% Moisture
VENO-SD11-000H	57.61
VENO-SD08-000H	65.34
VENO-SD09-000H	57.16

Technical Holding Times

According to chain of custody records, sampling was performed on 5/16/13 and samples were received on 5/17/13. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the exception of the following.

SVOA

The re-extraction of sample VENO-SD09-000H was completed 8 days outside the 14 day holding time. Therefore results for this sample were qualified as estimated (J/UJ), qualifier code: HT.

Pesticides

The re-extraction of sample VENO-SD11-000H was completed 7 days outside the 14 day holding time. The reanalysis of the sample exhibited recoveries that were <10% for both surrogate compounds. Therefore results for this sample were excluded with the qualifier code: RE.

Initial/Continuing Calibration

VOA

Calibration standards exhibited RRF values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results were qualified as indicated.

Calibration File	Compound(s)	RRF, %RSD, %D	Samples	Q Flag	Q Code
IC 04/09/13	2-butanone	0.0439	VENO-TB01-051613-SD, VENO-EB01-051613-SD	J/R	ICL
	4-methyl-2-pentanone	0.0309			

SVOA

Calibration standards exhibited %RSD and %D values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results were qualified as indicated.

Calibration File	Compound(s)	RRF, %RSD, %D	Samples	Q Flag	Q Code
IC 04/24/13	2,4-dinitrophenol	37.65	all samples	J/UJ	ICH
	2-methyl-4,6-dinitrophenol	30.22			
CC 06/03/13	4-nitrophenol	42.2	VENO-SD11-000H, VENO-SD11-0H01, VENO-SD10-000H, VENO-SD08-000H	J/UJ	CCH
	2,4-dinitrotoluene	21.4			
	4-nitroaniline	27.9			
	butylbenzylphthalate	21.4			
CC 06/05/13	4-nitroaniline	24.0	VENO-EB01-051613-SD	J/UJ	CCH
CC 06/10/13	4-nitrophenol	43.1	VENO-SD09-000HRE	J/UJ	CCH
	4-nitroaniline	23.2			

Pesticides

Calibration standards exhibited a %D value that was non-compliant. A summary of this non-compliance and affected samples is noted in the following table. Sample results were qualified as indicated.

Calibration ID	Compound	%D	Samples	Q Flag	Q Code
2F4003.D, 6/4/13 @ 1028	4,4'-DDT	-20.4	all samples	J/UJ	CCL

Surrogate Recoveries

VOA

The following samples exhibited non-compliant recoveries for the surrogate listed in the table below; qualifications were applied as noted. The samples were not re-analyzed by the laboratory.

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VENO-SD11-000H	4-bromofluorobenzene	83	85-120	J/UJ	SSL
VENO-SD09-000H		84			

SVOA

The following samples exhibited non-compliant recoveries for the surrogate listed in the table below; qualifications were applied as noted. The initial analysis of the sample exhibited zero to 10% recoveries for all surrogates.

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VENO-SD09-000HRE	2-fluorobiphenyl	12	45-105	J/UJ	SSL
	terphenyl-d14	28	30-125	B/N	

Pesticides

The following samples exhibited non-compliant recoveries for the surrogates listed in the table below; qualifications were applied as noted.

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VENO-SD11-000H	2,4,5,6-tetrachloro-m-xylene	24/24	70-125	J/UJ	SSL
VENO-SD11-0H01	2,4,5,6-tetrachloro-m-xylene	34/31	70-125		
	decachlorobiphenyl	52	55-130		
VENO-SD10-000H	2,4,5,6-tetrachloro-m-xylene	64/55	70-125		
VENO-SD08-000H	2,4,5,6-tetrachloro-m-xylene	57/54	70-125		
VENO-SD09-000H	2,4,5,6-tetrachloro-m-xylene	69/62	70-125		

Identification/Quantitation

SVOA

Sample VENO-SD09-000H was re-analyzed due to low surrogate recoveries. The initial analysis exhibited zero to 10% recoveries for all surrogates. The sample was re-extracted out of holding time and exhibited 2 non-compliant surrogate recoveries. The recoveries however were above 10% and therefore the re-analysis was used and the initial analysis was excluded with a qualifier code of RE.

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

Sincerely,

Jacqueline Cleveland

Jacqueline Cleveland
Vice-President

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag	Q Code
VENO-SD11-000H^, VENO-SD08-000H, VENO-SD09-000H^	all results	+/-	J/UJ	%SOL
VENO-TB01-051613-SD, VENO-EB01-051613-SD	2-butanone 4-methyl-2-pentanone	+/-	J/R	ICL
VENO-SD11-000H, VENO-SD09-000H	all results	+/-	J/UJ	SSL

^final qualifier due to non-compliant surrogate recoveries

SVOA

Sample ID	Compound	Results	Q flag	Q Code
VENO-SD11-000H, VENO-SD08-000H, VENO-SD09-000HRE^	all results	+/-	J/UJ	%SOL
VENO-SD09-000HRE	all results	+/-	J/UJ	HT
all samples	2,4-dinitrophenol 2-methyl-4,6-dinitrophenol	+/-	J/UJ	ICH
VENO-SD11-000H*, VENO-SD11-0H01, VENO-SD10-000H, VENO-SD08-000H*	4-nitrophenol 2,4-dinitrotoluene 4-nitroaniline butylbenzylphthalate	+/-	J/UJ	CCH
VENO-EB01-051613-SD	4-nitroaniline	+/-	J/UJ	CCH
VENO-SD09-000HRE^	4-nitrophenol 4-nitroaniline	+/-	J/UJ	CCH
VENO-SD09-000HRE^	base/neutral compound results	+/-	J/UJ	SSL
VENO-SD09-000H	all results	+/-	exclude	RE

^final qualifier due to exceeded extraction holding time
**final qualifier due to high percent moisture*

Pesticides

Sample ID	Compound	Results	Q flag	Q Code
VENO-SD11-000H, VENO-SD08-000H, VENO-SD09-000H	all results	+/-	J/UJ	%SOL
VENO-SD11-000HRE1	all compounds	+/-	exclude	RE
all field soil samples*	all compounds	+/-	J/UJ	SSL
all samples	4,4'-DDT	+/-	J/UJ	CCL

**Please note – the final qualifier for these samples is SSL due to low surrogate recoveries*

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

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

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

Organic Methods

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

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the ICB/CCB/PB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the LOD.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the LOD.
J/UJ -	Sample result is less than 10X LOD when blank result is below the negative LOD.

Glossary of Qualification Flags and Abbreviations, continued

Field QC Blank action:

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

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

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the FB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the FB value when the FB value is greater than the LOD.
J -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the LOD.

General Abbreviations

RL	reporting limit
MDL	method detection limit
IDL	instrument detection limit
LOD	Level of Detection
LOD	Level of Quantitation
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

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

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD11-000H

Laboratory: ENCO Orlando | SDG: A302857-CTO0037

Client: CH2M Hill, Inc. (CH029) | Project: East Vieques La Chiva SWMU 1, CTO-0037

Matrix: Sediment | Laboratory ID: A302857-01 | File ID: 2EP014.D

Sampled: 05/16/13 08:50 | Prepared: 05/21/13 12:35 | Analyzed: 05/21/13 21:08

Solids: 42.39 | Preparation: EPA 5030B_MS | Initial/Final: 4.45 g / 5 mL

Batch: 3E21023 | Sequence: AA24249 | Calibration: 1301045 | Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0027	U UJ	0.0016	0.0027	0.0053
74-87-3	Chloromethane	1	<0.0027	U	0.0017	0.0027	0.0053
75-01-4	Vinyl chloride	1	<0.0027	U	0.0012	0.0027	0.0053
74-83-9	Bromomethane	1	<0.013	U	0.0024	0.013	0.027
75-00-3	Chloroethane	1	<0.0027	U	0.0014	0.0027	0.0053
75-69-4	Trichlorofluoromethane	1	<0.0027	U	0.0014	0.0027	0.0053
76-13-1	Freon 113	1	<0.0027	U	0.0016	0.0027	0.0053
67-64-1	Acetone	1	0.10	J	0.0045	0.033	0.066
75-35-4	1,1-Dichloroethene	1	<0.0027	U UJ	0.0016	0.0027	0.0053
75-15-0	Carbon disulfide	1	0.013	J	0.0056	0.013	0.027
75-09-2	Methylene Chloride	1	<0.013	U UJ	0.0018	0.013	0.027
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0027	U	0.0007	0.0027	0.0053
156-60-5	trans-1,2-Dichloroethene	1	<0.0027	U	0.0018	0.0027	0.0053
156-59-2	cis-1,2-Dichloroethene	1	<0.0027	U	0.0014	0.0027	0.0053
75-34-3	1,1-Dichloroethane	1	<0.0027	U	0.0015	0.0027	0.0053
78-93-3	2-Butanone	1	0.023	J	0.0048	0.0066	0.013
67-66-3	Chloroform	1	<0.0027	U UJ	0.0011	0.0027	0.0053
74-97-5	Bromochloromethane	1	<0.0027	U	0.0009	0.0027	0.0053
71-55-6	1,1,1-Trichloroethane	1	<0.0027	U	0.0009	0.0027	0.0053
79-20-9	Methyl acetate	1	<0.013	U	0.0042	0.013	0.027
110-82-7	Cyclohexane	1	<0.0027	U	0.0014	0.0027	0.0053
108-87-2	Methyl cyclohexane	1	<0.0027	U	0.0014	0.0027	0.0053
56-23-5	Carbon Tetrachloride	1	<0.0027	U	0.0016	0.0027	0.0053
107-06-2	1,2-Dichloroethane	1	<0.0027	U	0.0008	0.0027	0.0053
71-43-2	Benzene	1	<0.0027	U	0.0011	0.0027	0.0053
79-01-6	Trichloroethene	1	<0.0027	U	0.0013	0.0027	0.0053
78-87-5	1,2-Dichloropropane	1	<0.0027	U	0.0015	0.0027	0.0053
75-27-4	Bromodichloromethane	1	<0.0027	U	0.0009	0.0027	0.0053
108-10-1	4-Methyl-2-pentanone	1	<0.0066	U	0.0037	0.0066	0.013
591-78-6	2-Hexanone	1	<0.0066	U	0.0024	0.0066	0.013
10061-01-5	cis-1,3-Dichloropropene	1	<0.0027	U	0.0008	0.0027	0.0053
108-88-3	Toluene	1	<0.0027	U	0.0012	0.0027	0.0053
10061-02-6	trans-1,3-Dichloropropene	1	<0.0027	U	0.0008	0.0027	0.0053
79-00-5	1,1,2-Trichloroethane	1	<0.0027	U	0.0016	0.0027	0.0053

SSL

070713

011

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD11-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-01	File ID:	2EP014.D
Sampled:	05/16/13 08:50	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 21:08
Solids:	42.39	Preparation:	EPA 5030B_MS	Initial/Final:	4.45 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0027	U UJ	0.0013	0.0027	0.0053
124-48-1	Dibromochloromethane	1	<0.0027	U	0.0007	0.0027	0.0053
106-93-4	1,2-Dibromoethane	1	<0.0027	U	0.0008	0.0027	0.0053
108-90-7	Chlorobenzene	1	<0.0027	U	0.0013	0.0027	0.0053
100-41-4	Ethylbenzene	1	<0.0027	U	0.0015	0.0027	0.0053
108-38-3/106-42-3	m,p-Xylenes	1	<0.0053	U	0.0026	0.0053	0.011
95-47-6	o-Xylene	1	<0.0027	U	0.0014	0.0027	0.0053
75-25-2	Bromoform	1	<0.0027	U	0.0008	0.0027	0.0053
100-42-5	Styrene	1	<0.0027	U	0.0012	0.0027	0.0053
98-82-8	Isopropylbenzene	1	<0.0027	U	0.0014	0.0027	0.0053
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0027	U	0.0008	0.0027	0.0053
120-82-1	1,2,4-Trichlorobenzene	1	<0.0027	U	0.0023	0.0027	0.0053
541-73-1	1,3-Dichlorobenzene	1	<0.0027	U	0.0012	0.0027	0.0053
106-46-7	1,4-Dichlorobenzene	1	<0.0027	U	0.0012	0.0027	0.0053
95-50-1	1,2-Dichlorobenzene	1	<0.0027	U	0.0012	0.0027	0.0053
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0027	U	0.0015	0.0027	0.0053
87-61-6	1,2,3-Trichlorobenzene	1	<0.0027	U	0.0024	0.0027	0.0053

SSL

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.133	0.11	84	74 - 133	
Toluene-d8	0.133	0.12	92	85 - 115	
4-Bromofluorobenzene	0.133	0.11	83	85 - 120	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1172543	11.31	1249106	11.31	
1,4-Difluorobenzene	1828077	11.88	1940286	11.88	
Chlorobenzene-d5	1553489	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	696312	16.89	841846	16.89	

* Values outside of QC limits

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012

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD11-0H01

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-02	File ID:	2EP015.D
Sampled:	05/16/13 09:00	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 21:40
Solids:	95.14	Preparation:	EPA 5030B_MS	Initial/Final:	4.49 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	ONC. (mg/kg dry	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0012	U	0.0007	0.0012	0.0023
74-87-3	Chloromethane	1	<0.0012	U	0.0008	0.0012	0.0023
75-01-4	Vinyl chloride	1	<0.0012	U	0.0005	0.0012	0.0023
74-83-9	Bromomethane	1	<0.0059	U	0.0011	0.0059	0.012
75-00-3	Chloroethane	1	<0.0012	U	0.0006	0.0012	0.0023
75-69-4	Trichlorofluoromethane	1	<0.0012	U	0.0006	0.0012	0.0023
76-13-1	Freon 113	1	<0.0012	U	0.0007	0.0012	0.0023
67-64-1	Acetone	1	0.037		0.0020	0.015	0.029
75-35-4	1,1-Dichloroethene	1	<0.0012	U	0.0007	0.0012	0.0023
75-15-0	Carbon disulfide	1	0.021		0.0025	0.0059	0.012
75-09-2	Methylene Chloride	1	<0.0059	U	0.0008	0.0059	0.012
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0012	U	0.0003	0.0012	0.0023
156-60-5	trans-1,2-Dichloroethene	1	<0.0012	U	0.0008	0.0012	0.0023
156-59-2	cis-1,2-Dichloroethene	1	<0.0012	U	0.0006	0.0012	0.0023
75-34-3	1,1-Dichloroethane	1	<0.0012	U	0.0007	0.0012	0.0023
78-93-3	2-Butanone	1	0.0083		0.0021	0.0029	0.0059
67-66-3	Chloroform	1	<0.0012	U	0.0005	0.0012	0.0023
74-97-5	Bromochloromethane	1	<0.0012	U	0.0004	0.0012	0.0023
71-55-6	1,1,1-Trichloroethane	1	<0.0012	U	0.0004	0.0012	0.0023
79-20-9	Methyl acetate	1	<0.0059	U	0.0019	0.0059	0.012
110-82-7	Cyclohexane	1	<0.0012	U	0.0006	0.0012	0.0023
108-87-2	Methyl cyclohexane	1	<0.0012	U	0.0006	0.0012	0.0023
56-23-5	Carbon Tetrachloride	1	<0.0012	U	0.0007	0.0012	0.0023
107-06-2	1,2-Dichloroethane	1	<0.0012	U	0.0004	0.0012	0.0023
71-43-2	Benzene	1	<0.0012	U	0.0005	0.0012	0.0023
79-01-6	Trichloroethene	1	<0.0012	U	0.0006	0.0012	0.0023
78-87-5	1,2-Dichloropropane	1	<0.0012	U	0.0006	0.0012	0.0023
75-27-4	Bromodichloromethane	1	<0.0012	U	0.0004	0.0012	0.0023
108-10-1	4-Methyl-2-pentanone	1	<0.0029	U	0.0016	0.0029	0.0059
591-78-6	2-Hexanone	1	<0.0029	U	0.0011	0.0029	0.0059
10061-01-5	cis-1,3-Dichloropropene	1	<0.0012	U	0.0004	0.0012	0.0023
108-88-3	Toluene	1	<0.0012	U	0.0005	0.0012	0.0023
10061-02-6	trans-1,3-Dichloropropene	1	<0.0012	U	0.0004	0.0012	0.0023
79-00-5	1,1,2-Trichloroethane	1	<0.0012	U	0.0007	0.0012	0.0023

070713

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD11-0H01

Laboratory:	ENCO Orlando	SDG:	A302857-CTQ0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-02	File ID:	2EP015.D
Sampled:	05/16/13 09:00	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 21:40
Solids:	95.14	Preparation:	EPA 5030B_MS	Initial/Final:	4.49 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0012	U	0.0006	0.0012	0.0023
124-48-1	Dibromochloromethane	1	<0.0012	U	0.0003	0.0012	0.0023
106-93-4	1,2-Dibromoethane	1	<0.0012	U	0.0004	0.0012	0.0023
108-90-7	Chlorobenzene	1	<0.0012	U	0.0006	0.0012	0.0023
100-41-4	Ethylbenzene	1	<0.0012	U	0.0007	0.0012	0.0023
108-38-3/106-42-3	m,p-Xylenes	1	<0.0023	U	0.0012	0.0023	0.0047
95-47-6	o-Xylene	1	<0.0012	U	0.0006	0.0012	0.0023
75-25-2	Bromoform	1	<0.0012	U	0.0004	0.0012	0.0023
100-42-5	Styrene	1	<0.0012	U	0.0005	0.0012	0.0023
98-82-8	Isopropylbenzene	1	<0.0012	U	0.0006	0.0012	0.0023
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0012	U	0.0004	0.0012	0.0023
120-82-1	1,2,4-Trichlorobenzene	1	<0.0012	U	0.0010	0.0012	0.0023
541-73-1	1,3-Dichlorobenzene	1	<0.0012	U	0.0006	0.0012	0.0023
106-46-7	1,4-Dichlorobenzene	1	<0.0012	U	0.0005	0.0012	0.0023
95-50-1	1,2-Dichlorobenzene	1	<0.0012	U	0.0005	0.0012	0.0023
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0012	U	0.0007	0.0012	0.0023
87-61-6	1,2,3-Trichlorobenzene	1	<0.0012	U	0.0011	0.0012	0.0023

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.0585	0.051	87	74 - 133	
Toluene-d8	0.0585	0.056	95	85 - 115	
4-Bromofluorobenzene	0.0585	0.050	86	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1199766	11.31	1249106	11.31	
1,4-Difluorobenzene	1858848	11.89	1940286	11.88	
Chlorobenzene-d5	1557244	14.55	1665139	14.55	
1,4-Dichlorobenzene-d4	688707	16.89	841846	16.89	

* Values outside of QC limits

VM 070713

014

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD10-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-03	File ID:	2EP016.D
Sampled:	05/16/13 09:50	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 22:11
Solids:	52.32	Preparation:	EPA 5030B_MS	Initial/Final:	5.13 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	ONC. (mg/kg dry	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0019	U	0.0012	0.0019	0.0038
74-87-3	Chloromethane	1	<0.0019	U	0.0012	0.0019	0.0038
75-01-4	Vinyl chloride	1	<0.0019	U	0.0008	0.0019	0.0038
74-83-9	Bromomethane	1	<0.0096	U	0.0017	0.0096	0.019
75-00-3	Chloroethane	1	<0.0019	U	0.0010	0.0019	0.0038
75-69-4	Trichlorofluoromethane	1	<0.0019	U	0.0010	0.0019	0.0038
76-13-1	Freon 113	1	<0.0019	U	0.0011	0.0019	0.0038
67-64-1	Acetone	1	0.12		0.0032	0.024	0.048
75-35-4	1,1-Dichloroethene	1	<0.0019	U	0.0012	0.0019	0.0038
75-15-0	Carbon disulfide	1	<0.0096	U	0.0040	0.0096	0.019
75-09-2	Methylene Chloride	1	<0.0096	U	0.0013	0.0096	0.019
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0019	U	0.0005	0.0019	0.0038
156-60-5	trans-1,2-Dichloroethene	1	<0.0019	U	0.0013	0.0019	0.0038
156-59-2	cis-1,2-Dichloroethene	1	<0.0019	U	0.0010	0.0019	0.0038
75-34-3	1,1-Dichloroethane	1	<0.0019	U	0.0011	0.0019	0.0038
78-93-3	2-Butanone	1	0.024		0.0034	0.0048	0.0096
67-66-3	Chloroform	1	<0.0019	U	0.0008	0.0019	0.0038
74-97-5	Bromochloromethane	1	<0.0019	U	0.0007	0.0019	0.0038
71-55-6	1,1,1-Trichloroethane	1	<0.0019	U	0.0007	0.0019	0.0038
79-20-9	Methyl acetate	1	<0.0096	U	0.0031	0.0096	0.019
110-82-7	Cyclohexane	1	<0.0019	U	0.0010	0.0019	0.0038
108-87-2	Methyl cyclohexane	1	<0.0019	U	0.0010	0.0019	0.0038
56-23-5	Carbon Tetrachloride	1	<0.0019	U	0.0011	0.0019	0.0038
107-06-2	1,2-Dichloroethane	1	<0.0019	U	0.0006	0.0019	0.0038
71-43-2	Benzene	1	<0.0019	U	0.0008	0.0019	0.0038
79-01-6	Trichloroethene	1	<0.0019	U	0.0010	0.0019	0.0038
78-87-5	1,2-Dichloropropane	1	<0.0019	U	0.0011	0.0019	0.0038
75-27-4	Bromodichloromethane	1	<0.0019	U	0.0007	0.0019	0.0038
108-10-1	4-Methyl-2-pentanone	1	<0.0048	U	0.0027	0.0048	0.0096
591-78-6	2-Hexanone	1	<0.0048	U	0.0017	0.0048	0.0096
10061-01-5	cis-1,3-Dichloropropene	1	<0.0019	U	0.0006	0.0019	0.0038
108-88-3	Toluene	1	<0.0019	U	0.0009	0.0019	0.0038
10061-02-6	trans-1,3-Dichloropropene	1	<0.0019	U	0.0006	0.0019	0.0038
79-00-5	1,1,2-Trichloroethane	1	<0.0019	U	0.0011	0.0019	0.0038

MM 070713

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD10-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-03	File ID:	2EP016.D
Sampled:	05/16/13 09:50	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 22:11
Solids:	52.32	Preparation:	EPA 5030B MS	Initial/Final:	5.13 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0019	U	0.0009	0.0019	0.0038
124-48-1	Dibromochloromethane	1	<0.0019	U	0.0005	0.0019	0.0038
106-93-4	1,2-Dibromoethane	1	<0.0019	U	0.0006	0.0019	0.0038
108-90-7	Chlorobenzene	1	<0.0019	U	0.0009	0.0019	0.0038
100-41-4	Ethylbenzene	1	<0.0019	U	0.0011	0.0019	0.0038
108-38-3/106-42-3	m,p-Xylenes	1	<0.0038	U	0.0019	0.0038	0.0076
95-47-6	o-Xylene	1	<0.0019	U	0.0010	0.0019	0.0038
75-25-2	Bromoform	1	0.0007	J	0.0006	0.0019	0.0038
100-42-5	Styrene	1	<0.0019	U	0.0008	0.0019	0.0038
98-82-8	Isopropylbenzene	1	<0.0019	U	0.0010	0.0019	0.0038
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0019	U	0.0006	0.0019	0.0038
120-82-1	1,2,4-Trichlorobenzene	1	<0.0019	U	0.0016	0.0019	0.0038
541-73-1	1,3-Dichlorobenzene	1	<0.0019	U	0.0009	0.0019	0.0038
106-46-7	1,4-Dichlorobenzene	1	<0.0019	U	0.0009	0.0019	0.0038
95-50-1	1,2-Dichlorobenzene	1	<0.0019	U	0.0008	0.0019	0.0038
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0019	U	0.0011	0.0019	0.0038
87-61-6	1,2,3-Trichlorobenzene	1	<0.0019	U	0.0017	0.0019	0.0038

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.0931	0.080	86	74 - 133	
Toluene-d8	0.0931	0.089	95	85 - 115	
4-Bromofluorobenzene	0.0931	0.081	87	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1166371	11.31	1249106	11.31	
1,4-Difluorobenzene	1808213	11.89	1940286	11.88	
Chlorobenzene-d5	1542682	14.55	1665139	14.55	
1,4-Dichlorobenzene-d4	709861	16.89	841846	16.89	

* Values outside of QC limits

VM 6/10/13

016

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD08-000H

Laboratory: ENCO Orlando SDG: A302857-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Matrix: Sediment Laboratory ID: A302857-04 File ID: 2EP017.D

Sampled: 05/16/13 10:15 Prepared: 05/21/13 12:35 Analyzed: 05/21/13 22:43

Solids: 34.66 Preparation: EPA 5030B_MS Initial/Final: 4.01 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0036	U UJ	0.0022	0.0036	0.0072
74-87-3	Chloromethane	1	<0.0036	U	0.0023	0.0036	0.0072
75-01-4	Vinyl chloride	1	<0.0036	U	0.0016	0.0036	0.0072
74-83-9	Bromomethane	1	<0.018	U	0.0032	0.018	0.036
75-00-3	Chloroethane	1	<0.0036	U	0.0019	0.0036	0.0072
75-69-4	Trichlorofluoromethane	1	<0.0036	U	0.0019	0.0036	0.0072
76-13-1	Freon 113	1	<0.0036	U	0.0022	0.0036	0.0072
67-64-1	Acetone	1	0.095	J	0.0061	0.045	0.090
75-35-4	1,1-Dichloroethene	1	<0.0036	U UJ	0.0022	0.0036	0.0072
75-15-0	Carbon disulfide	1	0.034	J	0.0076	0.018	0.036
75-09-2	Methylene Chloride	1	<0.018	U UJ	0.0025	0.018	0.036
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0036	U	0.0010	0.0036	0.0072
156-60-5	trans-1,2-Dichloroethene	1	<0.0036	U	0.0025	0.0036	0.0072
156-59-2	cis-1,2-Dichloroethene	1	<0.0036	U	0.0019	0.0036	0.0072
75-34-3	1,1-Dichloroethane	1	<0.0036	U	0.0021	0.0036	0.0072
78-93-3	2-Butanone	1	0.017	J	0.0065	0.0090	0.018
67-66-3	Chloroform	1	<0.0036	U UJ	0.0015	0.0036	0.0072
74-97-5	Bromochloromethane	1	<0.0036	U	0.0013	0.0036	0.0072
71-55-6	1,1,1-Trichloroethane	1	<0.0036	U	0.0013	0.0036	0.0072
79-20-9	Methyl acetate	1	<0.018	U	0.0058	0.018	0.036
110-82-7	Cyclohexane	1	<0.0036	U	0.0019	0.0036	0.0072
108-87-2	Methyl cyclohexane	1	<0.0036	U	0.0019	0.0036	0.0072
56-23-5	Carbon Tetrachloride	1	<0.0036	U	0.0022	0.0036	0.0072
107-06-2	1,2-Dichloroethane	1	<0.0036	U	0.0012	0.0036	0.0072
71-43-2	Benzene	1	<0.0036	U	0.0014	0.0036	0.0072
79-01-6	Trichloroethene	1	<0.0036	U	0.0018	0.0036	0.0072
78-87-5	1,2-Dichloropropane	1	<0.0036	U	0.0020	0.0036	0.0072
75-27-4	Bromodichloromethane	1	<0.0036	U	0.0013	0.0036	0.0072
108-10-1	4-Methyl-2-pentanone	1	<0.0090	U	0.0050	0.0090	0.018
591-78-6	2-Hexanone	1	<0.0090	U	0.0033	0.0090	0.018
10061-01-5	cis-1,3-Dichloropropene	1	<0.0036	U	0.0011	0.0036	0.0072
108-88-3	Toluene	1	<0.0036	U	0.0017	0.0036	0.0072
10061-02-6	trans-1,3-Dichloropropene	1	<0.0036	U	0.0011	0.0036	0.0072
79-00-5	1,1,2-Trichloroethane	1	<0.0036	U	0.0022	0.0036	0.0072

%SD1

UM 070713

017

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD08-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-04	File ID:	2EP017.D
Sampled:	05/16/13 10:15	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 22:43
Solids:	34.66	Preparation:	EPA 5030B_MS	Initial/Final:	4.01 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0036	U UJ	0.0018	0.0036	0.0072
124-48-1	Dibromochloromethane	1	<0.0036	U	0.0009	0.0036	0.0072
106-93-4	1,2-Dibromoethane	1	<0.0036	U	0.0011	0.0036	0.0072
108-90-7	Chlorobenzene	1	<0.0036	U	0.0017	0.0036	0.0072
100-41-4	Ethylbenzene	1	<0.0036	U	0.0020	0.0036	0.0072
108-38-3/106-42-3	m,p-Xylenes	1	<0.0072	U	0.0036	0.0072	0.014
95-47-6	o-Xylene	1	<0.0036	U	0.0019	0.0036	0.0072
75-25-2	Bromoform	1	<0.0036	U	0.0011	0.0036	0.0072
100-42-5	Styrene	1	<0.0036	U	0.0016	0.0036	0.0072
98-82-8	Isopropylbenzene	1	<0.0036	U	0.0019	0.0036	0.0072
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0036	U	0.0011	0.0036	0.0072
120-82-1	1,2,4-Trichlorobenzene	1	<0.0036	U	0.0031	0.0036	0.0072
541-73-1	1,3-Dichlorobenzene	1	<0.0036	U	0.0017	0.0036	0.0072
106-46-7	1,4-Dichlorobenzene	1	<0.0036	U	0.0016	0.0036	0.0072
95-50-1	1,2-Dichlorobenzene	1	<0.0036	U	0.0016	0.0036	0.0072
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0036	U	0.0021	0.0036	0.0072
87-61-6	1,2,3-Trichlorobenzene	1	<0.0036	U	0.0033	0.0036	0.0072

% SOL

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.180	0.16	86	74 - 133	
Toluene-d8	0.180	0.17	96	85 - 115	
4-Bromofluorobenzene	0.180	0.15	86	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1177146	11.31	1249106	11.31	
1,4-Difluorobenzene	1815907	11.89	1940286	11.88	
Chlorobenzene-d5	1545312	14.55	1665139	14.55	
1,4-Dichlorobenzene-d4	684800	16.89	841846	16.89	

* Values outside of QC limits

LM 070713

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD09-000H

Laboratory:	ENCO Orlando			SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)			Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Sediment	Laboratory ID:	A302857-05	File ID:	2EP018.D
Sampled:	05/16/13 10:45	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 23:14
Solids:	42.84	Preparation:	EPA 5030B_MS	Initial/Final:	4.82 g / 5 mL
Batch:	3E21023	Sequence:	AA24249	Calibration:	1301045	Instrument:	OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0023	U UJ	0.0014	0.0023	0.0047
74-87-3	Chloromethane	1	<0.0023	U	0.0015	0.0023	0.0047
75-01-4	Vinyl chloride	1	<0.0023	U	0.0010	0.0023	0.0047
74-83-9	Bromomethane	1	<0.012	U	0.0021	0.012	0.023
75-00-3	Chloroethane	1	<0.0023	U	0.0013	0.0023	0.0047
75-69-4	Trichlorofluoromethane	1	<0.0023	U	0.0013	0.0023	0.0047
76-13-1	Freon 113	1	<0.0023	U	0.0014	0.0023	0.0047
67-64-1	Acetone	1	0.043	J	0.0040	0.029	0.058
75-35-4	1,1-Dichloroethene	1	<0.0023	U UJ	0.0014	0.0023	0.0047
75-15-0	Carbon disulfide	1	0.025	J	0.0049	0.012	0.023
75-09-2	Methylene Chloride	1	<0.012	U UJ	0.0016	0.012	0.023
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0023	U	0.0006	0.0023	0.0047
156-60-5	trans-1,2-Dichloroethene	1	<0.0023	U	0.0016	0.0023	0.0047
156-59-2	cis-1,2-Dichloroethene	1	<0.0023	U	0.0012	0.0023	0.0047
75-34-3	1,1-Dichloroethane	1	<0.0023	U	0.0013	0.0023	0.0047
78-93-3	2-Butanone	1	0.0078	J	0.0042	0.0058	0.012
67-66-3	Chloroform	1	<0.0023	U UJ	0.0010	0.0023	0.0047
74-97-5	Bromochloromethane	1	<0.0023	U	0.0008	0.0023	0.0047
71-55-6	1,1,1-Trichloroethane	1	<0.0023	U	0.0008	0.0023	0.0047
79-20-9	Methyl acetate	1	<0.012	U	0.0037	0.012	0.023
110-82-7	Cyclohexane	1	<0.0023	U	0.0012	0.0023	0.0047
108-87-2	Methyl cyclohexane	1	<0.0023	U	0.0012	0.0023	0.0047
56-23-5	Carbon Tetrachloride	1	<0.0023	U	0.0014	0.0023	0.0047
107-06-2	1,2-Dichloroethane	1	<0.0023	U	0.0007	0.0023	0.0047
71-43-2	Benzene	1	<0.0023	U	0.0009	0.0023	0.0047
79-01-6	Trichloroethene	1	<0.0023	U	0.0012	0.0023	0.0047
78-87-5	1,2-Dichloropropane	1	<0.0023	U	0.0013	0.0023	0.0047
75-27-4	Bromodichloromethane	1	<0.0023	U	0.0008	0.0023	0.0047
108-10-1	4-Methyl-2-pentanone	1	<0.0058	U	0.0033	0.0058	0.012
591-78-6	2-Hexanone	1	<0.0058	U	0.0021	0.0058	0.012
10061-01-5	cis-1,3-Dichloropropene	1	<0.0023	U	0.0007	0.0023	0.0047
108-88-3	Toluene	1	<0.0023	U	0.0011	0.0023	0.0047
10061-02-6	trans-1,3-Dichloropropene	1	<0.0023	U	0.0007	0.0023	0.0047
79-00-5	1,1,2-Trichloroethane	1	<0.0023	U	0.0014	0.0023	0.0047

SSL

070713

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-SD09-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-05	File ID:	2EP018.D
Sampled:	05/16/13 10:45	Prepared:	05/21/13 12:35	Analyzed:	05/21/13 23:14
Solids:	42.84	Preparation:	EPA 5030B_MS	Initial/Final:	4.82 g / 5 mL

Batch: 3E21023 Sequence: AA24249 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0023	U UJ	0.0011	0.0023	0.0047
124-48-1	Dibromochloromethane	1	<0.0023	U	0.0006	0.0023	0.0047
106-93-4	1,2-Dibromoethane	1	<0.0023	U	0.0007	0.0023	0.0047
108-90-7	Chlorobenzene	1	<0.0023	U	0.0011	0.0023	0.0047
100-41-4	Ethylbenzene	1	<0.0023	U	0.0013	0.0023	0.0047
108-38-3/106-42-3	m,p-Xylenes	1	<0.0047	U	0.0023	0.0047	0.0093
95-47-6	o-Xylene	1	<0.0023	U	0.0012	0.0023	0.0047
75-25-2	Bromoform	1	<0.0023	U	0.0007	0.0023	0.0047
100-42-5	Styrene	1	<0.0023	U	0.0010	0.0023	0.0047
98-82-8	Isopropylbenzene	1	<0.0023	U	0.0013	0.0023	0.0047
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0023	U	0.0007	0.0023	0.0047
120-82-1	1,2,4-Trichlorobenzene	1	<0.0023	U	0.0020	0.0023	0.0047
541-73-1	1,3-Dichlorobenzene	1	<0.0023	U	0.0011	0.0023	0.0047
106-46-7	1,4-Dichlorobenzene	1	<0.0023	U	0.0011	0.0023	0.0047
95-50-1	1,2-Dichlorobenzene	1	<0.0023	U	0.0010	0.0023	0.0047
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0023	U	0.0013	0.0023	0.0047
87-61-6	1,2,3-Trichlorobenzene	1	<0.0023	U	0.0021	0.0023	0.0047

SSL

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.121	0.11	88	74 - 133	
Toluene-d8	0.121	0.12	96	85 - 115	
4-Bromofluorobenzene	0.121	0.10	84	85 - 120	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1167258	11.31	1249106	11.31	
1,4-Difluorobenzene	1786737	11.89	1940286	11.88	
Chlorobenzene-d5	1557837	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	707664	16.89	841846	16.89	

* Values outside of QC limits

WM 070713

020

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-TB01-051613-SD

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302857-06	File ID:	3ES008.D
Sampled:	05/16/13 11:50	Prepared:	05/24/13 12:57	Analyzed:	05/24/13 17:14
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 3E24030 Sequence: AA24312 Calibration: 1304028 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ	
75-71-8	Dichlorodifluoromethane	1	<1.0	U	0.74	1.0	2.0	
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0	
75-01-4	Vinyl chloride	1	<1.0	U	0.71	1.0	2.0	
74-83-9	Bromomethane	1	<1.0	U	0.95	1.0	2.0	
75-00-3	Chloroethane	1	<1.0	U	0.98	1.0	2.0	
75-69-4	Trichlorofluoromethane	1	<1.0	U	0.94	1.0	2.0	
76-13-1	Freon 113	1	<1.0	U	0.73	1.0	2.0	
67-64-1	Acetone	1	<12	U	1.8	12	25	
75-35-4	1,1-Dichloroethene	1	<1.0	U	0.94	1.0	2.0	
75-15-0	Carbon disulfide	1	<5.0	U	2.6	5.0	10	
75-09-2	Methylene Chloride	1	<5.0	U	0.71	5.0	10	
1634-04-4	Methyl-tert-Butyl Ether	1	<1.0	U	0.60	1.0	2.0	
156-60-5	trans-1,2-Dichloroethene	1	<1.0	U	0.73	1.0	2.0	
156-59-2	cis-1,2-Dichloroethene	1	<1.0	U	0.53	1.0	2.0	
75-34-3	1,1-Dichloroethane	1	<1.0	U	0.62	1.0	2.0	
78-93-3	2-Butanone	1	<12	~~U~~ R	4.5	12	25	ICL
67-66-3	Chloroform	1	<1.0	U	0.80	1.0	2.0	
74-97-5	Bromochloromethane	1	<1.0	U	0.94	1.0	2.0	
71-55-6	1,1,1-Trichloroethane	1	<1.0	U	0.80	1.0	2.0	
79-20-9	Methyl acetate	1	<1.0	U	0.95	1.0	2.0	
110-82-7	Cyclohexane	1	<1.0	U	0.93	1.0	2.0	
108-87-2	Methyl cyclohexane	1	<1.0	U	0.64	1.0	2.0	
56-23-5	Carbon Tetrachloride	1	<1.0	U	0.94	1.0	2.0	
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0	
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0	
79-01-6	Trichloroethene	1	<1.0	U	0.89	1.0	2.0	
78-87-5	1,2-Dichloropropane	1	<1.0	U	0.80	1.0	2.0	
75-27-4	Bromodichloromethane	1	<1.0	U	0.52	1.0	2.0	
108-10-1	4-Methyl-2-pentanone	1	<2.5	~~U~~ R	0.79	2.5	5.0	ICL
591-78-6	2-Hexanone	1	<2.5	U	1.4	2.5	5.0	
10061-01-5	cis-1,3-Dichloropropene	1	<1.0	U	0.59	1.0	2.0	
108-88-3	Toluene	1	<1.0	U	0.72	1.0	2.0	
10061-02-6	trans-1,3-Dichloropropene	1	<1.0	U	0.73	1.0	2.0	
79-00-5	1,1,2-Trichloroethane	1	<1.0	U	0.76	1.0	2.0	

070713

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-TB01-051613-SD

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302857-06	File ID:	3ES008.D
Sampled:	05/16/13 11:50	Prepared:	05/24/13 12:57	Analyzed:	05/24/13 17:14
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 3E24030 Sequence: AA24312 Calibration: 1304028 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
124-48-1	Dibromochloromethane	1	<1.0	U	0.44	1.0	2.0
106-93-4	1,2-Dibromoethane	1	<1.0	U	0.78	1.0	2.0
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
108-38-3/106-42-3	m,p-Xylenes	1	<2.0	U	1.3	2.0	4.0
95-47-6	o-Xylene	1	<1.0	U	0.53	1.0	2.0
75-25-2	Bromoform	1	<1.0	U	0.75	1.0	2.0
100-42-5	Styrene	1	<1.0	U	0.61	1.0	2.0
98-82-8	Isopropylbenzene	1	<1.0	U	0.67	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
120-82-1	1,2,4-Trichlorobenzene	1	<1.0	U	0.70	1.0	2.0
541-73-1	1,3-Dichlorobenzene	1	<1.0	U	0.77	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0
95-50-1	1,2-Dichlorobenzene	1	<1.0	U	0.73	1.0	2.0
96-12-8	1,2-Dibromo-3-chloropropane	1	<5.0	U	0.96	5.0	10
87-61-6	1,2,3-Trichlorobenzene	1	<1.0	U	0.86	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	53	106	85 - 115	
Toluene-d8	50.0	54	108	85 - 120	
4-Bromofluorobenzene	50.0	52	104	75 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1289513	11.47	1457190	11.48	
1,4-Difluorobenzene	1907923	12.05	2274265	12.06	
Chlorobenzene-d5	1728741	14.75	2013436	14.76	
1,4-Dichlorobenzene-d4	816694	17.13	916476	17.15	

* Values outside of QC limits

WM 070713

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-EB01-051613-SD

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302857-07	File ID:	3ES009.D
Sampled:	05/16/13 06:45	Prepared:	05/24/13 12:57	Analyzed:	05/24/13 17:44
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 3E24030 Sequence: AA24312 Calibration: 1304028 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<1.0	U	0.74	1.0	2.0
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0
75-01-4	Vinyl chloride	1	<1.0	U	0.71	1.0	2.0
74-83-9	Bromomethane	1	<1.0	U	0.95	1.0	2.0
75-00-3	Chloroethane	1	<1.0	U	0.98	1.0	2.0
75-69-4	Trichlorofluoromethane	1	<1.0	U	0.94	1.0	2.0
76-13-1	Freon 113	1	<1.0	U	0.73	1.0	2.0
67-64-1	Acetone	1	<12	U	1.8	12	25
75-35-4	1,1-Dichloroethene	1	<1.0	U	0.94	1.0	2.0
75-15-0	Carbon disulfide	1	<5.0	U	2.6	5.0	10
75-09-2	Methylene Chloride	1	<5.0	U	0.71	5.0	10
1634-04-4	Methyl-tert-Butyl Ether	1	<1.0	U	0.60	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	<1.0	U	0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene	1	<1.0	U	0.53	1.0	2.0
75-34-3	1,1-Dichloroethane	1	<1.0	U	0.62	1.0	2.0
78-93-3	2-Butanone	1	<12	~~U~~ R	4.5	12	25 ICL
67-66-3	Chloroform	1	<1.0	U	0.80	1.0	2.0
74-97-5	Bromochloromethane	1	<1.0	U	0.94	1.0	2.0
71-55-6	1,1,1-Trichloroethane	1	<1.0	U	0.80	1.0	2.0
79-20-9	Methyl acetate	1	<1.0	U	0.95	1.0	2.0
110-82-7	Cyclohexane	1	<1.0	U	0.93	1.0	2.0
108-87-2	Methyl cyclohexane	1	<1.0	U	0.64	1.0	2.0
56-23-5	Carbon Tetrachloride	1	<1.0	U	0.94	1.0	2.0
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0
79-01-6	Trichloroethene	1	<1.0	U	0.89	1.0	2.0
78-87-5	1,2-Dichloropropane	1	<1.0	U	0.80	1.0	2.0
75-27-4	Bromodichloromethane	1	<1.0	U	0.52	1.0	2.0
108-10-1	4-Methyl-2-pentanone	1	<2.5	~~U~~ R	0.79	2.5	5.0 ICL
591-78-6	2-Hexanone	1	<2.5	U	1.4	2.5	5.0
10061-01-5	cis-1,3-Dichloropropene	1	<1.0	U	0.59	1.0	2.0
108-88-3	Toluene	1	<1.0	U	0.72	1.0	2.0
10061-02-6	trans-1,3-Dichloropropene	1	<1.0	U	0.73	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U	0.76	1.0	2.0

070713

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

Veno-EB01-051613-SD

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302857-07	File ID:	3ES009.D
Sampled:	05/16/13 06:45	Prepared:	05/24/13 12:57	Analyzed:	05/24/13 17:44
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 3E24030 Sequence: AA24312 Calibration: 1304028 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
124-48-1	Dibromochloromethane	1	<1.0	U	0.44	1.0	2.0
106-93-4	1,2-Dibromoethane	1	<1.0	U	0.78	1.0	2.0
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
108-38-3/106-42-3	m,p-Xylenes	1	<2.0	U	1.3	2.0	4.0
95-47-6	o-Xylene	1	<1.0	U	0.53	1.0	2.0
75-25-2	Bromoform	1	<1.0	U	0.75	1.0	2.0
100-42-5	Styrene	1	<1.0	U	0.61	1.0	2.0
98-82-8	Isopropylbenzene	1	<1.0	U	0.67	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
120-82-1	1,2,4-Trichlorobenzene	1	<1.0	U	0.70	1.0	2.0
541-73-1	1,3-Dichlorobenzene	1	<1.0	U	0.77	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0
95-50-1	1,2-Dichlorobenzene	1	<1.0	U	0.73	1.0	2.0
96-12-8	1,2-Dibromo-3-chloropropane	1	<5.0	U	0.96	5.0	10
87-61-6	1,2,3-Trichlorobenzene	1	<1.0	U	0.86	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	107	85 - 115	
Toluene-d8	50.0	55	109	85 - 120	
4-Bromofluorobenzene	50.0	55	110	75 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1274473	11.48	1457190	11.48	
1,4-Difluorobenzene	1892144	12.06	2274265	12.06	
Chlorobenzene-d5	1672982	14.75	2013436	14.76	
1,4-Dichlorobenzene-d4	818084	17.13	916476	17.15	

* Values outside of QC limits

MM 6/10/13

024

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD11-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-01	File ID:	1f3016.D
Sampled:	05/16/13 08:50	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 16:29
Solids:	42.39	Preparation:	EPA 3550C_MS	Initial/Final:	30.4 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.24	U UJ	0.23	0.24	0.78
108-95-2	Phenol	1	<0.24	U	0.18	0.24	0.78
111-44-4	Bis(2-chloroethyl)ether	1	<0.24	U	0.22	0.24	0.78
95-57-8	2-Chlorophenol	1	<0.24	U	0.19	0.24	0.78
95-48-7	2-Methylphenol	1	<0.24	U	0.17	0.24	0.78
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.24	U	0.19	0.24	0.78
98-86-2	Acetophenone	1	<0.24	U	0.20	0.24	0.78
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.47	U	0.38	0.47	0.78
621-64-7	N-Nitroso-di-n-propylamine	1	<0.24	U	0.21	0.24	0.78
67-72-1	Hexachloroethane	1	<0.24	U	0.17	0.24	0.78
98-95-3	Nitrobenzene	1	<0.24	U	0.19	0.24	0.78
78-59-1	Isophorone	1	<0.24	U	0.17	0.24	0.78
88-75-5	2-Nitrophenol	1	<0.24	U	0.18	0.24	0.78
105-67-9	2,4-Dimethylphenol	1	<0.24	U	0.17	0.24	0.78
111-91-1	Bis(2-chloroethoxy)methane	1	<0.24	U	0.15	0.24	0.78
120-83-2	2,4-Dichlorophenol	1	<0.24	U	0.17	0.24	0.78
106-47-8	4-Chloroaniline	1	<0.24	U	0.22	0.24	0.78
87-68-3	Hexachlorobutadiene	1	<0.24	U	0.19	0.24	0.78
105-60-2	Caprolactam	1	<0.47	U	0.24	0.47	0.78
59-50-7	4-Chloro-3-methylphenol	1	<0.24	U	0.16	0.24	0.78
77-47-4	Hexachlorocyclopentadiene	1	<0.24	U	0.22	0.24	0.78
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.24	U	0.16	0.24	0.78
88-06-2	2,4,6-Trichlorophenol	1	<0.24	U	0.14	0.24	0.78
95-95-4	2,4,5-Trichlorophenol	1	<0.24	U	0.14	0.24	0.78
92-52-4	1,1'-Biphenyl	1	<0.24	U	0.22	0.24	0.78
88-74-4	2-Nitroaniline	1	<0.24	U	0.16	0.24	0.78
131-11-3	Dimethylphthalate	1	<0.24	U	0.15	0.24	0.78
606-20-2	2,6-Dinitrotoluene	1	<0.24	U	0.16	0.24	0.78
99-09-2	3-Nitroaniline	1	<0.24	U	0.17	0.24	0.78
51-28-5	2,4-Dinitrophenol	1	<0.71	UQ	0.28	0.71	0.78
100-02-7	4-Nitrophenol	1	<0.24	UQ	0.19	0.24	0.78
132-64-9	Dibenzofuran	1	<0.24	U	0.16	0.24	0.78
121-14-2	2,4-Dinitrotoluene	1	<0.24	U	0.17	0.24	0.78

% SOL

070713

025

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD11-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-01	File ID:	1f3016.D
Sampled:	05/16/13 08:50	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 16:29
Solids:	42.39	Preparation:	EPA 3550C_MS	Initial/Final:	30.4 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.47	U UJ	0.17	0.47	0.78
84-66-2	Diethylphthalate	1	<0.24	U	0.18	0.24	0.78
7005-72-3	4-Chlorophenyl-phenylether	1	<0.24	U	0.16	0.24	0.78
100-01-6	4-Nitroaniline	1	<0.24	UQ	0.19	0.24	0.78
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.71	U	0.31	0.71	0.78
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.47	U	0.33	0.47	0.78
101-55-3	4-Bromophenyl-phenylether	1	<0.24	U	0.17	0.24	0.78
118-74-1	Hexachlorobenzene	1	<0.24	U	0.19	0.24	0.78
1912-24-9	Atrazine	1	<0.24	U	0.17	0.24	0.78
87-86-5	Pentachlorophenol	1	<0.71	U	0.33	0.71	0.78
86-74-8	Carbazole	1	<0.24	U	0.16	0.24	0.78
84-74-2	Di-n-butylphthalate	1	<0.24	U	0.19	0.24	0.78
85-68-7	Butylbenzylphthalate	1	<0.24	UQ	0.22	0.24	0.78
91-94-1	3,3'-Dichlorobenzidine	1	<0.24	U	0.21	0.24	0.78
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.24	U	0.20	0.24	0.78
117-84-0	Di-n-octylphthalate	1	<0.24	U	0.16	0.24	0.78

7.50L

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	3.88	2.1	53	35 - 105	
Phenol-d5	3.88	2.3	58	40 - 100	
Nitrobenzene-d5	3.88	1.8	47	35 - 100	
2-Fluorobiphenyl	3.88	1.6	40	45 - 105	*
2,4,6-Tribromophenol	3.88	2.0	52	35 - 125	
Terphenyl-d14	3.88	2.7	68	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	355207	6.876	376297	6.946	
Naphthalene-d8	1327117	8.443	1445935	8.527	
Acenaphthene-d10	713011	10.65	860713	10.734	
Phenanthrene-d10	1155945	12.518	1334701	12.61	
Chrysene-d12	856499	16.096	771095	16.217	
Perylene-d12	590531	19.048	620417	19.175	

* Values outside of QC limits

MM 070713

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD11-0H01

Laboratory: ENCO Orlando SDG: A302857-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Matrix: Sediment Laboratory ID: A302857-02 File ID: 1f3017.D

Sampled: 05/16/13 09:00 Prepared: 05/22/13 09:00 Analyzed: 06/03/13 16:58

Solids: 95.14 Preparation: EPA 3550C_MS Initial/Final: 30.4 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.11	U	0.10	0.11	0.35
108-95-2	Phenol	1	<0.11	U	0.080	0.11	0.35
111-44-4	Bis(2-chloroethyl)ether	1	<0.11	U	0.097	0.11	0.35
95-57-8	2-Chlorophenol	1	<0.11	U	0.086	0.11	0.35
95-48-7	2-Methylphenol	1	<0.11	U	0.074	0.11	0.35
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.11	U	0.086	0.11	0.35
98-86-2	Acetophenone	1	<0.11	U	0.087	0.11	0.35
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.21	U	0.17	0.21	0.35
621-64-7	N-Nitroso-di-n-propylamine	1	<0.11	U	0.095	0.11	0.35
67-72-1	Hexachloroethane	1	<0.11	U	0.078	0.11	0.35
98-95-3	Nitrobenzene	1	<0.11	U	0.083	0.11	0.35
78-59-1	Isophorone	1	<0.11	U	0.076	0.11	0.35
88-75-5	2-Nitrophenol	1	<0.11	U	0.082	0.11	0.35
105-67-9	2,4-Dimethylphenol	1	<0.11	U	0.078	0.11	0.35
111-91-1	Bis(2-chloroethoxy)methane	1	<0.11	U	0.067	0.11	0.35
120-83-2	2,4-Dichlorophenol	1	<0.11	U	0.075	0.11	0.35
106-47-8	4-Chloroaniline	1	<0.11	U	0.097	0.11	0.35
87-68-3	Hexachlorobutadiene	1	<0.11	U	0.084	0.11	0.35
105-60-2	Caprolactam	1	<0.21	U	0.11	0.21	0.35
59-50-7	4-Chloro-3-methylphenol	1	<0.11	U	0.070	0.11	0.35
77-47-4	Hexachlorocyclopentadiene	1	<0.11	U	0.098	0.11	0.35
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.11	U	0.073	0.11	0.35
88-06-2	2,4,6-Trichlorophenol	1	<0.11	U	0.063	0.11	0.35
95-95-4	2,4,5-Trichlorophenol	1	<0.11	U	0.061	0.11	0.35
92-52-4	1,1'-Biphenyl	1	<0.11	U	0.10	0.11	0.35
88-74-4	2-Nitroaniline	1	<0.11	U	0.070	0.11	0.35
131-11-3	Dimethylphthalate	1	<0.11	U	0.065	0.11	0.35
606-20-2	2,6-Dinitrotoluene	1	<0.11	U	0.073	0.11	0.35
99-09-2	3-Nitroaniline	1	<0.11	U	0.078	0.11	0.35
51-28-5	2,4-Dinitrophenol	1	<0.32	~~UQ~~ UJ	0.13	0.32	0.35 JCH
100-02-7	4-Nitrophenol	1	<0.11	~~UQ~~ UJ	0.086	0.11	0.35 CCH
132-64-9	Dibenzofuran	1	<0.11	U	0.069	0.11	0.35
121-14-2	2,4-Dinitrotoluene	1	<0.11	~~U~~ UJ	0.076	0.11	0.35 CCH

UM 07/07/13

027

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD11-0H01

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-02	File ID:	1f3017.D
Sampled:	05/16/13 09:00	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 16:58
Solids:	95.14	Preparation:	EPA 3550C_MS	Initial/Final:	30.4 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ	
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.21	U	0.078	0.21	0.35	
84-66-2	Diethylphthalate	1	<0.11	U	0.079	0.11	0.35	
7005-72-3	4-Chlorophenyl-phenylether	1	<0.11	U	0.070	0.11	0.35	
100-01-6	4-Nitroaniline	1	<0.11	~~UQ~~ UJ	0.086	0.11	0.35	CCH
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.32	~~U~~ UJ	0.14	0.32	0.35	ICH
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.21	U	0.15	0.21	0.35	
101-55-3	4-Bromophenyl-phenylether	1	<0.11	U	0.077	0.11	0.35	
118-74-1	Hexachlorobenzene	1	<0.11	U	0.085	0.11	0.35	
1912-24-9	Atrazine	1	<0.11	U	0.078	0.11	0.35	
87-86-5	Pentachlorophenol	1	<0.32	U	0.15	0.32	0.35	
86-74-8	Carbazole	1	<0.11	U	0.071	0.11	0.35	
84-74-2	Di-n-butylphthalate	1	<0.11	U	0.083	0.11	0.35	
85-68-7	Butylbenzylphthalate	1	<0.11	~~UQ~~ UJ	0.098	0.11	0.35	CCH
91-94-1	3,3'-Dichlorobenzidine	1	<0.11	U	0.096	0.11	0.35	
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.11	U	0.089	0.11	0.35	
117-84-0	Di-n-octylphthalate	1	<0.11	U	0.070	0.11	0.35	

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	1.73	1.1	61	35 - 105	
Phenol-d5	1.73	1.2	69	40 - 100	
Nitrobenzene-d5	1.73	1.0	58	35 - 100	
2-Fluorobiphenyl	1.73	0.91	52	45 - 105	
2,4,6-Tribromophenol	1.73	1.1	64	35 - 125	
Terphenyl-d14	1.73	1.6	92	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	350291	6.876	376297	6.946	
Naphthalene-d8	1302953	8.443	1445935	8.527	
Acenaphthene-d10	702833	10.65	860713	10.734	
Phenanthrene-d10	1157083	12.529	1334701	12.61	
Chrysene-d12	742960	16.096	771095	16.217	
Perylene-d12	494893	19.048	620417	19.175	

* Values outside of QC limits

070713

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD10-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-03	File ID:	1f3018.D
Sampled:	05/16/13 09:50	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 17:26
Solids:	52.32	Preparation:	EPA 3550C_MS	Initial/Final:	30.5 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.19	U	0.19	0.19	0.63
108-95-2	Phenol	1	<0.19	U	0.15	0.19	0.63
111-44-4	Bis(2-chloroethyl)ether	1	<0.19	U	0.18	0.19	0.63
95-57-8	2-Chlorophenol	1	<0.19	U	0.16	0.19	0.63
95-48-7	2-Methylphenol	1	<0.19	U	0.13	0.19	0.63
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.19	U	0.16	0.19	0.63
98-86-2	Acetophenone	1	<0.19	U	0.16	0.19	0.63
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.38	U	0.31	0.38	0.63
621-64-7	N-Nitroso-di-n-propylamine	1	<0.19	U	0.17	0.19	0.63
67-72-1	Hexachloroethane	1	<0.19	U	0.14	0.19	0.63
98-95-3	Nitrobenzene	1	<0.19	U	0.15	0.19	0.63
78-59-1	Isophorone	1	<0.19	U	0.14	0.19	0.63
88-75-5	2-Nitrophenol	1	<0.19	U	0.15	0.19	0.63
105-67-9	2,4-Dimethylphenol	1	<0.19	U	0.14	0.19	0.63
111-91-1	Bis(2-chloroethoxy)methane	1	<0.19	U	0.12	0.19	0.63
120-83-2	2,4-Dichlorophenol	1	<0.19	U	0.14	0.19	0.63
106-47-8	4-Chloroaniline	1	<0.19	U	0.18	0.19	0.63
87-68-3	Hexachlorobutadiene	1	<0.19	U	0.15	0.19	0.63
105-60-2	Caprolactam	1	<0.38	U	0.19	0.38	0.63
59-50-7	4-Chloro-3-methylphenol	1	<0.19	U	0.13	0.19	0.63
77-47-4	Hexachlorocyclopentadiene	1	<0.19	U	0.18	0.19	0.63
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.19	U	0.13	0.19	0.63
88-06-2	2,4,6-Trichlorophenol	1	<0.19	U	0.11	0.19	0.63
95-95-4	2,4,5-Trichlorophenol	1	<0.19	U	0.11	0.19	0.63
92-52-4	1,1'-Biphenyl	1	<0.19	U	0.18	0.19	0.63
88-74-4	2-Nitroaniline	1	<0.19	U	0.13	0.19	0.63
131-11-3	Dimethylphthalate	1	<0.19	U	0.12	0.19	0.63
606-20-2	2,6-Dinitrotoluene	1	<0.19	U	0.13	0.19	0.63
99-09-2	3-Nitroaniline	1	<0.19	U	0.14	0.19	0.63
51-28-5	2,4-Dinitrophenol	1	<0.57	~~UQ~~ UJ	0.23	0.57	0.63 ICH
100-02-7	4-Nitrophenol	1	<0.19	~~UQ~~ UJ	0.16	0.19	0.63 CCH
132-64-9	Dibenzofuran	1	<0.19	U	0.13	0.19	0.63
121-14-2	2,4-Dinitrotoluene	1	<0.19	~~U~~ UJ	0.14	0.19	0.63 CCH

VM 070713

029

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD10-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-03	File ID:	1f3018.D
Sampled:	05/16/13 09:50	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 17:26
Solids:	52.32	Preparation:	EPA 3550C_MS	Initial/Final:	30.5 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.38	U	0.14	0.38	0.63
84-66-2	Diethylphthalate	1	<0.19	U	0.14	0.19	0.63
7005-72-3	4-Chlorophenyl-phenylether	1	<0.19	U	0.13	0.19	0.63
100-01-6	4-Nitroaniline	1	<0.19	~~UQ~~ UJ	0.16	0.19	0.63 CCH
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.57	~~U~~ UJ	0.25	0.57	0.63 ICH
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.38	U	0.27	0.38	0.63
101-55-3	4-Bromophenyl-phenylether	1	<0.19	U	0.14	0.19	0.63
118-74-1	Hexachlorobenzene	1	<0.19	U	0.15	0.19	0.63
1912-24-9	Atrazine	1	<0.19	U	0.14	0.19	0.63
87-86-5	Pentachlorophenol	1	<0.57	U	0.27	0.57	0.63
86-74-8	Carbazole	1	<0.19	U	0.13	0.19	0.63
84-74-2	Di-n-butylphthalate	1	<0.19	U	0.15	0.19	0.63
85-68-7	Butylbenzylphthalate	1	<0.19	~~UQ~~ UJ	0.18	0.19	0.63 CCA
91-94-1	3,3'-Dichlorobenzidine	1	<0.19	U	0.17	0.19	0.63
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.19	U	0.16	0.19	0.63
117-84-0	Di-n-octylphthalate	1	<0.19	U	0.13	0.19	0.63

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	3.13	1.5	47	35 - 105	
Phenol-d5	3.13	1.6	52	40 - 100	
Nitrobenzene-d5	3.13	1.3	41	35 - 100	
2-Fluorobiphenyl	3.13	1.0	33	45 - 105	*
2,4,6-Tribromophenol	3.13	1.5	49	35 - 125	
Terphenyl-d14	3.13	2.5	79	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	328393	6.876	376297	6.946	
Naphthalene-d8	1195753	8.443	1445935	8.527	
Acenaphthene-d10	647790	10.65	860713	10.734	
Phenanthrene-d10	1027738	12.518	1334701	12.61	
Chrysene-d12	723019	16.096	771095	16.217	
Perylene-d12	482267	19.048	620417	19.175	

* Values outside of QC limits

WM 070713

030

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD08-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-04	File ID:	1f3019.D
Sampled:	05/16/13 10:15	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 17:55
Solids:	34.66	Preparation:	EPA 3550C_MS	Initial/Final:	30.4 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.29	U UJ	0.29	0.29	0.95
108-95-2	Phenol	1	<0.29	U	0.22	0.29	0.95
111-44-4	Bis(2-chloroethyl)ether	1	<0.29	U	0.27	0.29	0.95
95-57-8	2-Chlorophenol	1	<0.29	U	0.24	0.29	0.95
95-48-7	2-Methylphenol	1	<0.29	U	0.20	0.29	0.95
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.29	U	0.24	0.29	0.95
98-86-2	Acetophenone	1	<0.29	U	0.24	0.29	0.95
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.58	U	0.46	0.58	0.95
621-64-7	N-Nitroso-di-n-propylamine	1	<0.29	U	0.26	0.29	0.95
67-72-1	Hexachloroethane	1	<0.29	U	0.21	0.29	0.95
98-95-3	Nitrobenzene	1	<0.29	U	0.23	0.29	0.95
78-59-1	Isophorone	1	<0.29	U	0.21	0.29	0.95
88-75-5	2-Nitrophenol	1	<0.29	U	0.23	0.29	0.95
105-67-9	2,4-Dimethylphenol	1	<0.29	U	0.21	0.29	0.95
111-91-1	Bis(2-chloroethoxy)methane	1	<0.29	U	0.18	0.29	0.95
120-83-2	2,4-Dichlorophenol	1	<0.29	U	0.20	0.29	0.95
106-47-8	4-Chloroaniline	1	<0.29	U	0.27	0.29	0.95
87-68-3	Hexachlorobutadiene	1	<0.29	U	0.23	0.29	0.95
105-60-2	Caprolactam	1	<0.58	U	0.29	0.58	0.95
59-50-7	4-Chloro-3-methylphenol	1	<0.29	U	0.19	0.29	0.95
77-47-4	Hexachlorocyclopentadiene	1	<0.29	U	0.27	0.29	0.95
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.29	U	0.20	0.29	0.95
88-06-2	2,4,6-Trichlorophenol	1	<0.29	U	0.17	0.29	0.95
95-95-4	2,4,5-Trichlorophenol	1	<0.29	U	0.17	0.29	0.95
92-52-4	1,1'-Biphenyl	1	<0.29	U	0.27	0.29	0.95
88-74-4	2-Nitroaniline	1	<0.29	U	0.19	0.29	0.95
131-11-3	Dimethylphthalate	1	<0.29	U	0.18	0.29	0.95
606-20-2	2,6-Dinitrotoluene	1	<0.29	U	0.20	0.29	0.95
99-09-2	3-Nitroaniline	1	<0.29	U	0.21	0.29	0.95
51-28-5	2,4-Dinitrophenol	1	<0.87	UQ	0.35	0.87	0.95
100-02-7	4-Nitrophenol	1	<0.29	UQ	0.24	0.29	0.95
132-64-9	Dibenzofuran	1	<0.29	U	0.19	0.29	0.95
121-14-2	2,4-Dinitrotoluene	1	<0.29	U	0.21	0.29	0.95

7.50L

VM 070713

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD08-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-04	File ID:	1f3019.D
Sampled:	05/16/13 10:15	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 17:55
Solids:	34.66	Preparation:	EPA 3550C_MS	Initial/Final:	30.4 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.58	U	0.21	0.58	0.95
84-66-2	Diethylphthalate	1	<0.29	U	0.22	0.29	0.95
7005-72-3	4-Chlorophenyl-phenylether	1	<0.29	U	0.19	0.29	0.95
100-01-6	4-Nitroaniline	1	<0.29	UQ	0.24	0.29	0.95
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.87	U	0.38	0.87	0.95
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.58	U	0.40	0.58	0.95
101-55-3	4-Bromophenyl-phenylether	1	<0.29	U	0.21	0.29	0.95
118-74-1	Hexachlorobenzene	1	<0.29	U	0.23	0.29	0.95
1912-24-9	Atrazine	1	<0.29	U	0.21	0.29	0.95
87-86-5	Pentachlorophenol	1	<0.87	U	0.40	0.87	0.95
86-74-8	Carbazole	1	<0.29	U	0.20	0.29	0.95
84-74-2	Di-n-butylphthalate	1	<0.29	U	0.23	0.29	0.95
85-68-7	Butylbenzylphthalate	1	<0.29	UQ	0.27	0.29	0.95
91-94-1	3,3'-Dichlorobenzidine	1	<0.29	U	0.26	0.29	0.95
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.29	U	0.25	0.29	0.95
117-84-0	Di-n-octylphthalate	1	<0.29	U	0.19	0.29	0.95

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	4.74	2.4	50	35 - 105	
Phenol-d5	4.74	2.6	56	40 - 100	
Nitrobenzene-d5	4.74	2.0	42	35 - 100	
2-Fluorobiphenyl	4.74	1.2	25	45 - 105	*
2,4,6-Tribromophenol	4.74	2.0	42	35 - 125	
Terphenyl-d14	4.74	2.3	48	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	385228	6.876	376297	6.946	
Naphthalene-d8	1463228	8.443	1445935	8.527	
Acenaphthene-d10	787823	10.65	860713	10.734	
Phenanthrene-d10	1233751	12.518	1334701	12.61	
Chrysene-d12	899966	16.096	771095	16.217	
Perylene-d12	654720	19.049	620417	19.175	

* Values outside of QC limits

VM 070713

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD09-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-05	File ID:	1f3020.D
Sampled:	05/16/13 10:45	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 18:23
Solids:	42.84	Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.23	U X	0.23	0.23	0.77
108-95-2	Phenol	1	<0.23	U	0.18	0.23	0.77
111-44-4	Bis(2-chloroethyl)ether	1	<0.23	U	0.21	0.23	0.77
95-57-8	2-Chlorophenol	1	<0.23	U	0.19	0.23	0.77
95-48-7	2-Methylphenol	1	<0.23	U	0.16	0.23	0.77
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.23	U	0.19	0.23	0.77
98-86-2	Acetophenone	1	<0.23	U	0.19	0.23	0.77
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.47	U	0.37	0.47	0.77
621-64-7	N-Nitroso-di-n-propylamine	1	<0.23	U	0.21	0.23	0.77
67-72-1	Hexachloroethane	1	<0.23	U	0.17	0.23	0.77
98-95-3	Nitrobenzene	1	<0.23	U	0.18	0.23	0.77
78-59-1	Isophorone	1	<0.23	U	0.17	0.23	0.77
88-75-5	2-Nitrophenol	1	<0.23	U	0.18	0.23	0.77
105-67-9	2,4-Dimethylphenol	1	<0.23	U	0.17	0.23	0.77
111-91-1	Bis(2-chloroethoxy)methane	1	<0.23	U	0.15	0.23	0.77
120-83-2	2,4-Dichlorophenol	1	<0.23	U	0.17	0.23	0.77
106-47-8	4-Chloroaniline	1	<0.23	U	0.21	0.23	0.77
87-68-3	Hexachlorobutadiene	1	<0.23	U	0.19	0.23	0.77
105-60-2	Caprolactam	1	<0.47	U	0.23	0.47	0.77
59-50-7	4-Chloro-3-methylphenol	1	<0.23	U	0.16	0.23	0.77
77-47-4	Hexachlorocyclopentadiene	1	<0.23	U	0.22	0.23	0.77
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.23	U	0.16	0.23	0.77
88-06-2	2,4,6-Trichlorophenol	1	<0.23	U	0.14	0.23	0.77
95-95-4	2,4,5-Trichlorophenol	1	<0.23	U	0.14	0.23	0.77
92-52-4	1,1'-Biphenyl	1	<0.23	U	0.22	0.23	0.77
88-74-4	2-Nitroaniline	1	<0.23	U	0.16	0.23	0.77
131-11-3	Dimethylphthalate	1	<0.23	U	0.14	0.23	0.77
606-20-2	2,6-Dinitrotoluene	1	<0.23	U	0.16	0.23	0.77
99-09-2	3-Nitroaniline	1	<0.23	U	0.17	0.23	0.77
51-28-5	2,4-Dinitrophenol	1	<0.70	UQ	0.28	0.70	0.77
100-02-7	4-Nitrophenol	1	<0.23	UQ	0.19	0.23	0.77
132-64-9	Dibenzofuran	1	<0.23	U	0.15	0.23	0.77
121-14-2	2,4-Dinitrotoluene	1	<0.23	U	0.17	0.23	0.77

RE

VM 070713

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD09-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-05	File ID:	1f3020.D
Sampled:	05/16/13 10:45	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 18:23
Solids:	42.84	Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.47	U X	0.17	0.47	0.77
84-66-2	Diethylphthalate	1	<0.23	U	0.18	0.23	0.77
7005-72-3	4-Chlorophenyl-phenylether	1	<0.23	U	0.16	0.23	0.77
100-01-6	4-Nitroaniline	1	<0.23	UQ	0.19	0.23	0.77
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.70	U	0.30	0.70	0.77
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.47	U	0.33	0.47	0.77
101-55-3	4-Bromophenyl-phenylether	1	<0.23	U	0.17	0.23	0.77
118-74-1	Hexachlorobenzene	1	<0.23	U	0.19	0.23	0.77
1912-24-9	Atrazine	1	<0.23	U	0.17	0.23	0.77
87-86-5	Pentachlorophenol	1	<0.70	U	0.33	0.70	0.77
86-74-8	Carbazole	1	<0.23	U	0.16	0.23	0.77
84-74-2	Di-n-butylphthalate	1	<0.23	U	0.18	0.23	0.77
85-68-7	Butylbenzylphthalate	1	<0.23	UQ	0.22	0.23	0.77
91-94-1	3,3'-Dichlorobenzidine	1	<0.23	U	0.21	0.23	0.77
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.23	U	0.20	0.23	0.77
117-84-0	Di-n-octylphthalate	1	<0.23	U ✓	0.16	0.23	0.77

RE

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	3.89	0.34	9	35 - 105	*
Phenol-d5	3.89	0.39	10	40 - 100	*
Nitrobenzene-d5	3.89	0.18	5	35 - 100	*
2-Fluorobiphenyl	3.89	ND		45 - 105	*
2,4,6-Tribromophenol	3.89	ND		35 - 125	*
Terphenyl-d14	3.89	0.23	6	30 - 125	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	290923	6.876	376297	6.946	
Naphthalene-d8	1013274	8.443	1445935	8.527	
Acenaphthene-d10	518724	10.65	860713	10.734	
Phenanthrene-d10	876861	12.517	1334701	12.61	
Chrysene-d12	711964	16.096	771095	16.217	
Perylene-d12	483345	19.048	620417	19.175	

* Values outside of QC limits

UM 070713

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD09-000H RE

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-05RE1	File ID:	1fe017.D
Sampled:	05/16/13 10:45	Prepared:	06/07/13 09:45	Analyzed:	06/10/13 18:33
Solids:	42.84	Preparation:	EPA 3550C MS	Initial/Final:	30 g / 1 mL

Batch: 3F06021 Sequence: AA24468 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.23	UQ	0.23	0.23	0.77
108-95-2	Phenol	1	<0.23	UQ	0.18	0.23	0.77
111-44-4	Bis(2-chloroethyl)ether	1	<0.23	UQ	0.21	0.23	0.77
95-57-8	2-Chlorophenol	1	<0.23	UQ	0.19	0.23	0.77
95-48-7	2-Methylphenol	1	<0.23	UQ	0.16	0.23	0.77
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.23	UQ	0.19	0.23	0.77
98-86-2	Acetophenone	1	<0.23	UQ	0.19	0.23	0.77
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.47	UQ	0.37	0.47	0.77
621-64-7	N-Nitroso-di-n-propylamine	1	<0.23	UQ	0.21	0.23	0.77
67-72-1	Hexachloroethane	1	<0.23	UQ	0.17	0.23	0.77
98-95-3	Nitrobenzene	1	<0.23	UQ	0.18	0.23	0.77
78-59-1	Isophorone	1	<0.23	UQ	0.17	0.23	0.77
88-75-5	2-Nitrophenol	1	<0.23	UQ	0.18	0.23	0.77
105-67-9	2,4-Dimethylphenol	1	<0.23	UQ	0.17	0.23	0.77
111-91-1	Bis(2-chloroethoxy)methane	1	<0.23	UQ	0.15	0.23	0.77
120-83-2	2,4-Dichlorophenol	1	<0.23	UQ	0.17	0.23	0.77
106-47-8	4-Chloroaniline	1	<0.23	UQ	0.21	0.23	0.77
87-68-3	Hexachlorobutadiene	1	<0.23	UQ	0.19	0.23	0.77
105-60-2	Caprolactam	1	<0.47	UQ	0.23	0.47	0.77
59-50-7	4-Chloro-3-methylphenol	1	<0.23	UQ	0.16	0.23	0.77
77-47-4	Hexachlorocyclopentadiene	1	<0.23	UQ	0.22	0.23	0.77
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.23	UQ	0.16	0.23	0.77
88-06-2	2,4,6-Trichlorophenol	1	<0.23	UQ	0.14	0.23	0.77
95-95-4	2,4,5-Trichlorophenol	1	<0.23	UQ	0.14	0.23	0.77
92-52-4	1,1'-Biphenyl	1	<0.23	UQ	0.22	0.23	0.77
88-74-4	2-Nitroaniline	1	<0.23	UQ	0.16	0.23	0.77
131-11-3	Dimethylphthalate	1	<0.23	UQ	0.14	0.23	0.77
606-20-2	2,6-Dinitrotoluene	1	<0.23	UQ	0.16	0.23	0.77
99-09-2	3-Nitroaniline	1	<0.23	UQ	0.17	0.23	0.77
51-28-5	2,4-Dinitrophenol	1	<0.70	UQ	0.28	0.70	0.77
100-02-7	4-Nitrophenol	1	<0.23	UQ	0.19	0.23	0.77
132-64-9	Dibenzofuran	1	<0.23	UQ	0.15	0.23	0.77
121-14-2	2,4-Dinitrotoluene	1	<0.23	UQ	0.17	0.23	0.77

HT

VM 070713

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-SD09-000H RE

Laboratory:	ENCO Orlando			SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)			Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Sediment	Laboratory ID:	A302857-05RE1	File ID:	1fe017.D
Sampled:	05/16/13 10:45	Prepared:	06/07/13 09:45	Analyzed:	06/10/13 18:33
Solids:	42.84	Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

Batch: 3F06021 Sequence: AA24468 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.47	UQ	0.17	0.47	0.77
84-66-2	Diethylphthalate	1	<0.23	UQ	0.18	0.23	0.77
7005-72-3	4-Chlorophenyl-phenylether	1	<0.23	UQ	0.16	0.23	0.77
100-01-6	4-Nitroaniline	1	<0.23	UQ	0.19	0.23	0.77
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.70	UQ	0.30	0.70	0.77
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.47	UQ	0.33	0.47	0.77
101-55-3	4-Bromophenyl-phenylether	1	<0.23	UQ	0.17	0.23	0.77
118-74-1	Hexachlorobenzene	1	<0.23	UQ	0.19	0.23	0.77
1912-24-9	Atrazine	1	<0.23	UQ	0.17	0.23	0.77
87-86-5	Pentachlorophenol	1	<0.70	UQ	0.33	0.70	0.77
86-74-8	Carbazole	1	<0.23	UQ	0.16	0.23	0.77
84-74-2	Di-n-butylphthalate	1	<0.23	UQ	0.18	0.23	0.77
85-68-7	Butylbenzylphthalate	1	<0.23	UQ	0.22	0.23	0.77
91-94-1	3,3'-Dichlorobenzidine	1	<0.23	UQ	0.21	0.23	0.77
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.23	UQ	0.20	0.23	0.77
117-84-0	Di-n-octylphthalate	1	<0.23	UQ	0.16	0.23	0.77

HT

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	3.89	2.2	57	35 - 105	
Phenol-d5	3.89	2.5	65	40 - 100	
Nitrobenzene-d5	3.89	1.7	44	35 - 100	
2-Fluorobiphenyl	3.89	0.48	12	45 - 105	*
2,4,6-Tribromophenol	3.89	1.6	41	35 - 125	
Terphenyl-d14	3.89	1.1	28	30 - 125	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	302806	6.786	376297	6.946	
Naphthalene-d8	1209823	8.36	1445935	8.527	
Acenaphthene-d10	685308	10.557	860713	10.734	
Phenanthrene-d10	1147130	12.437	1334701	12.61	
Chrysene-d12	722026	15.964	771095	16.217	
Perylene-d12	519552	18.896	620417	19.175	

* Values outside of QC limits

LM 070713

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-EB01-051613-SD

Laboratory: ENCO Orlando SDG: A302857-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Matrix: Water Laboratory ID: A302857-07 File ID: 1f5009.D

Sampled: 05/16/13 06:45 Prepared: 05/22/13 01:30 Analyzed: 06/05/13 14:34

Solids: Preparation: EPA 3510C_MS Initial/Final: 500 mL / 0.5 mL

Batch: 3E22001 Sequence: AA24423 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<6.0	~~UQ~~	5.4	6.0	10
108-95-2	Phenol	1	<3.0	U	1.4	3.0	10
111-44-4	Bis(2-chloroethyl)ether	1	<6.0	U	3.2	6.0	10
95-57-8	2-Chlorophenol	1	<6.0	U	2.8	6.0	10
95-48-7	2-Methylphenol	1	<3.0	U	2.3	3.0	10
108-60-1	Bis(2-chloroisopropyl)ether	1	<6.0	U	3.1	6.0	10
98-86-2	Acetophenone	1	<3.0	U	3.0	3.0	10
108-39-4/106-44-5	3 & 4-Methylphenol	1	<6.0	U	4.5	6.0	10
621-64-7	N-Nitroso-di-n-propylamine	1	<6.0	U	3.4	6.0	10
67-72-1	Hexachloroethane	1	<3.0	U	2.9	3.0	10
98-95-3	Nitrobenzene	1	<6.0	U	3.1	6.0	10
78-59-1	Isophorone	1	<3.0	U	2.9	3.0	10
88-75-5	2-Nitrophenol	1	<6.0	U	3.1	6.0	10
105-67-9	2,4-Dimethylphenol	1	<6.0	U	2.7	6.0	10
111-91-1	Bis(2-chloroethoxy)methane	1	<6.0	U	2.7	6.0	10
120-83-2	2,4-Dichlorophenol	1	<6.0	U	3.3	6.0	10
106-47-8	4-Chloroaniline	1	<6.0	U	2.7	6.0	10
87-68-3	Hexachlorobutadiene	1	<6.0	U	3.6	6.0	10
105-60-2	Caprolactam	1	<3.0	U	2.7	3.0	10
59-50-7	4-Chloro-3-methylphenol	1	<6.0	U	2.6	6.0	10
77-47-4	Hexachlorocyclopentadiene	1	<6.0	U	3.8	6.0	10
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<6.0	U	3.2	6.0	10
88-06-2	2,4,6-Trichlorophenol	1	<6.0	U	3.7	6.0	10
95-95-4	2,4,5-Trichlorophenol	1	<6.0	U	3.6	6.0	10
92-52-4	1,1'-Biphenyl	1	<9.0	U	7.0	9.0	10
88-74-4	2-Nitroaniline	1	<3.0	U	2.8	3.0	10
131-11-3	Dimethylphthalate	1	<3.0	U	2.9	3.0	10
606-20-2	2,6-Dinitrotoluene	1	<3.0	U	2.7	3.0	10
99-09-2	3-Nitroaniline	1	<3.0	U	2.8	3.0	10
51-28-5	2,4-Dinitrophenol	1	<6.0	~~U~~ UJ	5.2	6.0	10 ICH
100-02-7	4-Nitrophenol	1	<3.0	~~UQ~~	2.3	3.0	10
132-64-9	Dibenzofuran	1	<3.0	U	2.8	3.0	10
121-14-2	2,4-Dinitrotoluene	1	<6.0	U	2.8	6.0	10

MA 07/13

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

Veno-EB01-051613-SD

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302857-07	File ID:	1f5009.D
Sampled:	05/16/13 06:45	Prepared:	05/22/13 01:30	Analyzed:	06/05/13 14:34
Solids:		Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

Batch: 3E22001 Sequence: AA24423 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<6.0	~~UQ~~	4.7	6.0	10
84-66-2	Diethylphthalate	1	<3.0	U	3.0	3.0	10
7005-72-3	4-Chlorophenyl-phenylether	1	<6.0	U	3.2	6.0	10
100-01-6	4-Nitroaniline	1	<3.0	~~U~~ UJ	2.7	3.0	10 CCH
534-52-1	2-Methyl-4,6-dinitrophenol	1	<6.0	~~U~~ UJ	6.0	6.0	10 ICH
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<6.0	U	5.4	6.0	10
101-55-3	4-Bromophenyl-phenylether	1	<6.0	U	3.3	6.0	10
118-74-1	Hexachlorobenzene	1	<3.0	U	3.0	3.0	10
1912-24-9	Atrazine	1	<3.0	~~UQ~~	2.9	3.0	10
87-86-5	Pentachlorophenol	1	<9.0	U	6.3	9.0	10
86-74-8	Carbazole	1	<3.0	U	2.5	3.0	10
84-74-2	Di-n-butylphthalate	1	<3.0	U	2.7	3.0	10
85-68-7	Butylbenzylphthalate	1	<3.0	U	2.8	3.0	10
91-94-1	3,3'-Dichlorobenzidine	1	<6.0	U	3.2	6.0	10
117-81-7	Bis(2-ethylhexyl)phthalate	1	<6.0	U	3.5	6.0	10
117-84-0	Di-n-octylphthalate	1	<6.0	U	3.4	6.0	10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	50.0	28	56	20 - 110	
Phenol-d5	50.0	20	40	10 - 115	
Nitrobenzene-d5	50.0	43	87	40 - 110	
2-Fluorobiphenyl	50.0	39	78	50 - 110	
2,4,6-Tribromophenol	50.0	47	93	40 - 125	
Terphenyl-d14	50.0	64	128	50 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	299206	6.846	376297	6.946	
Naphthalene-d8	1110688	8.415	1445935	8.527	
Acenaphthene-d10	614536	10.622	860713	10.734	
Phenanthrene-d10	1048084	12.494	1334701	12.61	
Chrysene-d12	751158	16.041	771095	16.217	
Perylene-d12	523200	18.989	620417	19.175	

* Values outside of QC limits

LM 070713

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD11-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-01	File ID:	2F4035.D
Sampled:	05/16/13 08:50	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 16:59
Solids:	42.39	Preparation:	EPA 3550C	Initial/Final:	30 g / 10 mL

Batch:	3E21001	Sequence:	AA24376	Calibration:	1304047	Instrument:	OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	<0.0047	UJ ~~UD~~ SSL	0.0025	0.0047	0.0080
72-54-8	4,4'-DDD	2	<0.0047	~~UD~~	0.0023	0.0047	0.0080
50-29-3	4,4'-DDT	2	<0.0047	~~UD~~	0.0031	0.0047	0.0080

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0786	0.019	24	70 - 125	✓
2,4,5,6-TCMX [2C]	0.0786	0.019	24	70 - 125	✓
Decachlorobiphenyl	0.0786	0.053	67	55 - 130	
Decachlorobiphenyl [2C]	0.0786	0.046	58	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	592500000	5.481	3.764E+08	5.31	
DBC [2C]	394500000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC
7/11/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD11-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1. CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-01RE1	File ID:	2FB022.D
Sampled:	05/16/13 08:50	Prepared:	06/06/13 12:45	Analyzed:	06/07/13 14:48
Solids:	42.39	Preparation:	EPA 3550C	Initial/Final:	30 g / 10 mL

Batch: 3F06020 Sequence: AA24452 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	<0.0024	~~UQ~~	0.0012	0.0024	0.0040 exclude
72-54-8	4,4'-DDD	1	<0.0024	~~UQ~~	0.0011	0.0024	0.0040
50-29-3	4,4'-DDT	1	<0.0024	~~UQ~~	0.0016	0.0024	0.0040

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0786	0.0033	4	70 - 125	*
2,4,5,6-TCMX [2C]	0.0786	0.0028	3	70 - 125	*
Decachlorobiphenyl	0.0786	0.0061	8	55 - 130	*
Decachlorobiphenyl [2C]	0.0786	0.0047	6	55 - 130	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	635200000	5.459	3.764E+08	5.31	
DBC [2C]	373800000	5.359	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/11/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD11-0H01

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill. Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1. CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-02	File ID:	2F4036.D
Sampled:	05/16/13 09:00	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 17:11
Solids:	95.14	Preparation:	EPA 3550C	Initial/Final:	30.1 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	0.0015	J ~~JD~~ SSL	0.0011	0.0021	0.0036
72-54-8	4,4'-DDD	2	<0.0021	UJ ~~UD~~	0.0010	0.0021	0.0036
50-29-3	4,4'-DDT	2	<0.0021	UJ ~~UD~~	0.0014	0.0021	0.0036

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0349	0.012	34	70 - 125	*
2,4,5,6-TCMX [2C]	0.0349	0.011	31	70 - 125	*
Decachlorobiphenyl	0.0349	0.022	62	55 - 130	
Decachlorobiphenyl [2C]	0.0349	0.018	52	55 - 130	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	565900000	5.482	3.764E+08	5.31	
DBC [2C]	388400000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC
7/1/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD10-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-03	File ID:	2F4037.D
Sampled:	05/16/13 09:50	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 17:23
Solids:	52.32	Preparation:	EPA 3550C	Initial/Final:	30.2 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	<0.0038	UJ UD SSL	0.0020	0.0038	0.0065
72-54-8	4,4'-DDD	2	<0.0038	UD	0.0018	0.0038	0.0065
50-29-3	4,4'-DDT	2	<0.0038	UD	0.0025	0.0038	0.0065

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0633	0.040	64	70 - 125	*
2,4,5,6-TCMX [2C]	0.0633	0.035	55	70 - 125	*
Decachlorobiphenyl	0.0633	0.043	67	55 - 130	
Decachlorobiphenyl [2C]	0.0633	0.035	55	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	548000000	5.482	3.764E+08	5.31	
DBC [2C]	372400000	5.389	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/1/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD08-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-04	File ID:	2F4038.D
Sampled:	05/16/13 10:15	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 17:35
Solids:	34.66	Preparation:	EPA 3550C	Initial/Final:	30.2 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	<0.0058	~~UD~~ WJ SSL	0.0030	0.0058	0.0098
72-54-8	4,4'-DDD	2	<0.0058	~~UD~~	0.0028	0.0058	0.0098
50-29-3	4,4'-DDT	2	<0.0058	~~UD~~	0.0038	0.0058	0.0098

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0955	0.055	57	70 - 125	*
2,4,5,6-TCMX [2C]	0.0955	0.051	54	70 - 125	*
Decachlorobiphenyl	0.0955	0.068	71	55 - 130	
Decachlorobiphenyl [2C]	0.0955	0.056	58	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	505500000	5.482	3.764E+08	5.31	
DBC [2C]	337200000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/1/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-SD09-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-05	File ID:	2F4039.D
Sampled:	05/16/13 10:45	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 17:47
Solids:	42.84	Preparation:	EPA 3550C	Initial/Final:	30.3 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	<0.0047	~~UD~~ SSL	0.0024	0.0047	0.0079
72-54-8	4,4'-DDD	2	<0.0047	~~UD~~	0.0022	0.0047	0.0079
50-29-3	4,4'-DDT	2	<0.0047	~~UD~~	0.0031	0.0047	0.0079

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0770	0.053	69	70 - 125	*
2,4,5,6-TCMX [2C]	0.0770	0.047	62	70 - 125	*
Decachlorobiphenyl	0.0770	0.052	68	55 - 130	
Decachlorobiphenyl [2C]	0.0770	0.043	56	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	537700000	5.482	3.764E+08	5.31	
DBC [2C]	353700000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JC 7/1/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

Veno-EB01-051613-SD

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302857-07	File ID:	2F4021.D
Sampled:	05/16/13 06:45	Prepared:	05/20/13 13:30	Analyzed:	06/04/13 14:09
Solids:		Preparation:	EPA 3510C	Initial/Final:	500 mL / 5 mL

Batch: 3E20028 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	<0.050	U	0.023	0.050	0.10
72-54-8	4,4'-DDD	1	<0.050	U	0.023	0.050	0.10
50-29-3	4,4'-DDT	1	<0.050	UJ/CCL	0.024	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.79	79	25 - 140	
2,4,5,6-TCMX [2C]	1.00	0.72	72	25 - 140	
Decachlorobiphenyl	1.00	0.78	78	30 - 135	
Decachlorobiphenyl [2C]	1.00	0.69	69	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	529200000	5.483	3.764E+08	5.31	
DBC [2C]	337600000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/1/13

PROJECT NARRATIVE

Client: CH2M Hill, Inc.
Project: East Vieques La Chiva SWMU 1, CTO-0037
Project Number: 408040
ENCO Project ID: A302857
SDG: A302857-CTO0037

Overview

All samples submitted were analyzed by Environmental Conservation Laboratories, Inc. in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling and processing will be discussed in the Remarks section below.

Remarks

Analytical and Preparation Method/ SOP Reference	Instrument
EPA 8260B	OVGCMS2/ OVGCMS3
EPA 8270D	OSVGCMS1
EPA 8081B	OSVGCECD2
EPA 9045D	OWETSPH1
Walkley Black	Titration

Analysis: EPA 8260B
Sequence: AA2766
Affected Sample(s): AA22766-ICB1, AA22766-CAL1, AA22766-CAL2, AA22766-CAL3, AA22766-CAL4, AA22766-CAL5, AA22766-CAL6, AA22766-SCV1, AA22766-SCV2
Nonconformance: Manual integrations
Additional Information: The following manual integrations were performed in the sample(s) AA22766-ICB1, AA22766-CAL6 due to ISTD reintegration: 1,4- Difluorobenzene.
The following manual integrations were performed in the sample(s) AA22766-CAL1 due to ISTD reintegration: Pentafluorobenzene, 1,4- Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) AA22766-CAL1 due to poor integration (peak tailing, baseline selection): Methyl Cyclohexane, Carbon Tetrachloride, Benzene, 1,2-Dichloropropane, 1,4-Dioxane, 2-Chloroethyl vinyl ether, 1,1,2,2-Tetrachloroethane.
The following manual integrations were performed in the sample(s) AA22766-CAL1 due to incorrect peak selection/peak not found: 1,4-Dioxane.
The following manual integrations were performed in the sample(s) AA22766-CAL2 due to poor integration (peak tailing, baseline selection): Chloroethane, Acetone, Carbon Tetrachloride, 2-Chloroethyl vinyl ether, CHlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA22766-CAL2 due to ISTD reintegration: Chlorobenzene-d5, 1,4- Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) AA22766-CAL3 due to poor integration (peak tailing, baseline selection): Bromomethane, 1,2-Dichloroethane, 2-Chloroethyl vinyl ether, Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA22766-CAL3 due to ISTD reintegration: Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA22766-CAL4 due to poor integration (peak tailing, baseline selection): Bromomethane, Chloroethane, Methyl tert-butyl ether, 1,4-Dichlorobenzene-d4, 2-Chloroethyl vinyl ether.
The following manual integrations were performed in the sample(s) AA22766-CAL5, AA22766-SCV2 due to ISTD reintegration: Pentafluorobenzene.

PROJECT NARRATIVE

The following manual integrations were performed in the sample(s) AA22766-CAL5 due to poor integration (peak tailing, baseline selection): 2-Chloroethyl vinyl ether.
The following manual integrations were performed in the sample(s) AA22766-CAL6 due to poor integration (peak tailing, baseline selection): Acetone, 2-Butanone.
The following manual integrations were performed in the sample(s) AA22766-SCV1 due to ISTD reintegration: Pentafluorobenzene, 1,4-Difluorobenzene.
The following manual integrations were performed in the sample(s) AA22766-SCV1 due to poor integration (peak tailing, baseline selection): Bromofluorobenzene.
The following manual integrations were performed in the sample(s) AA22766-SCV2 due to poor integration (peak tailing, baseline selection): Isobutyl Alcohol, Bromofluorobenzene.

Analysis: EPA 8260B
Sequence: AA23761
Affected Sample(s): AA23761-CAL1, AA23761-CAL2, AA23761-CAL3, AA23761-CAL6, AA23761-CAL7, AA23761-SCV1, AA23761-SCV2
Nonconformance: Manual integrations
Additional Information: The following manual integrations were performed in the sample(s) AA23761-CAL1 due to ISTD reintegration: Pentafluorobenzene, 1,4- Difluorobenzene, Chlorobenzene-d5, 1,4-Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) AA23761-CAL2 due to poor integration (peak tailing, baseline selection): Acrolein, Acetone, Chloropropene, Cyclohexane, Methyl Cyclohexane, Methyl Methacrylate, 4-Methyl-2-Pentaone, 2-Chloroethyl vinyl ether.
The following manual integrations were performed in the sample(s) AA23761-CAL2 due to ISTD reintegration and baseline drop for split peaks: Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA23761-CAL2 due to ISTD reintegration and poor integration (peak tailing, baseline selection): 1,4-Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) AA23761-CAL3 due to poor integration (peak tailing, baseline selection): Acrolein, 2-Chloroethyl vinyl ether, Naphthalene.
The following manual integrations were performed in the sample(s) AA23761-CAL6 due to poor integration (peak tailing, baseline selection): Chloroethane.
The following manual integrations were performed in the sample(s) AA23761-CAL7 due to poor integration (peak tailing, baseline selection): Acetone.
The following manual integrations were performed in the sample(s) AA23761-SCV1 due to ISTD reintegration: Pentafluorobenzene, 1,4- Difluorobenzene.
The following manual integrations were performed in the sample(s) AA23761-SCV2 due to ISTD reintegration: Pentafluorobenzene, 1,4- Difluorobenzene, Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA23761-SCV2 due to poor integration (peak tailing, baseline selection): Naphthalene.

Analysis: EPA 8260B
Sequence: AA24249
Affected Sample(s): AA24249-CCV1, 3E21023-BS1, 3E21023-MS1, 3E21023-MSD1
Nonconformance: Manual integrations
Additional Information: The following manual integrations were performed in the sample(s) AA24249-CCV1, 3E21023-BS1 due to ISTD reintegration: Pentafluorobenzene.
The following manual integrations were performed in the sample(s) AA24249-CCV1 due to incorrect peak selection/peak not found: 2-Chloroethyl vinyl ether.
The following manual integrations were performed in the sample(s) 3E21023-MS1 due to ISTD reintegration and poor integration (peak tailing, baseline selection): Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) 3E21023-MS1 due to incorrect peak selection/peak not found: 1,4-Dioxane.
The following manual integrations were performed in the sample(s) 3E21023-MS1 due to ISTD reintegration, poor integration (peak tailing, baseline selection), and hump integration: Chlorobenzene-d5

Analysis: EPA 8260B
Sequence: AA24312
Affected Sample(s): AA24312-CCV1, 3E24030-BS1, 3E24030-BSD1
Nonconformance: Manual integrations
Additional Information: The following manual integrations were performed in the sample(s) AA24312-CCV1 due to ISTD reintegration: Pentafluorobenzene, 1,4-Difluorobenzene, Chlorobenzene-d5, 1,4-

Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) 3E24030-BS1 due to incorrect peak selection/peak not found: 1,4-Dioxane.
The following manual integrations were performed in the sample(s) 3E24030-BS1, 3E24030-BSD1 due to ISTD reintegration: Pentafluorobenzene.

Analysis:EPA8081B
Sequence:AA23829
Affected Samples: AA23829-CAL1, AA23829-CAL2
Nonconformance:Manual Integrations
Additional Information: The following manual integrations were performed in the sample(s) AA23829-CAL1, AA23829-CAL 2 due to incorrect peak selection/peak not found: Mirex.

Analysis:EPA8081B
Sequence:AA24376
Affected Samples: AA24376-PEM1, AA24376-CCV1
Nonconformance:Manual Integrations
Additional Information: The following manual integrations were performed in the sample(s) AA24376-PEM1 due to poor integration (peak tailing, baseline selection): 4,4'-DDD.
The following manual integrations were performed in the sample(s) AA24376-CCV1 due to ISTD reintegration: DBC.

Analysis:EPA 8260B
Affected Samples: Veno-SD11-000H [A302857-01], Veno-SD09-000H [A302857-05]
Nonconformance: The surrogate recovery was outside acceptance limits for 4-Bromoflurobenzene.

Analysis:EPA 8081B
Affected Samples: Veno-SD11-000H [A302857-01], Veno-SD11-000H [A302857-01RE1]
Nonconformance: The sample was analyzed at a dilution due to suspected matrix interference (dark, opaque extract). The surrogate recovery was outside acceptance limits for 2,4,5,6-TCMX. The client was informed of the failing surrogate recoveries and matrix issues with the samples. The sample was re-extracted and re-analyzed for confirmation at a lower dilution. The sample was re-extracted outside of acceptable holding time. The surrogate recoveries for 2,4,5,6-TCMX and Decachlorobiphenyl were outside acceptance limits. This is a confirmed matrix effect.

Analysis:EPA 8081B
Affected Samples: Veno-SD11-0H01 [A302857-02], Veno-SD10-000H [A302857-03], Veno-SD08-000H [A302857-04], Veno-SD09-000H [A302857-05]
Nonconformance: The sample was analyzed at a dilution due to suspected matrix interference (dark, opaque extract). The surrogate recovery was outside acceptance limits for 2,4,5,6-TCMX. The client was informed of the failing surrogate recoveries and matrix issues with the samples.

Analysis:EPA 8081B
Affected Samples: 3E21001-BLK1
Nonconformance: The surrogate recoveries were outside acceptance limits for 2,4,5,6-TCMX and Decachlorobiphenyl.

Analysis:EPA 8270D
Affected Samples: AA24398-CCV1, Veno-SD11-000h [A302857-01], Veno-SD11-0H01 [A302857-02], Veno-SE10-000H [A302857-03], Veno-SD08-000H [A302857-04], Veno-SD09-000H [A302857-05]
Nonconformance: The associated continuing calibration verification standard exhibited high bias for 2,4-Dinitrophenol, 4-Nitroaniline, and 4-Nitrophenol; since the result is ND, the impact on data quality is minimal.

Analysis:EPA 8270D
Affected Samples: 3E22007-BS1, Veno-SD11-000h [A302857-01], Veno-SD11-0H01 [A302857-02], Veno-SE10-000H [A302857-03], Veno-SD08-000H [A302857-04], Veno-SD09-000H [A302857-05]
Nonconformance: The associated laboratory control sample exhibited high bias for Butylbenzylphthalate; since the result is ND, the impact on data quality is minimal.

PROJECT NARRATIVE

Analysis:EPA 8270D
Affected Samples: Veno-SD11-000h [A302857-01], Veno-SE10-000H [A302857-03], Veno-SD08-000H [A302857-04]
Nonconformance: Surrogate recovery biased low and outside control limits due to suspected matrix effects for 2-Fluorobiphenyl, as evidenced by sample behavior during sample preparation (emulsion formation, excessive foaming). The client was informed of the low surrogate recoveries.

Analysis:EPA 8270D
Affected Samples: Veno-SD09-000H [A302857-05], Veno-SD09-000H [A302857-05RE1]
Nonconformance: Surrogate recovery biased low and outside control limits due to suspected matrix effects for 2,4,6-Tribromophenol, 2-Fluorobiphenyl, 2-Fluorophenol, Nitrobenzene-d5, Phenol-d5, and T, as evidenced by sample behavior during sample preparation (emulsion formation, excessive foaming). The client was informed of the low surrogate recoveries. The sample was re-extracted and re-analyzed for confirmation. The sample was re-extracted outside of acceptable holding time. The surrogate recoveries were outside acceptance limits for 2-Fluorobiphenyl and Terphenyl-d14. This is a confirmed matrix effect.

Analysis:EPA 8270D
Affected Samples: AA24468-CCV1, Veno-SD09-000H [A302857-05RE1]
Nonconformance: The associated continuing calibration verification standard exhibited high bias for 4-Nitroaniline and 4-Nitrophenol; since the result is ND, the impact on data quality is minimal.

Analysis:EPA 8270D
Affected Samples: 3F06021-BS1, 3F06021-BSD1, Veno-SD09-000H [A302857-05RE1]
Nonconformance: The associated laboratory control sample exhibited high bias for 1,2,4,5-Tetrachlorobenzene, Acetophenone; since the result is ND, the impact on data quality is minimal.

Analysis:EPA 8270D
Affected Samples: AA24423-CCV1, Veno-EB01-051613-SD [A302857-07]
Nonconformance: The associated continuing calibration verification standard exhibited high bias for 4-Nitrophenol; since the result is ND, the impact on data quality is minimal.

Analysis:EPA 8270D
Affected Samples: 3E22001-BS1, 3E22001-BSD1, Veno-EB01-051613-SD [A302857-07]
Nonconformance: The associated laboratory control sample exhibited high bias for 2,3,4,6-Tetrachlorobenzene, Atrazine, and Benzaldehyde; since the result is ND, the impact on data quality is minimal.

Analysis: EPA 9045D
Affected Samples: Veno-SD11-000h [A302857-01], Veno-SD11-0H01 [A302857-02], Veno-SE10-000H [A302857-03], Veno-SD08-000H [A302857-04], Veno-SD09-000H [A302857-05]
Nonconformance: Samples were received into the laboratory outside acceptable holding time. The results are reported as qualified out of hold.

Subcontracted Analysis
Subcontracted analysis will be submitted under separate report. A summary of subcontracted analysis and samples is outlined below.
Analysis: ASTM D422
Samples: Veno-SD11-000h [A302857-01], Veno-SD11-0H01 [A302857-02], Veno-SE10-000H [A302857-03], Veno-SD08-000H [A302857-04], Veno-SD09-000H [A302857-05]

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PROJECT NARRATIVE

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy package and in computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures.

Digitally signed by Marcia Colon
Reason: I am the author of this document
Date: 2013.06.12 10:50:55 -04'00'

Marcia Colon
June 12, 2013

Project Manager

Environmental
Conservation Labs, Inc.
10775 Central Port Drive
Orlando, FL 32824

phone: (407) 826-5314

ELECTRONIC CHAIN OF CUSTODY RECORD

C.O.C. 20130516-LeChevaLagoon-ENCO-01

Report to: PLEASE PRINT
Company Name: CH2MHILL
Address: 15010 Conference Dr. ; 200
Chantilly, VA 20151
Attn: Mike Zamboni
Phone: 703.376.5301
Fax: 703.376.5801

Invoice to: PLEASE PRINT
Company Name: See Contact
Address:
Attn:
Phone:
Fax:

Project Name/Number: Terrestrial UXO Site Sampling/424191.FLFK.04
Purchase Order Number: 948828
Sampler (Print): not required
Sampler (Signature): not required
Date Shipped: 5/15/13
Carrier: FedEx
Waybill No.: ~~790765047488~~
Comments: ~~749 7 7 8 0 7 66~~

Sample Identification	Location	Date Collected	Time Collected	Time Zone	No. of Containers	Matrix: Aq	Matrix: Sed.	Matrix: Soil	Matrix: ✓	Analysis Requested/Method Number: [illegible]	[illegible]	[illegible]	[illegible]	TOC	ASTM D422							
VENO-SD11-000H		5/16/13	08:50	AST	5		✓			X	X	X	X	X	X							~~airbill(2) 789767223857~~
VENO-SD11-0H01		5/16/13	09:00	AST	5		✓			X	X	X	X	X	X							
VENO-SD10-000H		5/16/13	09:50	AST	5		✓			X	X	X	X	X	X							
VENO-SD08-000H		5/16/13	10:15	AST	5		✓			X	X	X	X	X	X							
VENO-SD09-000H		5/16/13	10:45	AST	5		✓			X	X	X	X	X	X							
VENO-TB01-051613		5/16/13	11:50	AST	2	✓				X												
VENO-EB01-051613		5/16/13	06:45	AST	5	✓				X	X	X										
									✓													
									✓													
									✓													
									✓													

Shuttle Temperature:
Turnaround Requested: Check one ☑ Stan 28 days ☐ One week ☐ 24/48 Hrs. ☐ Other
Sample Disposal: ~~☐ Return to client~~ ~~☐ Disposal by Lab (30 day retention)~~ not applicable

Relinquished by sampler:	Date: 5/16/13	Time: 1235	Received by:	Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date: 9:25	Time: 5/17/13	Received at lab by:

White: Return to client with report Yellow: Laboratory Copy Pink: Sampler

Note: The first sampled date of the ARF will be used as the COC number unless indicated otherwise.

MB-99 5C

051

WORK ORDER

Printed: 5/20/2013 11:27:06AM

A302857

ENCO Orlando

Client:	**CH2M Hill, Inc. (CH029)**	**Lab Project Mgr:**	**Marcia Colon**
Project:	**East Vieques La Chiva SWMU 1, CTO-0037**	**Project Number:**	**408040**
PO #:	**948828**		

Report To:
CH2M Hill, Inc. (CH029)
Michael Zamboni
15010 Conference Center Drive, Suite 200
Chantilly, VA 20151
Phone: (703) 376-5301
Fax:

Invoice To:
CH2M Hill, Inc. (CH029)
Accounts Payable
PO Box 241329
Denver, CO 80224
Phone :(703) 376-5301
Fax:

Client Notes

Project Notes

Work Order Notes

NOTE: These are International Samples from Puerto Rico. JFF 5/17/13

Date Due:	07-Jun-13 17:00 (14 day TAT)		
Received By:	Joanne Fournier	Date Received:	17-May-13 09:25
Logged In By:	Joanne Fournier	Date Logged In:	17-May-13 15:30

Cooler: MB-99 received at 5.0°C

Containers Intact	Y	Containers Properly Preserved	Y	Proper Containers Received	Y	COC/Labels Agree	Y	Custody Seals Intact	Y
Volatile Containers Preserved	Y	Volatile Containers Headspace Free	Y	Aqueous Samples Checked for Residual Cl	N	All Samples in PreLog Received	N	Received On Ice	Y

Analysis	Due	TAT	Expires	Status	Comments
A302857-01 Veno-SD11-000H [Soil] Sampled 16-May-13 08:50 Eastern					
8081B DOD	24-May-13 15:00	5	30-May-13 08:50	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	24-May-13 15:00	5	30-May-13 08:50	Received	
8270D TCL SOM01.2 DOD	24-May-13 15:00	5	30-May-13 08:50	Received	
pH 9045D DOD	24-May-13 15:00	5	16-May-13 09:04	Received	
Solids, Dry Weight	24-May-13 15:00	5	12-Nov-13 08:50	Available	
TOC Walkley Black DOD	24-May-13 15:00	5	15-Jun-13 08:50	Received	

A302857

ENCO Orlando

Client:	CH2M Hill, Inc. (CH029)	Lab Project Mgr:	Marcia Colon
Project:	East Vieques La Chiva SWMU 1, CTO-0037	Project Number:	408040
PO #:	948828		

Analysis	Due	TAT	Expires	Status	Comments
A302857-02 Veno-SD11-0H01 [Soil] Sampled 16-May-13 09:00 Eastern					
8081B DOD	24-May-13 15:00	5	30-May-13 09:00	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	24-May-13 15:00	5	30-May-13 09:00	Received	
8270D TCL SOM01.2 DOD	24-May-13 15:00	5	30-May-13 09:00	Received	
pH 9045D DOD	24-May-13 15:00	5	16-May-13 09:14	Received	
Solids, Dry Weight	24-May-13 15:00	5	12-Nov-13 09:00	Available	
TOC Walkley Black DOD	24-May-13 15:00	5	15-Jun-13 09:00	Received	
A302857-03 Veno-SD10-000H [Soil] Sampled 16-May-13 09:50 Eastern					
8081B DOD	24-May-13 15:00	5	30-May-13 09:50	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	24-May-13 15:00	5	30-May-13 09:50	Received	
8270D TCL SOM01.2 DOD	24-May-13 15:00	5	30-May-13 09:50	Received	
pH 9045D DOD	24-May-13 15:00	5	16-May-13 10:04	Received	
Solids, Dry Weight	24-May-13 15:00	5	12-Nov-13 09:50	Available	
TOC Walkley Black DOD	24-May-13 15:00	5	15-Jun-13 09:50	Received	
A302857-04 Veno-SD08-000H [Soil] Sampled 16-May-13 10:15 Eastern					
8081B DOD	24-May-13 15:00	5	30-May-13 10:15	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	24-May-13 15:00	5	30-May-13 10:15	Received	
8270D TCL SOM01.2 DOD	24-May-13 15:00	5	30-May-13 10:15	Received	
pH 9045D DOD	24-May-13 15:00	5	16-May-13 10:29	Received	
Solids, Dry Weight	24-May-13 15:00	5	12-Nov-13 10:15	Available	
TOC Walkley Black DOD	24-May-13 15:00	5	15-Jun-13 10:15	Received	
A302857-05 Veno-SD09-000H [Soil] Sampled 16-May-13 10:45 Eastern					
8081B DOD	24-May-13 15:00	5	30-May-13 10:45	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	24-May-13 15:00	5	30-May-13 10:45	Received	
8270D TCL SOM01.2 DOD	24-May-13 15:00	5	30-May-13 10:45	Received	
pH 9045D DOD	24-May-13 15:00	5	16-May-13 10:59	Received	
Solids, Dry Weight	24-May-13 15:00	5	12-Nov-13 10:45	Available	
TOC Walkley Black DOD	24-May-13 15:00	5	15-Jun-13 10:45	Received	
A302857-06 Veno-TB01-051613-SD [Water] Sampled 16-May-13 11:50 Eastern					
8260B TCL SOM01.2 DOD	24-May-13 15:00	5	30-May-13 11:50	Received	
A302857-07 Veno-EB01-051613-SD [Water] Sampled 16-May-13 06:45 Eastern					
8081B DOD	24-May-13 15:00	5	23-May-13 06:45	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	24-May-13 15:00	5	30-May-13 06:45	Received	
8270D TCL SOM01.2 DOD	24-May-13 15:00	5	23-May-13 06:45	Received	

A302857

ENCO Orlando

Client:	CH2M Hill, Inc. (CH029)	Lab Project Mgr:	Marcia Colon
Project:	East Vieques La Chiva SWMU 1, CTO-0037	Project Number:	408040
PO #:	948828		

Analysis	Due	TAT	Expires	Status	Comments
Kemron Environmental Service					
A302857-01 Veno-SD11-000H [Soil] Sampled 16-May-13 08:50 Eastern					
Grain Size ASTM D422	24-May-13 15:00	5	13-Jun-13 08:50	SubContracted	to Kemron
A302857-02 Veno-SD11-0H01 [Soil] Sampled 16-May-13 09:00 Eastern					
Grain Size ASTM D422	24-May-13 15:00	5	13-Jun-13 09:00	SubContracted	to Kemron
A302857-03 Veno-SD10-000H [Soil] Sampled 16-May-13 09:50 Eastern					
Grain Size ASTM D422	24-May-13 15:00	5	13-Jun-13 09:50	SubContracted	to Kemron
A302857-04 Veno-SD08-000H [Soil] Sampled 16-May-13 10:15 Eastern					
Grain Size ASTM D422	24-May-13 15:00	5	13-Jun-13 10:15	SubContracted	to Kemron
A302857-05 Veno-SD09-000H [Soil] Sampled 16-May-13 10:45 Eastern					
Grain Size ASTM D422	24-May-13 15:00	5	13-Jun-13 10:45	SubContracted	to Kemron

054

Reviewed By

Date

YES NO N/A

I. **PACKAGE COMPLETENESS AND DELIVERABLES**

CASE NUMBER: A302857 LAB: A302857 / ENCO

SITE NAME: East Vieques La Chiva SWMU 1

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format or CLP Forms Equivalent? ✓ ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative, and/or cover letter signed release present? ✓ ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? ✓ ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

II. **VOLATILE ANALYSES**

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Reports, and/or Chain of Custodies from the field samplers present for all samples sign release present? ✓ ___ ___

ACTION: If no, contact the laboratory/sampling team for replacement of missing or illegible copies.

1.2 Is a sampling trip report present (if required)? ✓ ___ ___

1.3 Sample Conditions/Problems

YES NO N/A

1.3.1 Do the Traffic Reports, Chain of Custodies, or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ✓ [ ]

ACTION: If all the VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, flag all positive results "J" and all non-detects "R".

All attached sheet

ACTION: If samples were not iced or if the ice was melted upon receipt at the laboratory and the temperature of the cooler was elevated (>10°C), flag all positive results "J" and all non-detects non"UJ".

temp 5.0°C

2.0 Holding Times

2.1 Have any volatile holding times, determined from date of collection to date of analysis, been exceeded? [ ] ✓

The maximum holding time for aqueous samples is 14 days.

The maximum holding time for soils non aqueous samples is 14 days.

NOTE: If unpreserved, aqueous samples maintained at 4°C for aromatic hydrocarbons analysis must be analyzed within 7 days. If preserved with HCL acid to a pH<2 and stored at 4°C, then aqueous samples must be analyzed within 14 days from time of collection. For non-aqueous samples for volatile components that are frozen (less than 7°C) or are properly cooled (4°C ± 2°C) and perserved with $NaHSO_4$, the maximum holding time is 14 days from sample collection. If

HOLDING TIME SUMMARY

EPA 8260B

Laboratory: ENCO Orlando

SDG: A302857-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
Veno-SD11-000H	05/16/13 08:50	05/17/13 09:25	05/21/13 12:35	NA	NA	05/21/13 21:08	5.00	14.00	
Veno-SD11-0H01	05/16/13 09:00	05/17/13 09:25	05/21/13 12:35	NA	NA	05/21/13 21:40	5.00	14.00	
Veno-SD10-000H	05/16/13 09:50	05/17/13 09:25	05/21/13 12:35	NA	NA	05/21/13 22:11	5.00	14.00	
Veno-SD08-000H	05/16/13 10:15	05/17/13 09:25	05/21/13 12:35	NA	NA	05/21/13 22:43	5.00	14.00	
Veno-SD09-000H	05/16/13 10:45	05/17/13 09:25	05/21/13 12:35	NA	NA	05/21/13 23:14	5.00	14.00	
Veno-TB01-051613-SD	05/16/13 11:50	05/17/13 09:25	05/24/13 12:57	NA	NA	05/24/13 17:14	8.00	14.00	
Veno-EB01-051613-SD	05/16/13 06:45	05/17/13 09:25	05/24/13 12:57	NA	NA	05/24/13 17:44	8.00	14.00	

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 302857

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	% Moisture
VENO-SD11-000H	57.61
VENO-SD08-000H	65.34
VENO-SD09-000H	57.16

YES NO N/A

uncertain about preservation, contact the laboratory /sampling team to determine whether or not samples were preserved.

ACTION: Qualify sample results according to Table 1:

Table 1. Holding Time Actions for Trace Volatile Analysis

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤7 days	No qualifications	
	No	> 7 days	J	R
	Yes	≤14 days	No qualifications	
	Yes	> 14 days	J	R
Non Aqueous	No	≤ 14 days	J	R
	Yes	≤ 14 days	No qualifications	
	Yes/No	> 14 days	J	R

3.0 Surrogate Recovery (CLP Form II Equivalent)

3.1 Have the volatile surrogate recoveries been listed on Surrogate Recovery forms for each of the following matrices:

a. Water ✓ ___ ___

b. Soil ✓ ___ ___

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery forms for each matrix:

a. Water ✓ ___ ___

b. Soil ✓ ___ ___

ACTION: If large errors exist, deliverables are unavailable or information is missing, document the effect(s) in Data

YES NO N/A

Assessments and contact the laboratory/project officer/appropriate official for an explanation /resubmittal, make any necessary corrections and document effect in the Data Assessment.

3.3 Were the surrogate recovery limits followed per Table 2. If Table 2 criteria were not followed, the laboratory may use in-house performance criteria (per SW-846, Method 8000C, section 9.7). Other compounds may be used as surrogates, depending upon the analysis requirements. lab [✓] ___ ___

Table 2. Surrogate Spike Recovery Limits for Water and Soil/Sediments

DMC	Recovery Limits (%)Water	Recovery Limits Soil/Sediment
4-Bromofluorobenzene	80-120	70-130
Dibromofluoromethane	80-120	70-130
Toluene-d_8	80-120	70-130
Dichloroethane-d_4	80-120	70-130

Note: Use above table if laboratory did not provide in house recovery criteria.

Note: Other compounds may be used as surrogated depending upon the analysis requirements.

3.4 Were outliers marked correctly with an asterisk? [✓] ___ ___

ACTION: Circle all outliers with a red pencil.

3.5 Were one or more volatile surrogate recoveries out of specification for any sample or method blank. Table 2. [✓] ___ ___

If yes, were samples reanalyzed? [ ] ✓ ___ 8/10/13
See attached e-mail from lab
Were method blanks reanalyzed? [ ] ___ ✓

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24249	Instrument:	OVGCMS2
Matrix:	Soil	Calibration:	1301045

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA24249-CCV1)			Lab File ID: 2EP002.D		Analyzed: 05/21/13 14:06			
Dibromofluoromethane	50.0	91	80 - 120	10.9	10.898	0.0020	+/-1.0	
Toluene-d8	50.0	106	80 - 120	13.16	13.16	0.0000	+/-1.0	
4-Bromofluorobenzene	50.0	100	80 - 120	15.67	15.674	-0.0040	+/-1.0	
LCS (3E21023-BS1)			Lab File ID: 2EP003.D		Analyzed: 05/21/13 15:16			
Dibromofluoromethane	0.0500	93	74 - 133	10.9	10.898	0.0020	+/-1.0	
Toluene-d8	0.0500	106	85 - 115	13.16	13.16	0.0000	+/-1.0	
4-Bromofluorobenzene	0.0500	95	85 - 120	15.67	15.674	-0.0040	+/-1.0	
Blank (3E21023-BLK1)			Lab File ID: 2EP006.D		Analyzed: 05/21/13 16:56			
Dibromofluoromethane	0.0500	89	74 - 133	10.91	10.898	0.0120	+/-1.0	
Toluene-d8	0.0500	102	85 - 115	13.17	13.16	0.0100	+/-1.0	
4-Bromofluorobenzene	0.0500	94	85 - 120	15.68	15.674	0.0060	+/-1.0	
Veno-SD11-000H (A302857-01)			Lab File ID: 2EP014.D		Analyzed: 05/21/13 21:08			
Dibromofluoromethane	0.133	84	74 - 133	10.91	10.898	0.0120	+/-1.0	
Toluene-d8	0.133	92	85 - 115	13.16	13.16	0.0000	+/-1.0	
4-Bromofluorobenzene	0.133	83	85 - 120	15.67	15.674	-0.0040	+/-1.0	* J/UJ
Veno-SD11-0H01 (A302857-02)			Lab File ID: 2EP015.D		Analyzed: 05/21/13 21:40			
Dibromofluoromethane	0.0585	87	74 - 133	10.91	10.898	0.0120	+/-1.0	
Toluene-d8	0.0585	95	85 - 115	13.16	13.16	0.0000	+/-1.0	
4-Bromofluorobenzene	0.0585	86	85 - 120	15.67	15.674	-0.0040	+/-1.0	
Veno-SD10-000H (A302857-03)			Lab File ID: 2EP016.D		Analyzed: 05/21/13 22:11			
Dibromofluoromethane	0.0931	86	74 - 133	10.9	10.898	0.0020	+/-1.0	
Toluene-d8	0.0931	95	85 - 115	13.16	13.16	0.0000	+/-1.0	
4-Bromofluorobenzene	0.0931	87	85 - 120	15.67	15.674	-0.0040	+/-1.0	
Veno-SD08-000H (A302857-04)			Lab File ID: 2EP017.D		Analyzed: 05/21/13 22:43			
Dibromofluoromethane	0.180	86	74 - 133	10.9	10.898	0.0020	+/-1.0	
Toluene-d8	0.180	96	85 - 115	13.17	13.16	0.0100	+/-1.0	
4-Bromofluorobenzene	0.180	86	85 - 120	15.68	15.674	0.0060	+/-1.0	
Veno-SD09-000H (A302857-05)			Lab File ID: 2EP018.D		Analyzed: 05/21/13 23:14			
Dibromofluoromethane	0.121	88	74 - 133	10.9	10.898	0.0020	+/-1.0	
Toluene-d8	0.121	96	85 - 115	13.17	13.16	0.0100	+/-1.0	
4-Bromofluorobenzene	0.121	84	85 - 120	15.68	15.674	0.0060	+/-1.0	*

J/UJ

YES NO N/A

ACTION: If all surrogate recoveries are > 10% but 1 or more compounds do not meet method specifications:

1. Flag all positive results as estimated ("J").
2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.
3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects, but qualify positive results as estimated "J".

If any surrogate has a recovery of < 10%:

1. Positive results are qualified with ("J").
2. Non-detects for that should be qualified as unusable ("R").

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. The basic concern is whether the blank problems represent an isolated problem with the blank alone or whether there is a fundamental problem with the analytical process. If one or more samples in the batch show acceptable surrogate recoveries, the reviewer may choose the blank problem to be an isolated occurrence.

3.6 Are there any transcription/calculation errors between raw data and reported data? [ ] ✓ ___

ACTION: If large errors exist, take action as specified in section 3.2 above.

4.0 Laboratory Control Sample(Form III/Equivalent)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples of a similar matrix, per SDG. [✓] ___ ___

YES NO N/A

Note: LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

4.2 Were the Laboratory Control Samples analyzed at the required frequency for each of the following matrices:

A. Water [✓] ___ ___

B. Soil [✓] ___ ___

C. Med Soil [ ] ___ ___

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

4.3 Have in house LCS recovery limits been developed (Method 8000C, Sect 9.7). [✓] ___ ___

4.4 If in house limits are not developed, are LCS acceptance recovery limits between 70 - 130% (Method 8000c Sect 9.5)? [ ] ___ ✓

4.5 Were one or more of the volatile LCS recoveries outside the in house laboratory recovery criteria for spiked analytes? If in house limits are not present use 70 - 130% recovery limits.
[ ] ✓ ___

YES NO N/A

Table 3. LCS Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	Non-Detected Spiked Compounds
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

MS/MSD not assoc w/ samples in SDG

5.0 Matrix Spikes(Form III or equivalent)

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? [ ] ___ ✓

NOTE: The laboratory should use one matrix spike and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If the sample is not expected to contain target analytes, a MS/MSD should be analyzed (SW-846, Method 8260B, Sect 8.4.2).

5.2 Have MS/MD or MS/MSD results been summarized on modified CLP Form III? [ ] ___ ✓

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples

YES NO N/A

of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000C, section 9.5.])

a. Water [ ] ___ ✓

b. Waste [ ] ___ ✓

c. Soil/Solid [ ] ___ ✓

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene. The concentration of the LCS should be determined as described SW-Method 8000C Section 9.5.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 Have in house MS recovery limits been developed (Method 8000C, Sect 9.7)for each matrix. [ ] ___ ✓

5.5 Were one or more of the volatile MS/MSD recoveries outside of the in-house laboratory recovery criteria for spiked analytes? If none are present, then use 70-130% recovery as per SW-846, 8000C, Sect. 9.5.4. [ ] ___ ✓

ACTION: Circle all outliers with a red pencil.

NOTE: If any individual % recovery in the MS (or MSD) falls outside the designated range for recovery the reviewer should determine if there is a matrix effect. A matrix effect is indicated if the LCS data are within limits but the MS data exceeds the limits.

YES NO N/A

NOTE: No qualification of data is necessary on MS and MSD data alone. However, using informed professional judgement, the data reviewer may use MS and MSD results in conjunction with other QC criteria to determine the need for some qualification.

Note: The data reviewer should first try to determine to what extent the results of the MS and MSD affect the associated data. This determination should be made with regard to he MS and MSD sample itself, as well as specific analytes for all samples associated with the MS and MSD.

Note: In those instances where it can be determine that the results of the MS and MSD affect only the sample spiked, limit qualification to this sample only. However, it may be determined through the MS and MSD results that a laboratory is having a systematic problem in the analysis of one or more analytes that affect all associated samples, and the reviewer must use professional judgement to qualify the data from all associated samples.

Note: The reviewer must use professional judgement to determine the need for qualification of non-spiked compounds.

ACTION: Follow criteria in Table 4 when professional judgement deems qualification of sample.

Table 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	Non-Detected Spiked Compounds
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

YES NO N/A

6.0 Blank (CLP Form IV Equivalent)

6.1 Is the Method Blank Summary form present? [✓] ___ ___

6.2 Frequency of Analysis: Has a method blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? [✓] ___ ___

6.3 Has a method blank been analyzed for each GC/MS system used ? [✓] ___ ___

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject ® all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.4 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for volatile organic compounds? [✓] ___ ___

7.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary. [✓] ___ ___

	YES	NO	N/A
7.2 Do any field/rinse blanks have positive volatile organic compound results?		✓	

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 5 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

VENO-TB01-057613-SD MOE

VENO-EB01-057613-SD MOE

Table 5. Volatile Organic Analysis Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, Field, Trip, Instrument**	Detects	Not detected	No qualification
	< CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	> CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U, or qualify the data as unusable R
		≥ CRQL and ≥ blank contamination	Use professional judgement
	= CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	Gross contam-ination	Detects	Qualify results as unusable R

* 2x the CRQL for methylene chloride, 2-butanone, and acetone

** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 ug/L.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected volatile organic target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

YES NO N/A

7.3 Are there field/rinse/equipment blanks associated with every sample? [✓] ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 GC/MS Apparatus and Materials

8.1 Did the lab use the proper gas chromatographic column(s) for analysis of volatiles by Method 8260B? Check raw data, instrument logs or contact the lab to determine what type of column(s) was (were) used. [✓] ___ ___

NOTE: For the analysis of volatiles, the method requires the use of 60 m. x 0.75 mm capillary column, coated with VOCOL(Supelco) or equivalent column. (see SW-846, page 8260B-7, section 4.9.2)

ACTION: If the specified column, or equivalent, was not used, document the effects in the Data Assessment. Use professional judgement to determine the acceptability of the data.

9.0 GC/MS Instrument Performance Check (CLP Form V Equivalent)

9.1 Are the GC/MS Instrument Performance Check forms present for Bromofluorobenzene (BFB), and do these forms list the associated samples with date/time analyzed? [✓] ___ ___

9.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift? [✓] ___ ___

9.3 Has an instrument performance check solution (BFB)

YES NO N/A

been analyzed for every twelve hours of sample analysis per instrument?(see Table 4, SW-846, page 8260B-36) [✓] ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS GC/MS tuning data are available.

ACTION: If the laboratory/project officer cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable, "R".

9.4 Have the ion abundances been normalized to m/z 95? [✓] ___ ___

9.5 Have the ion abundance criteria been met for each instrument used? [✓] ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If ion abundance criteria are not met, take action as specified in section 3.2.

9.6 Are there any transcription/calculation errors between mass lists and reported values? (Check at least two values but if errors are found, check more.) ___ [✓] ___

9.7 Have the appropriate number of significant figures (two) been reported? [✓] ___ ___

ACTION: If large errors exist, take action as specified in section 3.2.

9.8 Are the spectra of the mass calibration compounds acceptable. [✓] ___ ___

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

YES NO N/A

10.0 Target Analytes (CLP Form I Equivalent)

10.1 Are the Organic Analysis reporting forms present with required header information on each page, for each of the following:

a. Samples and/or fractions as appropriate [✓] ___ ___

b. Matrix spikes and matrix spike duplicates [✓] ___ ___

c. Blanks [✓] ___ ___

d. Laboratory Control Samples [✓] ___ ___

10.2 Are the reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

a. Samples and/or fractions as appropriate [✓] ___ ___

b. Matrix spikes and matrix spike duplicates (Mass spectra not required) [✓] ___ ___

c. Blanks [✓] ___ ___

d. Laboratory Control Samples [✓] ___ ___

ACTION: If any data are missing, take action specified in 3.2 above.

10.3 Is chromatographic performance acceptable with respect to:

Baseline stability? [✓] ___ ___

	YES	NO	N/A
Resolution?	[✓]	___	___
Peak shape?	[✓]	___	___
Full-scale graph (attenuation)?	[ ]	___	___

Other:_____

ACTION: Use professional judgement to determine the acceptability of the data.

10.4 Are the lab-generated standard mass spectra of identified volatile compounds present for each sample? [✓] ___ ___

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the Data Assessment. If spectra are missing, contact the lab for missing spectra.

10.5 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration? [✓] ___ ___

10.6 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [✓] ___ ___

10.7 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum? [✓] ___ ___

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected ("R"), flagged ("N") - Presumptive evidence of the presence of the compound) or changed to non detected ("U") at the calculated detection limit. In order to be

YES NO N/A

positively identified, the data must comply with the criteria listed in 9.6, 9.7, and 9.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

No TICs

11.0 Tentatively Identified Compounds (TIC) (CLP Form I/TIC Equivalent)

11.1 If Tentatively Identified Compound were required for this project, are all Tentatively Identified Compound reporting forms present; and do listed TICs include scan number or retention time, estimated concentration and a qualifier? [ ] ___ ✓

NOTE: Add "N" qualifier to all TICs which have CAS number, if missing.

NOTE: Have the project officer/appropriate official check the project plan to determine if lab was required to identify non-target analytes (SW-846, page 8260B-23, Sect. 7.6.2).

11.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:

a. Samples and/or fractions as appropriate [ ] ___ ✓

b. Blanks [ ] ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by a CAS#.

NOTE: If TICs are present in the associated blanks take action as specified in section 3.2 above.

YES NO N/A

11.3 Are any priority pollutants listed as TIC compounds (i.e., an BNA compound listed as a VOA TIC)? [ ] ___ ___

ACTION: 1. Flag with "R" any target compound listed as a TIC.

2. Make sure all rejected compounds are properly reported if they are target compounds.

11.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [ ] ___ ___

11.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%? [ ] ___ ___

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate. Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R". (Common lab contaminants: CO_2(M/E 44), Siloxanes (M/E 73), Hexane, Aldol Condensation Products, Solvent Preservatives, and related byproducts).

12.0 Compound Quantitation and Reported Detection Limits

12.1 Are there any transcription/calculation errors in organic analysis reporting form results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and average initial RRF/CF were used to calculate organic analysis reporting form result. Were any errors found? [ ] ___ ___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be

YES NO N/A

reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

12.2 Are the method CRQL's adjusted to reflect sample dilutions and, for soils, sample moisture? [✓] ___ ___

ACTION: If errors are large, take action as specified in section 3.2 above.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC accedence dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original reporting form (if present) and substituting the data from the analysis of the diluted sample. Specify which organic analysis reporting form is to be used, then draw a red "X" across the entire page of all reporting forms that should not be used, including any in the summary package.

13.0 Standards Data (GC/MS)

13.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant Reports) present for initial and continuing calibration? [✓] ___ ___

ACTION: If any calibration standard data are missing, take action specified in section 3.2 above.

14.0 GC/MS Initial Calibration (CLP Form VI Equivalent)

YES NO N/A

14.1 Are the Initial Calibration reporting forms present and complete for the volatile fraction? [✓] ___ ___

ACTION: If any calibration forms or standard raw data are missing, take action specified in section 3.2 above.

ACTION: If the percent relative standard deviation (% RSD) is > 20%, (8000C-39)qualify positive results for that analyte "J". When % RSD > 90%,. Qualify all positive results for that analyte "J" and all non-detects results for that analyte "R".

14.2 Are all average RRFs > 0.050? [ ] ✓ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list. If individual RRF values reported are below the listed values document in the Data Assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with red pencil.

ACTION: For any target analyte with average RRF < 0.05, or for the requirements for the 5 compounds in 14.2 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

14.3 Are response factors stable over the concentration range of the calibration. [✓] ___ ___

NOTE: (Method Requirement) For the following CCC compounds, the %RSD values must be ≤ 30.0%. If %RSD values reported are > 30.0% document in the Data Assessment.

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA23761	Instrument:	OVGCMS3
		Calibration:	1304028

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA23761-TUN1	3DD001.D	04/09/13 07:52
Initial Cal Blank	AA23761-ICB1	3DD002.D	04/09/13 08:22
Cal Standard	AA23761-CAL3	3DD005.D	04/09/13 10:57
Cal Standard	AA23761-CAL4	3DD006.D	04/09/13 11:35
Cal Standard	AA23761-CAL5	3DD007.D	04/09/13 12:05
Cal Standard	AA23761-CAL6	3DD008.D	04/09/13 12:35
Cal Standard	AA23761-CAL7	3DD009.D	04/09/13 13:15
Cal Standard	AA23761-CAL2	3DD012.D	04/09/13 15:17
Cal Standard	AA23761-CAL1	3DD013.D	04/09/13 16:11
Secondary Cal Check	AA23761-SCV1	3DD015.D	04/09/13 17:11
Secondary Cal Check	AA23761-SCV2	3DD016.D	04/09/13 17:41

INITIAL CALIBRATION DATA (Continued)

EPA 8260B

Laboratory: ENCO Orlando
SDG: A302857-CTO0037
Client: CH2M Hill, Inc. (CH029)
Project: East Vieques La Chiva SWMU 1, CTO-0037

Calibration: 1304028
Instrument: OVGCMS3
Matrix: Water
Calibration Date: 04/09/13 12:32

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Dichlorodifluoromethane	1.045137	9.352221	4.963333	0.1039146			15	
Chloromethane	1.452689	11.06914	5.516667	9.312013E-02			SPCC (0.1)	
Vinyl chloride	1.020702	9.178679	5.758334	6.701462E-02			CCC (30)	
Bromomethane	0.4083474	9.871646	6.561667	6.314456E-02			15	
Chloroethane	0.4588251	7.830256	6.836	0.2844984			15	
Trichlorofluoromethane	1.037116	6.81401	7.121667	0.1643185			15	
Freon 113	0.6347338	14.18108	8.096667	0.1025793			15	
Acetone	0.2386982	14.93262	9.035	0.0574048			15	
1,1-Dichloroethene	0.4766797	11.93991	8.066667	0.1012719			CCC (30)	
Carbon disulfide	2.19121	12.62861	8.153333	6.094817E-02			15	
Methylene Chloride	0.8494747	9.791554	8.966667	5.956773E-02			15	
Methyl-tert-Butyl Ether	1.237679	10.64301	9.306667	5.750991E-02			15	
trans-1,2-Dichloroethene	0.7685398	11.74591	9.188333	4.565442E-02			15	
cis-1,2-Dichloroethene	0.7417976	9.613822	10.615	5.201376E-02			15	
1,1-Dichloroethane	1.513364	13.23991	9.998333	7.496301E-02			SPCC (0.1)	
2-Butanone	4.396173E-02	9.342482	11.19833	6.608805E-02	JR		15	
Chloroform	1.402463	13.48206	10.88167	4.060685E-02			CCC (30)	
Bromochloromethane	0.3400808	11.51802	10.845	5.034445E-02			15	
1,1,1-Trichloroethane	0.9983739	9.850187	11.14667	4.894411E-02			15	
Methyl acetate	0.0853104	8.639185	9.178333	8.186206E-02			15	
Cyclohexane	1.39921	13.9509	10.85667	4.714439E-02			15	
Methyl cyclohexane	0.798159	11.89129	12.08167	2.693545E-02			15	
Carbon Tetrachloride	0.4837738	9.638003	11.075	4.711337E-02			15	
1,2-Dichloroethane	0.6051964	8.466085	11.72667	5.018619E-02			15	
Benzene	1.740088	11.51781	11.52333	3.724768E-02			15	
Trichloroethene	0.379863	4.706333	12.07167	3.040346E-02			15	
1,2-Dichloropropane	0.4922404	11.82531	12.59167	3.103671E-02			CCC (30)	
Bromodichloromethane	0.5709082	9.471192	12.61167	2.714976E-02			15	
4-Methyl-2-pentanone	3.096077E-02	11.89777	13.67429	7.079945E-02	JR		15	
2-Hexanone	0.2386703	12.96292	14.38714	3.691063E-02			15	
cis-1,3-Dichloropropene	0.6473497	14.8153	13.18167	0.0252442			15	
Toluene	1.148689	6.382588	13.39333	3.931257E-02			CCC (30)	

INITIAL CALIBRATION DATA (Continued)

EPA 8260B

Laboratory: ENCO Orlando
SDG: A302857-CTO0037
Client: CH2M Hill, Inc. (CH029)
Project: East Vieques La Chiva SWMU 1, CTO-0037

Calibration: 1304028
Instrument: OVGCMS3
Matrix: Water
Calibration Date: 04/09/13 12:32

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
trans-1,3-Dichloropropene	0.5790786	13.40691	13.73333	4.198359E-02			15	
1,1,2-Trichloroethane	0.3784046	12.94258	13.89667	3.938419E-02			15	
Tetrachloroethene	0.3671155	7.951935	13.75667	3.424653E-02			15	
Dibromochloromethane	0.3921035	12.27866	14.08667	3.823486E-02			15	
1,2-Dibromoethane	0.3416361	5.581962	14.34833	3.245463E-02			15	
Chlorobenzene	1.227335	11.68599	14.78	1.210796E-02			SPCC (0.3)	
Ethylbenzene	0.5285616	11.76174	14.73667	0.0347469			CCC (30)	
m,p-Xylenes	0.7123413	8.756345	14.855	3.720799E-02			15	
o-Xylene	0.6615623	12.05617	15.27833	2.784823E-02			15	
Bromoform	0.2399217	13.34164	15.43333	3.579741E-02			SPCC (0.1)	
Styrene	1.072471	14.53876	15.32167	2.787352E-02			15	
Isopropylbenzene	1.710677	10.63016	15.55333	3.394314E-02			15	
1,1,2,2-Tetrachloroethane	0.4673375	9.30072	16.03333	0.019101			SPCC (0.3)	
1,2,4-Trichlorobenzene	1.08187	12.86485	20.16333	4.233861E-02			15	
1,3-Dichlorobenzene	1.835363	10.35498	17.075	3.532443E-02			15	
1,4-Dichlorobenzene	1.862128	9.840238	17.17167	2.003261E-02			15	
1,2-Dichlorobenzene	1.686558	14.14791	17.74667	2.651544E-02			15	
1,2-Dibromo-3-chloropropane	0.1220866	8.640953	18.93667	5.518876E-02			15	
1,2,3-Trichlorobenzene	0.8765956	13.63765	21.345	3.763256E-02			15	
Dibromofluoromethane	0.6806788	8.520567	11.085	4.923857E-02			15	
Toluene-d8	1.177503	4.565039	13.34667	3.230521E-02			15	
4-Bromofluorobenzene	0.5738038	10.83719	15.9	1.625923E-02			15	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24312	Instrument:	OVGCMS3
		Calibration:	1304028

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA24312-TUN1	3ES001.D	05/24/13 13:37
Calibration Check	AA24312-CCV1	3ES002.D	05/24/13 14:07
LCS	3E24030-BS1	3ES003.D	05/24/13 14:44
LCS Dup	3E24030-BSD1	3ES004.D	05/24/13 15:14
Blank	3E24030-BLK1	3ES005.D	05/24/13 15:44
Veno-TB01-051613-SD	A302857-06	3ES008.D	05/24/13 17:14
Veno-EB01-051613-SD	A302857-07	3ES009.D	05/24/13 17:44

CONTINUING CALIBRATION CHECK

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OVGCMS3	Calibration:	1304028
Lab File ID:	3ES002.D	Calibration Date:	04/09/13 12:32
Sequence:	AA24312	Injection Date:	05/24/13
Lab Sample ID:	AA24312-CCV1	Injection Time:	14:07

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Dichlorodifluoromethane	A	50.0	55	1.045137	1.146164		9.7	20
Chloromethane	A	50.0	42	1.452689	1.233454	0.1	-15.1	20
Vinyl chloride	A	50.0	45	1.020702	0.9143115		-10.4	20
Bromomethane	A	50.0	40	0.4083474	0.3304848		-19.1	20
Chloroethane	A	50.0	45	0.4588251	0.3921271		-14.5	20
Trichlorofluoromethane	A	50.0	52	1.037116	1.088123		4.9	20
Freon 113	A	50.0	44	0.6347338	0.559993		-11.8	20
Acetone	A	50.0	44	0.2386982	0.2111165		-11.6	20
1,1-Dichloroethene	A	50.0	41	0.4766797	0.3863465		-19.0	20
Carbon disulfide	A	50.0	44	2.19121	1.929125		-12.0	20
Methylene Chloride	A	50.0	42	0.8494747	0.7069091		-16.8	20
Methyl-tert-Butyl Ether	A	50.0	42	1.237679	1.038692		-16.1	20
trans-1,2-Dichloroethene	A	50.0	44	0.7685398	0.6783577		-11.7	20
cis-1,2-Dichloroethene	A	50.0	47	0.7417976	0.697552		-6.0	20
1,1-Dichloroethane	A	50.0	44	1.513364	1.332675	0.1	-11.9	20
2-Butanone	A	50.0	47	4.396173E-02	4.102025E-02		-6.7	20
Chloroform	A	50.0	52	1.402463	1.468953		4.7	20
Bromochloromethane	A	50.0	46	0.3400808	0.3153896		-7.3	20
1,1,1-Trichloroethane	A	50.0	58	0.9983739	1.166262		16.8	20
Methyl acetate	A	50.0	41	0.0853104	7.016849E-02		-17.7	20
Cyclohexane	A	50.0	42	1.39921	1.188209		-15.1	20
Methyl cyclohexane	A	50.0	42	0.798159	0.6665545		-16.5	20
Carbon Tetrachloride	A	50.0	51	0.4837738	0.4977817		2.9	20
1,2-Dichloroethane	A	50.0	57	0.6051964	0.6841946		13.1	20
Benzene	A	50.0	45	1.740088	1.577712		-9.3	20
Trichloroethene	A	50.0	53	0.379863	0.4036727		6.3	20
1,2-Dichloropropane	A	50.0	43	0.4922404	0.4248276		-13.7	20
Bromodichloromethane	A	50.0	56	0.5709082	0.6392035		12.0	20
4-Methyl-2-pentanone	A	50.0	49	3.096077E-02	3.026206E-02		-2.3	20

CONTINUING CALIBRATION CHECK

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OVGCMS3	Calibration:	1304028
Lab File ID:	3ES002.D	Calibration Date:	04/09/13 12:32
Sequence:	AA24312	Injection Date:	05/24/13
Lab Sample ID:	AA24312-CCV1	Injection Time:	14:07

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
2-Hexanone	A	50.0	43	0.2386703	0.2059449		-13.7	20
cis-1,3-Dichloropropene	A	50.0	57	0.6473497	0.7394618		14.2	20
Toluene	A	50.0	49	1.148689	1.126352		-1.9	20
trans-1,3-Dichloropropene	A	50.0	56	0.5790786	0.6486432		12.0	20
1,1,2-Trichloroethane	A	50.0	48	0.3784046	0.3618343		-4.4	20
Tetrachloroethene	A	50.0	52	0.3671155	0.378106		3.0	20
Dibromochloromethane	A	50.0	55	0.3921035	0.427439		9.0	20
1,2-Dibromoethane	A	50.0	57	0.3416361	0.388343		13.7	20
Chlorobenzene	A	50.0	51	1.227335	1.252224	0.3	2.0	20
Ethylbenzene	A	50.0	57	0.5285616	0.6035615		14.2	20
m,p-Xylenes	A	100	110	0.7123413	0.7881631		10.6	20
o-Xylene	A	50.0	53	0.6615623	0.7009922		6.0	20
Bromoform	A	50.0	53	0.2399217	0.2534963	0.1	5.7	20
Styrene	A	50.0	58	1.072471	1.254862		17.0	20
Isopropylbenzene	A	50.0	58	1.710677	1.993927		16.6	20
1,1,2,2-Tetrachloroethane	A	50.0	53	0.4673375	0.4974221	0.3	6.4	20
1,2,4-Trichlorobenzene	A	50.0	51	1.08187	1.108237		2.4	20
1,3-Dichlorobenzene	A	50.0	47	1.835363	1.738657		-5.3	20
1,4-Dichlorobenzene	A	50.0	47	1.862128	1.734487		-6.9	20
1,2-Dichlorobenzene	A	50.0	47	1.686558	1.589484		-5.8	20
1,2-Dibromo-3-chloropropane	A	50.0	56	0.1220866	0.1363799		11.7	20
1,2,3-Trichlorobenzene	A	50.0	56	0.8765956	0.9822859		12.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

YES NO N/A

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

ACTION: Circle all outliers with a red pencil.

ACTION: If the % RSD is > 20.0%, or > 30% for the 6 compounds in 14.3 above, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

14.4 Was the % RSD determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the linearity of the initial calibration? Document any effects to the case in the Data Assessment.

14.5 Are there any transcription/calculation errors in the reporting of RRF or % RSD? (Check at least two values but if errors are found, check more.) [ ] ___ ___

ACTION: Circle errors with a red pencil.

ACTION: If errors are large, take action as specified in section 3.2 above.

15.0 <u>GC/MS Calibration Verification (CLP Form VII Equivalent)</u>

YES NO N/A

15.1 Are the Calibration Verification reporting forms present and complete for all compounds of interest? [✓] ___ ___

15.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument? [✓] ___ ___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

_____

ACTION: If any forms are missing or no calibration verification standard has been analyzed twelve hours prior to sample analysis, take action as specified in section 3.2 above. If calibration verification data are not available, flag all associated sample data as unusable ("R").

15.3 Was the % D determined from the calibration verification determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the calibration verification? Document any effects to the case in the Data Assessment.

15.4 Do any volatile compounds have a % D (difference or drift) between the initial and continuing RRF or CF which exceeds 20% (SW-846, page 8260B-19, section 7.4.5.2). [ ] ✓ ___

NOTE: (Method Requirement) For the following CCC compounds, the %D values must be ≤ 20.0%. If %D values reported are > 20.0% document in the Data Assessment.

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

YES NO N/A

ACTION: Circle all outliers with a red pencil.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated, "J". When %D is above 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

15.5 Do any volatile compounds have a RRF < 0.05? [✓] ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list for each calibration verification. If average RRF values reported are below the listed values document in the data assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with a red pencil.

ACTION: If RRF < 0.05, or < the requirements for the 5 compounds is section 15.5 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

16.0 Internal Standards (CLP Form VIII Equivalent)

16.1 Are the internal standard (IS) areas on the internal standard reporting forms of every sample and blank within the upper and lower limits (-50% to + 100%) for each initial mid-point calibration (SW-846, 8260B-20, Sect. 7.4.7)? [✓] ___ ___

YES NO N/A

ACTION: If errors are large or information is missing, take action as specified in section 3.2 above.

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area Lower Limit	Area Upper Limit

(Attach additional sheets if necessary.)

ACTION:

1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.

2. Do not qualify non-detects when the associated IS are counts area > + 100%.

3. If the IS area is below the lower limit (< -50%), qualify all associated non-detects (U-values) "J".

4. If extremely low area counts are reported (< -25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable "R" and positive results as estimated "J".

16.2 Are the retention times of all internal standards within 30 seconds of the associated initial mid-point calibration standard (SW-846, 8260B-20, Sect. 7.4.6)? [U] ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

YES NO N/A

17.0 Field Duplicates

17.1 Were any field duplicates submitted for volatile analysis? [ ] [✓] [ ]

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the Data Assessment. However, if large differences exist, take action specified in section 3.2 above.

DataQual

From: Marcia Colon <mcolon@encolabs.com>
Sent: Wednesday, July 03, 2013 2:00 PM
To: 'DataQual'
Cc: Juliana.Dean@ch2m.com; 'Michael Zamboni'; 'Jacqueline Cleveland'
Subject: RE: CTO-037 La Chiva VOA fraction

Hi Laura-These samples were not rerun for the low 4-BFB. The other 2 surrogates were within acceptable limits and since the 4-BFB only failed minimally the analyst did not rerun. The soils were problematic for SVOC and pesticide and thus the analyst feels that the low 4-BFB recovery could be attributed to the matrix interference.

Let me know if you need more information, I'll be out Friday but back Monday.

Happy 4th!!
Marcia

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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ENCO is an eco-friendly lab offering paperless service options, please contact me anytime with questions.

From: DataQual [mailto:dataqual@charter.net]
Sent: Wednesday, July 03, 2013 12:38 PM
To: Marcia Colon
Cc: Juliana.Dean@ch2m.com; Michael Zamboni; Jacqueline Cleveland
Subject: CTO-037 La Chiva VOA fraction

Hi Marcia,

The following questions are for project CTO-037 East Vieques La Chiva concerning the **VOA fraction** data packages.

SDG# A302870

- Sample VENO-SD04-000H (A302870-05) exhibited a low surrogate recovery. I am not finding that the sample was re-analyzed. Please check if the sample was re-analyzed and if so please provide the sample analysis and all associated forms.

SDG# A302428

- Sample VENO-SD02-0H01 (A302428-13) exhibited a low surrogate recovery. I am not finding that the sample was re-analyzed. Please check if the sample was re-analyzed and if so please provide the sample analysis and all associated forms.

SDG# A302857

- Samples VENO-SD11-0H01 (A302857-01) and VENO-SD09-000H (A302857-05exhibited a low surrogate recovery. I am not finding that these samples were re-analyzed. Please check if the samples were re-analyzed and if so please provide the sample analyses and all associated forms.

If there are any questions concerning these issues please feel free to contact me.

Thank you,
Laura

Laura Maschhoff
DataQual Environmental Services, LLC
dataqual@charter.net
314-330-1327

YES NO N/A

E - The concentration of this analyte exceeds the calibration range of the instrument.

A - Indicates a Tentatively Identified Compound (TIC) is a suspected adol-condensation product.

X,Y,Z- Laboratory defined flags. The data reviewer must change these qualifiers during validation so that the data user may understand their impact on the data.

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: A302857 LAB: ENCO

SITE NAME: East Vieques La Chiva SWMU 1

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format? [✓] ___ ___

ACTION: If not, note the effect on review of the data in the data assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? [✓] ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? [✓] ___ ___

YES NO N/A

II. SEMIVOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Report Forms present for all samples? [✓] ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ___ [ ] ___

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, all non-detects data are qualified as unusable (R), and detects are flagged "J".

See attached sheet

ACTION: If samples were not iced, or if the ice was melted upon arrival at the laboratory and the cooler temperature was elevated (10°C), flag all positive results "J" and all non-detects "UJ".

5°C

2.0 Holding Times

2.1 Have any semivolatile technical holding times, determined from date of collection to date of extraction, been exceeded? ✓ [ ] ___

Continuous extraction of water samples for semivolatile analysis must be started within **7** days of the date of collection. Soil/sediment samples must be extracted within **14** days of collection. Extracts must be analyzed within

See attached sheet

YES NO N/A

40 days of the date of extraction.

Table of Holding Time Violations

Sample ID	Sample Matrix	Date Sampled	Date Lab Received	(See Traffic Report) Date Extracted	Date Analyzed
	See attached sheet				

ACTION: If technical holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all results should be qualified "J", but the reviewer may determine that non-detect data are unusable ("R"). If holding times are exceeded by more than 28 days, all non-detect data are unusable (R).

HOLDING TIME SUMMARY

EPA 8270D

Laboratory: ENCO Orlando

SDG: A302857-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
Veno-SD11-000H	05/16/13 08:50	05/17/13 09:25	05/22/13 09:00	6.00	14.00	06/03/13 16:29	12.00	40.00	
Veno-SD11-0H01	05/16/13 09:00	05/17/13 09:25	05/22/13 09:00	6.00	14.00	06/03/13 16:58	12.00	40.00	
Veno-SD10-000H	05/16/13 09:50	05/17/13 09:25	05/22/13 09:00	6.00	14.00	06/03/13 17:26	12.00	40.00	
Veno-SD08-000H	05/16/13 10:15	05/17/13 09:25	05/22/13 09:00	6.00	14.00	06/03/13 17:55	12.00	40.00	
Veno-SD09-000H	05/16/13 10:45	05/17/13 09:25	05/22/13 09:00	6.00	14.00	06/03/13 18:23	12.00	40.00	
Veno-SD09-000H RE	05/16/13 10:45	05/17/13 09:25	06/07/13 09:45	22.00	14.00	06/10/13 18:33	3.00	40.00	•
Veno-EB01-051613-SD	05/16/13 06:45	05/17/13 09:25	05/22/13 01:30	6.00	7.00	06/05/13 14:34	14.00	40.00	

JVJ

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 302857

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	% Moisture
VENO-SD11-000H	57.61
VENO-SD08-000H	65.34
VENO-SD09-000H	57.16

	YES	NO	N/A
3.0 Surrogate Recovery (Form II/Equivalent)			
3.1 Have the semi volatile surrogate recoveries been listed on CLP Surrogate Recovery forms (Form II) for each of the following matrices:			
a. Low Water	✓		
b. Low/Med Soil	✓		
3.2 If so, are all the samples listed on the appropriate Surrogate Recovery Summary forms for each matrix:			
a. Low Water	✓		
b. Low/Med Soil	✓		
ACTION: If CLP deliverables are unavailable, document the effect(s) in data assessments. In some cases the lab may have to be contacted to obtain the data necessary to complete the validation.			
3.3 Were outliers marked correctly with an asterisk?	✓		
ACTION: Circle all outliers in red.			
3.4 Were two or more base neutral OR acid surrogate recoveries out of specification for any sample or method blank (Reviewer should use lab in house recovery limits. Use surrogate recovery limits from USEPA National Functional Guidlines January 2005 page 130, if in house limits are not available. See Method 8000B-43 or 80000C-24).	✓		
Note: Examine lab in house limits for reasonableness.			
If yes, were samples re-analyzed?	✓		

	YES	NO	N/A
Were method blanks re-analyzed?	✓		

ACTION: If all surrogate recoveries are > 10% but two within the base-neutral or acid fraction do not meet method specifications, <u>for the affected fraction only (i.e. either base-neutral or acid compounds):</u>

1. Flag all positive results as estimated ("J").

2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.

3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects.

If any base-neutral <u>or</u> acid surrogate has a recovery of < 10%:

1. Positive results for the fraction with < 10% surrogate recovery are qualified with "J".

2. Non-detects for that fraction should be qualified as unusable (R) .

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. Check the internal standard areas.

	YES	NO	N/A
3.5 Are there any transcription/calculation errors between raw data and Form II?		✓	

ACTION: If large errors exist, call lab for explanation/resubmittal, make any necessary corrections and document

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8270D

Laboratory: ENCO Orlando
SDG: A302857-CTO0037
Client: CH2M Hill, Inc. (CH029)
Project: East Vieques La Chiva SWMU 1, CTO-0037

Sequence: AA24398
Instrument: OSVGCMS1
Matrix: Soil
Calibration: 1304084

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (3E22007-MSD1)			Lab File ID: 1f3008.D		Analyzed: 06/03/13 12:39			
2-Fluorophenol	3.54	64	35 - 105	5.327	5.3845	-0.0575	+/-0.5	
Phenol-d5	3.54	64	40 - 100	6.406	6.4685	-0.0625	+/-0.5	
Nitrobenzene-d5	3.54	69	35 - 100	7.546	7.626	-0.0800	+/-0.5	
2-Fluorobiphenyl	3.54	63	45 - 105	9.775	9.8535	-0.0785	+/-0.5	
2,4,6-Tribromophenol	3.54	79	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	3.54	91	30 - 125	14.5	14.57375	-0.0738	+/-0.5	
Veno-SD11-000H (A302857-01)			Lab File ID: 1f3016.D		Analyzed: 06/03/13 16:29			
2-Fluorophenol	3.88	53	35 - 105	5.317	5.3845	-0.0675	+/-0.5	
Phenol-d5	3.88	58	40 - 100	6.396	6.4685	-0.0725	+/-0.5	
Nitrobenzene-d5	3.88	47	35 - 100	7.546	7.626	-0.0800	+/-0.5	
2-Fluorobiphenyl	3.88	40	45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	3.88	52	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	3.88	68	30 - 125	14.5	14.57375	-0.0738	+/-0.5	
Veno-SD11-0H01 (A302857-02)			Lab File ID: 1f3017.D		Analyzed: 06/03/13 16:58			
2-Fluorophenol	1.73	61	35 - 105	5.317	5.3845	-0.0675	+/-0.5	
Phenol-d5	1.73	69	40 - 100	6.396	6.4685	-0.0725	+/-0.5	
Nitrobenzene-d5	1.73	58	35 - 100	7.546	7.626	-0.0800	+/-0.5	
2-Fluorobiphenyl	1.73	52	45 - 105	9.775	9.8535	-0.0785	+/-0.5	
2,4,6-Tribromophenol	1.73	64	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	1.73	92	30 - 125	14.5	14.57375	-0.0738	+/-0.5	
Veno-SD10-000H (A302857-03)			Lab File ID: 1f3018.D		Analyzed: 06/03/13 17:26			
2-Fluorophenol	3.13	47	35 - 105	5.317	5.3845	-0.0675	+/-0.5	
Phenol-d5	3.13	52	40 - 100	6.396	6.4685	-0.0725	+/-0.5	
Nitrobenzene-d5	3.13	41	35 - 100	7.536	7.626	-0.0900	+/-0.5	
2-Fluorobiphenyl	3.13	33	45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	3.13	49	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	3.13	79	30 - 125	14.5	14.57375	-0.0738	+/-0.5	
Veno-SD08-000H (A302857-04)			Lab File ID: 1f3019.D		Analyzed: 06/03/13 17:55			
2-Fluorophenol	4.74	50	35 - 105	5.317	5.3845	-0.0675	+/-0.5	
Phenol-d5	4.74	56	40 - 100	6.396	6.4685	-0.0725	+/-0.5	
Nitrobenzene-d5	4.74	42	35 - 100	7.536	7.626	-0.0900	+/-0.5	
2-Fluorobiphenyl	4.74	25	45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	4.74	42	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	4.74	48	30 - 125	14.5	14.57375	-0.0738	+/-0.5	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24398	Instrument:	OSVGCMS1
Matrix:	Soil	Calibration:	1304084

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Veno-SD09-000H (A302857-05)			Lab File ID: 1f3020.D		Analyzed: 06/03/13 18:23			
2-Fluorophenol	3.89	9	35 - 105	5.307	5.3845	-0.0775	+/-0.5	*
Phenol-d5	3.89	10	40 - 100	6.396	6.4685	-0.0725	+/-0.5	*
Nitrobenzene-d5	3.89	5	35 - 100	7.536	7.626	-0.0900	+/-0.5	*
2-Fluorobiphenyl	3.89		45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	3.89		35 - 125	11.644	11.72025	-0.0762	+/-0.5	*
Terphenyl-d14	3.89	6	30 - 125	14.5	14.57375	-0.0738	+/-0.5	*

Sample not used in favor of RE

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24468	Instrument:	OSVGCMS1
Matrix:	Soil	Calibration:	1304084

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Veno-SD09-000H (A302857-05RE1)			Lab File ID: 1fe017.D		Analyzed: 06/10/13 18:33			
2-Fluorophenol	3.89	57	35 - 105	5.227	5.3845	-0.1575	+/-0.5	
Phenol-d5	3.89	65	40 - 100	6.316	6.4685	-0.1525	+/-0.5	
Nitrobenzene-d5	3.89	44	35 - 100	7.456	7.626	-0.1700	+/-0.5	
2-Fluorobiphenyl	3.89	12	45 - 105	9.691	9.8535	-0.1625	+/-0.5	*
2,4,6-Tribromophenol	3.89	41	35 - 125	11.543	11.72025	-0.1773	+/-0.5	
Terphenyl-d14	3.89	28	30 - 125	14.399	14.57375	-0.1748	+/-0.5	*

J/UJ
B/N

YES NO N/A

effect in data assessments.

Sample 07 not MS/MSD not in this SDG

4.0 Matrix Spikes (Form III/Equivalent)

4.1 Have the semivolatile Matrix Spike and Matrix Spike Duplicate/or duplicate unspiked Sample recoveries been listed on the Recovery Form (Form III)? [ ] ___ ✓

NOTE: Method 3500B/page 4 states the spiking compounds:

Base/neutrals	Acids
1,2,4-Trichlorobenzene	Pentachlorophenol
Acenaphthene	Phenol
2,4-Dinitrotoluene	2-Chlorophenol
Pyrene	4-Chloro-3-methylphenol
N-Nitroso-di-n-propylamine	4-Nitrophenol
1,4-Dichlorobenzene	

Note: Some projects may require the spiking of specific compounds of interest.

Note: See Method 8270D-sec 8.4.2 for deciding on whether to prepare and analyze duplicate samples or a martix spike/matrix spike duplicate. If samples are expected to contain target analytes, then laboratory may use one matrix spike and a duplicate analysis of an unspiked field sample. If samples are not expected to contain target analytes, laboratory should use a matrix spike and matrix spike duplicate pair.

4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Low Water [ ] ___ ✓

b. Low Solid [ ] ___ ✓

c. Med Solid [ ] ___ ✓

YES NO N/A

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above. It may be necessary to contact the lab to obtain the required data.

NOTE: If the data has not been reported on CLP equivalent form, then the laboratory must provide the information necessary to evaluate the spike recoveries in the MS and MSD. The required data which should have been provided by the lab include the analytes and concentrations used for spiking, background concentrations of the spiked analytes (i.e., concentrations in unspiked sample), methods and equations used to calculate the QC acceptance criteria for the spiked analytes, percent recovery data for all spiked analytes.

The data reviewer must verify that all reported equations and percent recoveries are correct before proceeding to the next section.

4.3 Were matrix spikes performed at concentration equal to 100ug/L for acid compounds, and 200ug/l for base compounds (Method 3500B-4), or those specified in project plan. [ ] ___ ✓

4.4 How many semivolatile spike recoveries are outside Laboratory in house MS/MSD recovery limits (use recovery limits values in Method 8270D-43&44 Table 6 if in house values not available).

Water

____ out of ____

Solids

____ out of ____

YES NO N/A

4.5 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water Solids

____ out of ____ ____ out of ____

ACTION: Circle all outliers with red pencil.

ACTION: No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the matrix spike and matrix spike duplicate results in conjunction with other QC criteria to determine the need for some qualification of the data.

4.6 Was a Laboratory Control Sample (LCS) analyzed with each analytical batch? [✓] ___ ___

NOTE: When the results of the matrix spike analysis indicate a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

5.0 Blanks (Form IV/Equivalent)

5.1 Is the Method Blank Summary (Form IV) present? [✓] ___ ___

5.2 Frequency of Analysis:

Has a reagent/method blank analysis been reported per 20 samples of similar matrix, or concentration level, and for each extraction batch? [✓] ___ ___

5.3 Has a method blank been analyzed either after

	YES	NO	N/A
the calibration standard or at any other time during the analytical shift for each GC/MS system used ?	✓		

ACTION: If any method blank data are missing, call lab for explanation/resubmittal. If not available, use professional judgement to determine if the associated sample data should be qualified.

5.4 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra.

	YES	NO	N/A
Is the chromatographic performance (baseline stability) for each instrument acceptable for the semivolatiles?	✓		

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

	YES	NO	N/A
6.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary.		✓	
6.2 Do any field/rinse/ blanks have positive results for target analytes and/or TICs (if required, see section 10 below)?		✓	

YES NO N/A

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case) must be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field Blanks must be qualified for outlying surrogates, poor spectra, instrument performance or calibration QC problems.

ACTION: Follow the directions in the table below to qualify sample results due to contamination. Use the largest value from all the associated blanks. If gross contamination exists, all data in the associated samples should be qualified as unusable (R).

VEND-EP301-057613-SD MOE

YES NO N/A

Blank Action for Semivolatile Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Field	Detects	Not detected	No qualification required
	< CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	= CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	> CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report concentration of sample with a U
		≥ CRQL and ≥ blank contamination	No qualification required

NOTE: Analytes qualified "U" for blank contamination are still considered as "hits" when qualifying for calibration criteria.

NOTE: If the laboratory did not report TIC analyses, check the project plans to verify whether or not it was required.

6.3 Are there field/rinse/equipment blanks associated with every sample? [✓] ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

6.4 Was a instrument blank analyzed after each sample/dilution which contained a target compound

	YES	NO	N/A
that exceeded the initial calibration range.	[ ]	___	✓
6.5 Does the instrument blank have positive results for target analytes and/or TICs?	___	[ ]	✓

Note: Use professional judgement to determine if carryover occurred and qualify analytes accordingly.

7.0 GC/MS Apparatus and Materials

	YES	NO	N/A
7.1 Did the lab use the proper gas chromatographic column for analysis of semivolatiles by Method 8270D? Check raw data, instrument logs or contact the lab to determine what type of column was used. The method requires the use of 30 m x 0.25 mm ID (or 0.32 mm ID), silicone-coated, fused silica, capillary column.	[✓]	___	___

ACTION: If the specified column, or equivalent, was not used, document the effects in the data assessment. Use professional judgement to determine the acceptability of the data.

8.0 GC/MS Instrument Performance Check (Form V/Equivalent)

	YES	NO	N/A
8.1 Are the GC/MS Instrument Performance Check Forms (Form V) present for decafluorotriphenylphosphine (DFTPP)?	[✓]	___	___

NOTE: The performance solution should also contain 4,4-DDT, pentachlorophenol, and benzidine to verify injection port inertness and column performance. The degradation of DDT to DDE and DDD must be less than 20% total and the response of pentachlorophenol and benzidine should be within normal ranges for these compounds (based upon lab experience) and show no peak degradation or tailing before samples are analyzed. (see section 5.5

	YES	NO	N/A
page 8270D-12).			
8.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve hour shift?	✓		
8.3 Has an instrument performance check solution been analyzed for every twelve hours of sample analysis per instrument?	✓		

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS

ACTION: If lab cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable (R).

8.4 Have the ion abundances been normalized to m/z 198?	✓		
8.5 Have the ion abundance criteria been met for each instrument used?	✓		

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

	YES	NO	N/A
ACTION: If ion abundance criteria are not met, take action specified in section 3.2			
8.6 Are there any transcription/calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.)	___	[✓]	___
8.7 Have the appropriate number of significant figures (two) been reported?	[✓]	___	___
ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document effect in data assessments.			
8.8 Are the spectra of the mass calibration compound acceptable?	[✓]	___	___
ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.			
9.0 Target Analytes			
9.1 Are the Organic Analysis Data Sheets (Form I) present with required header information on each page, for each of the following:			
a. Samples and/or fractions as appropriate	[✓]	___	___
b. Matrix spikes and matrix spike duplicates	[✓]	___	___
c. Blanks	[✓]	___	___
9.2 Has any special cleanup, such as GPC, been performed on all soil/sediment sample extracts (see section 7.2, page 8270D-14)?	[ ]	[✓]	___

	YES	NO	N/A
ACTION: If data suggests that extract cleanup was not performed, use professional judgement. Make note in the data assessment narrative.			
9.3 Are the Reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?			
a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)	✓		
c. Blanks	✓		
ACTION: If any data are missing, take action specified in 3.2 above.			
9.4 Are the response factors shown in the Quant Report?	✓		
9.5 Is chromatographic performance acceptable with respect to:			
Baseline stability?	✓		
Resolution?	✓		
Peak shape?	✓		
Full-scale graph (attenuation)?	✓		
Other:_____			
ACTION: Use professional judgement to determine the acceptability of the data.			
9.6 Are the lab-generated standard mass spectra of identified semivolatile compounds present for			

	YES	NO	N/A
each sample?	✓		

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the data assessment narrative. If spectra are missing, reject all positive data.

9.7 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	✓		
9.8 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum?	✓		
9.9 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum?	✓		

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected (R), flagged "N" (Presumptive evidence of the presence of the compound) or changed to not detected (U) at the calculated detection limit. In order to be positively identified, the data must comply with the criteria listed in 9.7, 9.8, and 9.9.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

	YES	NO	N/A

10.0 Tentatively Identified Compounds (TIC)

NO TICs

10.1 If Tentatively Identified Compounds were required for this project, are all Form Is, Part B present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier?

NOTE: Review sampling reports to determine if the lab was required to identify non target analytes (refer to section 7.6.2,page 8270D-21).

	YES	NO	N/A
10.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:	[ ]	___	✓
a. Samples and/or fractions as appropriate	[ ]	___	✓
b. Blanks	[ ]	___	✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by CAS #.

	YES	NO	N/A
10.3 Are any target compounds from one fraction listed as TIC compounds in another (e.g., an acid compound listed as a base neutral TIC)?	___	[ ]	✓

ACTION: i. Flag with "R" any target compound listed as a TIC.

ii. Make sure all rejected compounds are properly reported in the other fraction.

10.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the

	YES	NO	N/A
sample mass spectrum?	[ ]	___	✓
10.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%?	[ ]	___	✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate and remove "JN". Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R."

11.0 Compound Quantitation and Reported Detection Limits

	YES	NO	N/A
11.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I result. Were any errors found?	___	[✓]	___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

	YES	NO	N/A
11.2 Are the method detection limits adjusted to reflect sample dilutions and, for soils, sample moisture?	[✓]	___	___

YES NO N/A

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC exceedance dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original Form I (if present) and substituting the data from the analysis of the diluted sample. Specify which Form I is to be used, then draw a red " X" across the entire page of all Form I's that should not be used, including any in the summary package.

12.0 Standards Data (GC/MS)

12.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant, Reports) present for initial and continuing calibration? [✓] ___ ___

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

13.0 GC/MS Initial Calibration (Form VI/Equivalent)

13.1 Is the Initial Calibration Form (Form VI/ Equivalent) present and complete for the semivolatile fraction? [✓] ___ ___

ACTION: If any calibration forms or standard row data are missing, take action specified in 3.2 above.

13.2 Are all base neutral or acid RRFs > 0.050? [✓] ___ ___

YES NO N/A

Check the **average RRFs** of the four System Performance Check Compounds (SPCCs): N-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, and 4-nitrophenol. These compounds must have **average RRFs** greater than or equal to 0.05 before running samples and should not show any peak tailing.

ACTION: Circle all outliers in red.

ACTION: For any target analyte with **average RRF <0.05**

1. "R" all non-detects;

2. "J" all positive results.

13.3 Are response factors for base neutral or acid target analytes stable over the concentration range of the calibration (% Relative standard deviation [%RSD] < 20.0%)? [✓] ___ ___

NOTE: The % RSD for each individual Calibration Check Compound (CCC, Method 8270D-40 see Table 4) must be less than 30% before analysis can begin. If grater 30%, the lab must clean and recalibrate the instrument.

CALIBRATION CHECK COMPOUNDS

Base/Neutral Fraction	Acid Fraction
Acenaphthene	4-Chloro-3-methylphenol
1,4-Dichlorobenzene	2,4-Dichlorophenol
Hexachlorobutadiene	2-Nitrophenol
Diphenylamine	Phenol
Di-n-octyl phthalate	Pentachlorophenol
Fluoranthene	2,4,6-Trichlorophenol

YES NO N/A

Benzo(a)pyrene

ACTION: If the %RSD for any CCC >30% and no corrective action taken, then "J" qualify all positive hits and "UJ" qualify all non-detects.

ACTION: Circle all outliers in red.

ACTION: If the % RSD is ≥ 20.0%, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, flag all non- detect results for that analyte "R," unusable. Alternatively, the lab should calculate first or second order regression fit of the calibration curve and select the fit which introduces the least amount of error.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

13.4 Did the laboratory calculate the calibration curve by the least squares regression fit? ___ [✓] ___

13.5 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or % RSD? (Check at least two values but if errors are found, check more.) ___ [✓] ___

ACTION: Circle Errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and note errors in data assessments.

13.5 Do the target compounds for this SDG include Pesticides? [ ] ✓ ___

	YES	NO	N/A
13.6 If the pesticide compounds include DDT, was the percent breakdown of DDT to DDD and DDE greater than 20%?		[ ]	✓

ACTION: If DDT percent breakdown exceeds 20%:

i. Qualify all positive results for DDT with "J". If DDT was not detected, but DDD and DDE results are positive, qualify the quantitation limit for DDT as unusable, "R".

ii. Qualify all positive results for DDD and DDE as presumptively present at an approximate concentration "JN".

14.0 GC/MS Calibration Verification (Form VII/Equivalent)

	YES	NO	N/A
14.1 Are the Calibration Verification Forms (Form VII) present and complete for all compounds of interest?	✓		
14.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument?	✓		

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

_____

_____

_____

ACTION: If any forms are missing or no calibration verification standard has been analyzed within twelve hours of every sample analysis,

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA23913	Instrument:	OSVGCMS1
		Calibration:	1304084

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA23913-TUN1	1dr001.D	04/24/13 10:27
Cal Standard	AA23913-CAL6	1dr008.D	04/24/13 13:31
Cal Standard	AA23913-CAL7	1dr009.D	04/24/13 13:59
Cal Standard	AA23913-CAL8	1dr010.D	04/24/13 14:27
Cal Standard	AA23913-CAL9	1dr011.D	04/24/13 14:55
Cal Standard	AA23913-CALA	1dr012.D	04/24/13 15:23
Cal Standard	AA23913-CALB	1dr013.D	04/24/13 15:51
Secondary Cal Check	AA23913-SCV2	1dr014.D	04/24/13 16:20
Cal Standard	AA23913-CALC	1dr015.D	04/24/13 16:48
Cal Standard	AA23913-CALD	1dr016.D	04/24/13 17:16
Cal Standard	AA23913-CALE	1dr017.D	04/24/13 17:44
Cal Standard	AA23913-CALF	1dr018.D	04/24/13 18:12
Cal Standard	AA23913-CALG	1dr019.D	04/24/13 18:41
Cal Standard	AA23913-CALH	1dr020.D	04/24/13 19:09
Cal Standard	AA23913-CALI	1dr021.D	04/24/13 19:37
Cal Standard	AA23913-CALJ	1dr022.D	04/24/13 20:05
Secondary Cal Check	AA23913-SCV3	1dr023.D	04/24/13 20:33

All samples

INITIAL CALIBRATION DATA (Continued)

EPA 8270D

Laboratory: ENCO Orlando

SDG: A302857-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Calibration: 1304084

Instrument: OSVGCMS1

Matrix: Water

Calibration Date: 04/25/13 14:38

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
4-Chloroaniline	0.420784	10.81733	8.596875	0.1299278			15	
4-Chloroaniline	0.420784	10.81733	8.596875	0.1299278			15	
Hexachlorobutadiene	0.133537	11.14084	8.696125	3.570073E-02			CCC (30)	
Hexachlorobutadiene	0.133537	11.14084	8.696125	3.570073E-02			CCC (30)	
Caprolactam	0.1023145	7.930677	9.0035	0.2410231	0.9997362		0.995	
Caprolactam	0.1023145	7.930677	9.0035	0.2410231	0.9997362		0.995	
4-Chloro-3-methylphenol	0.2875731	5.662493	9.173125	0.1065105			CCC (30)	
4-Chloro-3-methylphenol	0.2875731	5.662493	9.173125	0.1065105			CCC (30)	
Hexachlorocyclopentadiene	0.160971	3.91213	9.6115	5.126929E-02			SPCC (0.05)	
Hexachlorocyclopentadiene	0.160971	3.91213	9.6115	5.126929E-02			SPCC (0.05)	
1,2,4,5-Tetrachlorobenzene	0.5777248	12.52696	9.624429	6.801648E-02			15	
1,2,4,5-Tetrachlorobenzene	0.5777248	12.52696	9.624429	6.801648E-02			15	
2,4,6-Trichlorophenol	0.3906062	2.717846	9.7515	5.009164E-02			CCC (30)	
2,4,6-Trichlorophenol	0.3906062	2.717846	9.7515	5.009164E-02			CCC (30)	
2,4,5-Trichlorophenol	0.4048454	6.596888	9.796625	0.1011245			15	
2,4,5-Trichlorophenol	0.4048454	6.596888	9.796625	0.1011245			15	
1,1'-Biphenyl	1.408911	14.49249	9.982667	4.906209E-02			15	
1,1'-Biphenyl	1.408911	14.49249	9.982667	4.906209E-02			15	
2-Nitroaniline	0.2872128	6.284036	10.13212	9.884085E-02			15	
2-Nitroaniline	0.2872128	6.284036	10.13212	9.884085E-02			15	
Dimethylphthalate	1.380391	6.878142	10.346	0.1170416			15	
Dimethylphthalate	1.380391	6.878142	10.346	0.1170416			15	
2,6-Dinitrotoluene	0.321366	5.339978	10.42987	0.1170326			15	
2,6-Dinitrotoluene	0.321366	5.339978	10.42987	0.1170326			15	
3-Nitroaniline	0.2941958	9.995937	10.6465	0.1019011			15	
3-Nitroaniline	0.2941958	9.995937	10.6465	0.1019011			15	
2,4-Dinitrophenol	0.1094045	37.65892	10.77271	0.1071948	J/UJ	0.9956609	SPCC (0.05)	
2,4-Dinitrophenol	0.1094045	37.65892	10.77271	0.1071948		0.9956609	SPCC (0.05)	
4-Nitrophenol	0.1206959	13.08687	10.83529	0.1667762			SPCC (0.05)	
4-Nitrophenol	0.1206959	13.08687	10.83529	0.1667762			SPCC (0.05)	
Dibenzofuran	1.550377	12.47786	10.98488	6.975772E-02			15	
Dibenzofuran	1.550377	12.47786	10.98488	6.975772E-02			15	

INITIAL CALIBRATION DATA (Continued)

EPA 8270D

Laboratory: ENCO Orlando

SDG: A302857-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Calibration: 1304084

Instrument: OSVGCMS1

Matrix: Soil

Calibration Date: 04/25/13 14:38

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
2,4-Dinitrotoluene	0.3453686	11.07432	10.9405	0.1387042			15	
2,4-Dinitrotoluene	0.3453686	11.07432	10.9405	0.1387042			15	
2,3,4,6-Tetrachlorophenol	0.2947519	7.254076	11.1305	4.339181E-02			15	
2,3,4,6-Tetrachlorophenol	0.2947519	7.254076	11.1305	4.339181E-02			15	
Diethylphthalate	1.313816	11.00762	11.22375	9.913253E-02			15	
Diethylphthalate	1.313816	11.00762	11.22375	9.913253E-02			15	
4-Chlorophenyl-phenylether	0.6288451	10.68041	11.3905	6.295195E-02			15	
4-Chlorophenyl-phenylether	0.6288451	10.68041	11.3905	6.295195E-02			15	
4-Nitroaniline	0.2551348	8.570398	11.42925	0.1868726			15	
4-Nitroaniline	0.2551348	8.570398	11.42925	0.1868726			15	
2-Methyl-4,6-dinitrophenol	0.1790558	30.22664	11.458	0.1193095	J/UJ	0.9979228	0.99	
2-Methyl-4,6-dinitrophenol	0.1790558	30.22664	11.458	0.1193095		0.9979228	0.99	
N-nitrosodiphenylamine/Diphenylamine	0.9340443	13.85035	11.53729	0.0993536			15	
N-nitrosodiphenylamine/Diphenylamine	0.9340443	13.85035	11.53729	0.0993536			15	
4-Bromophenyl-phenylether	0.2478567	7.341758	12.01163	0.0391537			15	
4-Bromophenyl-phenylether	0.2478567	7.341758	12.01163	0.0391537			15	
Hexachlorobenzene	0.2677796	14.31915	12.12487	6.982579E-02			15	
Hexachlorobenzene	0.2677796	14.31915	12.12487	6.982579E-02			15	
Atrazine	0.3543928	5.458518	12.18083	7.041725E-02			15	
Atrazine	0.3543928	5.458518	12.18083	7.041725E-02			15	
Pentachlorophenol	0.1386658	10.69653	12.3585	7.961759E-02			CCC (30)	
Pentachlorophenol	0.1386658	10.69653	12.3585	7.961759E-02			CCC (30)	
Carbazole	0.9210803	8.251612	12.881	4.871411E-02			15	
Carbazole	0.9210803	8.251612	12.881	4.871411E-02			15	
Di-n-butylphthalate	1.318872	14.38763	13.26286	4.735941E-02			15	
Di-n-butylphthalate	1.318872	14.38763	13.26286	4.735941E-02			15	
Butylbenzylphthalate	0.3370092	6.03829	15.19925	3.254494E-02			15	
Butylbenzylphthalate	0.3370092	6.03829	15.19925	3.254494E-02			15	
3,3'-Dichlorobenzidine	0.3430223	6.014244	16.1015	3.503599E-02			15	
3,3'-Dichlorobenzidine	0.3430223	6.014244	16.1015	3.503599E-02			15	
Bis(2-ethylhexyl)phthalate	0.7507349	8.731109	16.107	1.481631E-02			15	
Bis(2-ethylhexyl)phthalate	0.7507349	8.731109	16.107	1.481631E-02			15	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24398	Instrument:	OSVGCMS1
		Calibration:	1304084

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA24398-TUN1	1f3001.D	06/03/13 09:36
Calibration Check	AA24398-CCV1	1f3002.D	06/03/13 09:49
Calibration Check	AA24398-CCV2	1f3003.D	06/03/13 10:17
Instrument RL Check	AA24398-CRL1	1f3004.D	06/03/13 10:46
Blank	3E22007-BLK1	1f3005.D	06/03/13 11:14
LCS	3E22007-BS1	1f3006.D	06/03/13 11:42
Veno-SD02-000H	3E22007-MS1	1f3007.D	06/03/13 12:11
Veno-SD02-000H	3E22007-MSD1	1f3008.D	06/03/13 12:39
Veno-SD11-000H	A302857-01	1f3016.D	06/03/13 16:29
Veno-SD11-0H01	A302857-02	1f3017.D	06/03/13 16:58
Veno-SD10-000H	A302857-03	1f3018.D	06/03/13 17:26
Veno-SD08-000H	A302857-04	1f3019.D	06/03/13 17:55
~~Veno-SD09-000H~~	A302857-05	1f3020.D	06/03/13 18:23

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1f3002.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24398	Injection Date:	06/03/13
Lab Sample ID:	AA24398-CCV1	Injection Time:	09:49

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Phenol	A	50.0	47	1.689286	1.605678		-4.9	20
Bis(2-chloroethyl)ether	A	50.0	46	1.321272	1.238048		-6.3	20
2-Chlorophenol	A	50.0	49	1.533498	1.49972		-2.2	20
2-Methylphenol	A	50.0	47	1.193165	1.114891		-6.6	20
Bis(2-chloroisopropyl)ether	A	50.0	47	2.116017	2.003114		-5.3	20
Acetophenone	A	50.0	44	1.88376	1.685536		-10.5	20
3 & 4-Methylphenol	Q	100	93	1.201132	1.005152		-6.6	20
N-Nitroso-di-n-propylamine	A	50.0	46	0.8771514	0.831172	0.05	-5.2	20
Hexachloroethane	A	50.0	51	0.6637878	0.6870651		3.5	20
Nitrobenzene	A	50.0	53	0.3702381	0.3898397		5.3	20
Isophorone	A	50.0	47	0.6814322	0.6450938		-5.3	20
2-Nitrophenol	A	50.0	51	0.1975773	0.1991617		0.8	20
2,4-Dimethylphenol	A	50.0	46	0.3606494	0.3317925		-8.0	20
Bis(2-chloroethoxy)methane	A	50.0	56	0.4863715	0.525957		8.1	20
2,4-Dichlorophenol	A	50.0	47	0.3146341	0.2941624		-6.5	20
4-Chloroaniline	A	50.0	48	0.420784	0.4058986		-3.5	20
Hexachlorobutadiene	A	50.0	52	0.133537	0.1386822		3.9	20
4-Chloro-3-methylphenol	A	50.0	50	0.2875731	0.2912282		1.3	20
Hexachlorocyclopentadiene	A	50.0	46	0.160971	0.1469257	0.05	-8.7	20
1,2,4,5-Tetrachlorobenzene	A	50.0	51	0.5777248	0.5941719		2.8	20
2,4,6-Trichlorophenol	A	50.0	49	0.3906062	0.3830367		-1.9	20
2,4,5-Trichlorophenol	A	50.0	50	0.4048454	0.4084489		0.9	20
2-Nitroaniline	A	50.0	59	0.2872128	0.3393129		18.1	20
Dimethylphthalate	A	50.0	50	1.380391	1.389091		0.6	20
2,6-Dinitrotoluene	A	50.0	49	0.321366	0.3157428		-1.7	20
3-Nitroaniline	A	50.0	56	0.2941958	0.3298385		12.1	20
2,4-Dinitrophenol	Q	50.0	63	0.1094045	0.1891839	0.05	26.9	20 *
4-Nitrophenol	A	50.0	69	0.1206959	0.1716166	0.05	42.2	20 *
Dibenzofuran	A	50.0	51	1.550377	1.577133		1.7	20

J/UJ

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1f3002.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24398	Injection Date:	06/03/13
Lab Sample ID:	AA24398-CCV1	Injection Time:	09:49

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
2,4-Dinitrotoluene	A	50.0	60	0.3453686	0.4193774		21.4	20 *	J/UJ
2,3,4,6-Tetrachlorophenol	A	50.0	55	0.2947519	0.3254578		10.4	20	
Diethylphthalate	A	50.0	52	1.313816	1.367474		4.1	20	
4-Chlorophenyl-phenylether	A	50.0	50	0.6288451	0.6264092		-0.4	20	
4-Nitroaniline	A	50.0	63	0.2551348	0.326343		27.9	20 *	J/UJ
2-Methyl-4,6-dinitrophenol	Q	50.0	54	0.1790558	0.2571171		8.2	20	
N-nitrosodiphenylamine/Diphenylam	A	100	100	0.9340443	0.9848232		5.4	20	
4-Bromophenyl-phenylether	A	50.0	46	0.2478567	0.2295137		-7.4	20	
Hexachlorobenzene	A	50.0	45	0.2677796	0.2408662		-10.1	20	
Pentachlorophenol	A	50.0	56	0.1386658	0.1569705		13.2	20	
Carbazole	A	50.0	53	0.9210803	0.9859446		7.0	20	
Di-n-butylphthalate	A	50.0	47	1.318872	1.254951		-4.8	20	
Butylbenzylphthalate	A	50.0	60	0.3370092	0.4091973		21.4	20 *	J/UJ
3,3'-Dichlorobenzidine	A	50.0	53	0.3430223	0.3645568		6.3	20	
Bis(2-ethylhexyl)phthalate	A	50.0	52	0.7507349	0.7855493		4.6	20	
Di-n-octylphthalate	Q	50.0	53	1.026902	1.300694		6.7	20	

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24423	Instrument:	OSVGCMS1
		Calibration:	1304084

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA24423-TUN1	1f5001.D	06/05/13 11:02
Calibration Check	AA24423-CCV2	1f5002.D	06/05/13 11:16
Calibration Check	AA24423-CCV1	1f5003.D	06/05/13 11:44
Instrument RL Check	AA24423-CRL1	1f5004.D	06/05/13 12:13
Blank	3E22001-BLK1	1f5005.D	06/05/13 12:41
LCS	3E22001-BS1	1f5006.D	06/05/13 13:09
LCS Dup	3E22001-BSD1	1f5007.D	06/05/13 13:38
Veno-EB01-051613-SD	A302857-07	1f5009.D	06/05/13 14:34

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1f5003.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24423	Injection Date:	06/05/13
Lab Sample ID:	AA24423-CCV1	Injection Time:	11:44

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Phenol	A	50.0	48	1.689286	1.617159		-4.3	20
Bis(2-chloroethyl)ether	A	50.0	48	1.321272	1.300908		-1.5	20
2-Chlorophenol	A	50.0	51	1.533498	1.552941		1.3	20
2-Methylphenol	A	50.0	50	1.193165	1.193457		0.02	20
Bis(2-chloroisopropyl)ether	A	50.0	50	2.116017	2.12146		0.3	20
Acetophenone	A	50.0	46	1.88376	1.74886		-7.2	20
3 & 4-Methylphenol	Q	100	97	1.201132	1.03333		-2.6	20
N-Nitroso-di-n-propylamine	A	50.0	50	0.8771514	0.8953231	0.05	2.1	20
Hexachloroethane	A	50.0	53	0.6637878	0.7037441		6.0	20
Nitrobenzene	A	50.0	52	0.3702381	0.3868131		4.5	20
Isophorone	A	50.0	52	0.6814322	0.7156853		5.0	20
2-Nitrophenol	A	50.0	51	0.1975773	0.1995943		1.0	20
2,4-Dimethylphenol	A	50.0	47	0.3606494	0.3388591		-6.0	20
Bis(2-chloroethoxy)methane	A	50.0	58	0.4863715	0.5421676		11.5	20
2,4-Dichlorophenol	A	50.0	48	0.3146341	0.3041436		-3.3	20
4-Chloroaniline	A	50.0	50	0.420784	0.4230471		0.5	20
Hexachlorobutadiene	A	50.0	51	0.133537	0.1358111		1.7	20
4-Chloro-3-methylphenol	A	50.0	57	0.2875731	0.3264283		13.5	20
Hexachlorocyclopentadiene	A	50.0	43	0.160971	0.1367276	0.05	-15.1	20
1,2,4,5-Tetrachlorobenzene	A	50.0	50	0.5777248	0.5839634		1.1	20
2,4,6-Trichlorophenol	A	50.0	51	0.3906062	0.3951695		1.2	20
2,4,5-Trichlorophenol	A	50.0	50	0.4048454	0.4031567		-0.4	20
2-Nitroaniline	A	50.0	59	0.2872128	0.3397253		18.3	20
Dimethylphthalate	A	50.0	49	1.380391	1.370197		-0.7	20
2,6-Dinitrotoluene	A	50.0	48	0.321366	0.3080651		-4.1	20
3-Nitroaniline	A	50.0	52	0.2941958	0.3090914		5.1	20
2,4-Dinitrophenol	Q	50.0	56	0.1094045	0.1677564	0.05	12.9	20
4-Nitrophenol	A	50.0	60	0.1206959	0.1497185	0.05	24.0	20 *
Dibenzofuran	A	50.0	51	1.550377	1.577133		1.7	20

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1f5003.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24423	Injection Date:	06/05/13
Lab Sample ID:	AA24423-CCV1	Injection Time:	11:44

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
2,4-Dinitrotoluene	A	50.0	54	0.3453686	0.3773141		9.2	20
2,3,4,6-Tetrachlorophenol	A	50.0	53	0.2947519	0.3138181		6.5	20
Diethylphthalate	A	50.0	48	1.313816	1.278421		-2.7	20
4-Chlorophenyl-phenylether	A	50.0	53	0.6288451	0.667005		6.1	20
4-Nitroaniline	A	50.0	55	0.2551348	0.2838535		11.3	20
2-Methyl-4,6-dinitrophenol	Q	50.0	47	0.1790558	0.2181885		-5.9	20
N-nitrosodiphenylamine/Diphenylam	A	100	99	0.9340443	0.9317645		-0.2	20
4-Bromophenyl-phenylether	A	50.0	50	0.2478567	0.2462324		-0.7	20
Hexachlorobenzene	A	50.0	52	0.2677796	0.279425		4.3	20
Pentachlorophenol	A	50.0	53	0.1386658	0.1506073		8.6	20
Carbazole	A	50.0	50	0.9210803	0.9237331		0.3	20
Di-n-butylphthalate	A	50.0	45	1.318872	1.213567		-8.0	20
Butylbenzylphthalate	A	50.0	51	0.3370092	0.3469804		3.0	20
3,3'-Dichlorobenzidine	A	50.0	51	0.3430223	0.3517633		2.5	20
Bis(2-ethylhexyl)phthalate	A	50.0	52	0.7507349	0.7907036		5.3	20
Di-n-octylphthalate	Q	50.0	49	1.026902	1.192878		-2.5	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24468	Instrument:	OSVGCMS1
		Calibration:	1304084

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA24468-TUN1	1fe001.D	06/10/13 10:14
Calibration Check	AA24468-CCV1	1fe002.D	06/10/13 10:28
Calibration Check	AA24468-CCV2	1fe003.D	06/10/13 11:25
Instrument RL Check	AA24468-CRL1	1fe004.D	06/10/13 11:53
Blank	3F06021-BLK1	1fe013.D	06/10/13 16:38
LCS	3F06021-BS1	1fe014.D	06/10/13 17:06
LCS Dup	3F06021-BSD1	1fe015.D	06/10/13 17:35
Veno-SD09-000H RE	A302857-05RE1	1fe017.D	06/10/13 18:33

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1fe002.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24468	Injection Date:	06/10/13
Lab Sample ID:	AA24468-CCV1	Injection Time:	10:28

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Phenol	A	50.0	50	1.689286	1.676699		-0.7	20
Bis(2-chloroethyl)ether	A	50.0	50	1.321272	1.348793		2.1	20
2-Chlorophenol	A	50.0	53	1.533498	1.623502		5.9	20
2-Methylphenol	A	50.0	51	1.193165	1.223194		2.5	20
Bis(2-chloroisopropyl)ether	A	50.0	49	2.116017	2.08872		-1.3	20
Acetophenone	A	50.0	48	1.88376	1.823158		-3.2	20
3 & 4-Methylphenol	Q	100	110	1.201132	1.116428		10.0	20
N-Nitroso-di-n-propylamine	A	50.0	48	0.8771514	0.8640592	0.05	-1.5	20
Hexachloroethane	A	50.0	54	0.6637878	0.7150569		7.7	20
Nitrobenzene	A	50.0	53	0.3702381	0.3958845		6.9	20
Isophorone	A	50.0	50	0.6814322	0.6819915		0.08	20
2-Nitrophenol	A	50.0	53	0.1975773	0.2091639		5.9	20
2,4-Dimethylphenol	A	50.0	48	0.3606494	0.3493353		-3.1	20
Bis(2-chloroethoxy)methane	A	50.0	58	0.4863715	0.5425963		11.6	20
2,4-Dichlorophenol	A	50.0	50	0.3146341	0.3110463		-1.1	20
4-Chloroaniline	A	50.0	51	0.420784	0.4254935		1.1	20
Hexachlorobutadiene	A	50.0	51	0.133537	0.137003		2.6	20
4-Chloro-3-methylphenol	A	50.0	54	0.2875731	0.3107002		8.0	20
Hexachlorocyclopentadiene	A	50.0	44	0.160971	0.1411043	0.05	-12.3	20
1,2,4,5-Tetrachlorobenzene	A	50.0	52	0.5777248	0.5987072		3.6	20
2,4,6-Trichlorophenol	A	50.0	50	0.3906062	0.391		0.1	20
2,4,5-Trichlorophenol	A	50.0	50	0.4048454	0.4047181		-0.03	20
2-Nitroaniline	A	50.0	58	0.2872128	0.3384649		17.8	20
Dimethylphthalate	A	50.0	49	1.380391	1.36033		-1.5	20
2,6-Dinitrotoluene	A	50.0	49	0.321366	0.3155483		-1.8	20
3-Nitroaniline	A	50.0	53	0.2941958	0.3119498		6.0	20
2,4-Dinitrophenol	Q	50.0	55	0.1094045	0.1636498	0.05	10.2	20
4-Nitrophenol	A	50.0	70	0.1206959	0.1727453	0.05	43.1	20 * JNJ
Dibenzofuran	A	50.0	50	1.550377	1.558624		0.5	20

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1fe002.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24468	Injection Date:	06/10/13
Lab Sample ID:	AA24468-CCV1	Injection Time:	10:28

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
2,4-Dinitrotoluene	A	50.0	57	0.3453686	0.4003286		15.9	20
2,3,4,6-Tetrachlorophenol	A	50.0	53	0.2947519	0.3163824		7.3	20
Diethylphthalate	A	50.0	50	1.313816	1.322216		0.6	20
4-Chlorophenyl-phenylether	A	50.0	51	0.6288451	0.6484395		3.1	20
4-Nitroaniline	A	50.0	61	0.2551348	0.3143032		23.2	20 *
2-Methyl-4,6-dinitrophenol	Q	50.0	48	0.1790558	0.2256932		-3.2	20
N-nitrosodiphenylamine/Diphenylam	A	100	100	0.9340443	0.9607244		2.9	20
4-Bromophenyl-phenylether	A	50.0	47	0.2478567	0.2357128		-4.9	20
Hexachlorobenzene	A	50.0	48	0.2677796	0.2558145		-4.5	20
Pentachlorophenol	A	50.0	51	0.1386658	0.1442912		4.1	20
Carbazole	A	50.0	51	0.9210803	0.9436196		2.4	20
Di-n-butylphthalate	A	50.0	46	1.318872	1.220289		-7.5	20
Butylbenzylphthalate	A	50.0	52	0.3370092	0.3583426		6.3	20
3,3'-Dichlorobenzidine	A	50.0	56	0.3430223	0.3862984		12.6	20
Bis(2-ethylhexyl)phthalate	A	50.0	52	0.7507349	0.7825499		4.2	20
Di-n-octylphthalate	Q	50.0	53	1.026902	1.293829		6.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

	YES	NO	N/A
call lab for explanation/resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable ("R").			
14.3 Do any of the SPCCs have an RRF <0.05?		✓	
If YES, make a note in data assessment if the lab did not take corrective action specified in section 7.4.4, page 8270D-18.		✓	
14.4 Do any of the CCCs have a %D between the initial and continuing RRF which exceeds 20.0%?			
ACTION: If yes, make a note in data assessment.			
14.5 Do any semivolatile compounds have a % Difference (% D) between the initial and continuing RRF which exceeds 20.0%?	✓		
ACTION: Circle all outliers in red.			
ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated (J). When %D is above 90%, qualify all non-detects for that analyte as "R", unusable.			
14.6 Do any semivolatile compounds have a RRF < 0.05?		✓	
ACTION: Circle all outliers in red.			
ACTION: If RRF < 0.05, qualify as unusable ("R") associated non-detects and "J" associated positive values.			
14.7 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or percent difference (%D) between initial and continuing RRFs? (Check at least two values but if errors are found, check more).		✓	

YES NO N/A

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect(s) in the data assessments.

15.0 Internal Standards (Form VIII)

15.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits (-50% to + 100%) for each continuing calibration? ✓ ___ ___

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area	LowerLimit	Upper Limit

(Attach additional sheets if necessary.)

Note: Check Table 5, 8270D-41 for associated analytes.

ACTION: i. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results and non-detects (U values) quantitated with this internal standard.

ii. Non-detects associated with IS > 100% should not be qualified.

	YES	NO	N/A
iii. If the IS area is below the lower limit (<50%), qualify all associated non-detects (U-values) "J". If extremely low area counts are reported (<25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable (R).			
15.2 Are the retention times of all internal standards within 30 seconds of the associated calibration standard?	✓		

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

16.0 Laboratory Control Samples (LCS)

	YES	NO	N/A
16.1 Were any LCS samples run in order to verify analytes which failed criteria for spike recovery?	✓		
16.2 Did the lab spike LCS sample spiked with the same analytes and the same concentrations as the matrix spike?	✓		
16.3 Were the mean and standard deviation of all analytes within the QC acceptance ranges as shown in Table 6, 8270D-43?		✓	

ACTION: If the recovery of any analyte falls out of the designated range, the analytical results for that compound is suspect and should be qualified "J" in the unspiked samples.

See attached forms - no qual

17.0 Field Duplicates

	YES	NO	N/A
17.1 Were any field duplicates submitted for semivolatile analysis?		✓	

PREPARATION BATCH SUMMARY

EPA 8270D

Laboratory: ENCO Orlando SDG: A302857-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Batch: 3E22001 Batch Matrix: Water Preparation: EPA 3510C MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	3E22001-BLK1	1f5005.D	05/22/13 01:30	
LCS	3E22001-BS1	1f5006.D	05/22/13 01:30	
LCS Dup	3E22001-BSD1	1f5007.D	05/22/13 01:30	
Veno-EB01-051613-SD	A302857-07	1f5009.D	05/22/13 01:30	

high rec - no ⊕ in sample, no qual

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Water		
Batch:	3E22001	Laboratory ID:	3E22001-BS1
Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Benzaldehyde	50.0	44	87	43 - 87
Phenol	50.0	18	37	0 - 115
Bis(2-chloroethyl)ether	50.0	46	91	35 - 110
2-Chlorophenol	50.0	39	79	35 - 105
2-Methylphenol	50.0	34	68	40 - 110
Bis(2-chloroisopropyl)ether	50.0	41	82	25 - 130
Acetophenone	50.0	42	83	41 - 92
3 & 4-Methylphenol	50.0	31	63	30 - 110
N-Nitroso-di-n-propylamine	50.0	52	103	35 - 130
Hexachloroethane	50.0	24	49	30 - 100
Nitrobenzene	50.0	42	84	45 - 110
Isophorone	50.0	46	92	50 - 110
2-Nitrophenol	50.0	41	82	40 - 115
2,4-Dimethylphenol	50.0	37	73	30 - 110
Bis(2-chloroethoxy)methane	50.0	36	73	45 - 105
2,4-Dichlorophenol	50.0	39	77	50 - 105
4-Chloroaniline	50.0	34	69	15 - 110
Hexachlorobutadiene	50.0	23	47	25 - 105
Caprolactam	50.0	15	30	10 - 51
4-Chloro-3-methylphenol	50.0	43	87	45 - 110
Hexachlorocyclopentadiene	50.0	22	43	10 - 117
1,2,4,5-Tetrachlorobenzene	50.0	26	53	24 - 69
2,4,6-Trichlorophenol	50.0	40	79	50 - 115
2,4,5-Trichlorophenol	50.0	40	81	50 - 110
1,1'-Biphenyl	50.0	35	70	46 - 83
2-Nitroaniline	50.0	50	100	50 - 115
Dimethylphthalate	50.0	37	75	25 - 125
2,6-Dinitrotoluene	50.0	44	88	50 - 115
3-Nitroaniline	50.0	46	91	20 - 125
2,4-Dinitrophenol	50.0	50	101	15 - 140

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Water		
Batch:	3E22001	Laboratory ID:	3E22001-BS1
Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
4-Nitrophenol	50.0	31	62	0 - 125
Dibenzofuran	50.0	39	77	55 - 105
2,4-Dinitrotoluene	50.0	57	113	50 - 120
2,3,4,6-Tetrachlorophenol	50.0	48	95 *	61 - 94
Diethylphthalate	50.0	47	95	40 - 120
4-Chlorophenyl-phenylether	50.0	43	86	50 - 110
4-Nitroaniline	50.0	58	116	35 - 120
2-Methyl-4,6-dinitrophenol	50.0	52	104	40 - 130
N-nitrosodiphenylamine/Diphenylamine	50.0	46	92	50 - 110
4-Bromophenyl-phenylether	50.0	39	78	50 - 115
Hexachlorobenzene	50.0	45	89	50 - 110
Atrazine	50.0	58	115 *	47 - 101
Pentachlorophenol	50.0	50	99	40 - 115
Carbazole	50.0	52	103	50 - 115
Di-n-butylphthalate	50.0	51	103	55 - 115
Butylbenzylphthalate	50.0	56	112	45 - 115
3,3'-Dichlorobenzidine	50.0	43	86	20 - 110
Bis(2-ethylhexyl)phthalate	50.0	58	116	40 - 125
Di-n-octylphthalate	50.0	51	102	35 - 135

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzaldehyde	50.0	39	78	11	30	43 - 87
Phenol	50.0	16	33	11	30	0 - 115
Bis(2-chloroethyl)ether	50.0	41	81	11	30	35 - 110
2-Chlorophenol	50.0	36	71	10	30	35 - 105
2-Methylphenol	50.0	31	61	11	30	40 - 110
Bis(2-chloroisopropyl)ether	50.0	36	72	12	30	25 - 130
Acetophenone	50.0	37	74	11	30	41 - 92
3 & 4-Methylphenol	50.0	27	55	14	30	30 - 110

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Water		
Batch:	3E22001	Laboratory ID:	3E22001-BSD1
Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
N-Nitroso-di-n-propylamine	50.0	45	90	14	30	35 - 130
Hexachloroethane	50.0	22	45	9	30	30 - 100
Nitrobenzene	50.0	38	76	11	30	45 - 110
Isophorone	50.0	41	82	12	30	50 - 110
2-Nitrophenol	50.0	39	77	6	30	40 - 115
2,4-Dimethylphenol	50.0	33	65	11	30	30 - 110
Bis(2-chloroethoxy)methane	50.0	33	65	11	30	45 - 105
2,4-Dichlorophenol	50.0	35	70	10	30	50 - 105
4-Chloroaniline	50.0	31	62	10	30	15 - 110
Hexachlorobutadiene	50.0	21	43	10	30	25 - 105
Caprolactam	50.0	13	27	12	30	10 - 51
4-Chloro-3-methylphenol	50.0	39	78	11	30	45 - 110
Hexachlorocyclopentadiene	50.0	20	40	7	30	10 - 117
1,2,4,5-Tetrachlorobenzene	50.0	24	48	9	30	24 - 69
2,4,6-Trichlorophenol	50.0	36	72	9	30	50 - 115
2,4,5-Trichlorophenol	50.0	37	73	9	30	50 - 110
1,1'-Biphenyl	50.0	32	63	10	30	46 - 83
2-Nitroaniline	50.0	46	91	9	30	50 - 115
Dimethylphthalate	50.0	34	68	10	30	25 - 125
2,6-Dinitrotoluene	50.0	39	79	11	30	50 - 115
3-Nitroaniline	50.0	42	83	9	30	20 - 125
2,4-Dinitrophenol	50.0	48	97	4	30	15 - 140
4-Nitrophenol	50.0	29	58	7	30	0 - 125
Dibenzofuran	50.0	35	70	10	30	55 - 105
2,4-Dinitrotoluene	50.0	52	103	9	30	50 - 120
2,3,4,6-Tetrachlorophenol	50.0	43	86	10	30	61 - 94
Diethylphthalate	50.0	43	87	9	30	40 - 120
4-Chlorophenyl-phenylether	50.0	38	77	11	30	50 - 110
4-Nitroaniline	50.0	54	107	8	30	35 - 120
2-Methyl-4,6-dinitrophenol	50.0	49	99	5	30	40 - 130

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Water		
Batch:	3E22001	Laboratory ID:	3E22001-BSD1
Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
N-nitrosodiphenylamine/Diphenylam	50.0	42	84	9	30	50 - 110
4-Bromophenyl-phenylether	50.0	34	68	13	30	50 - 115
Hexachlorobenzene	50.0	39	78	14	30	50 - 110
Atrazine	50.0	52	104 *	11	30	47 - 101
Pentachlorophenol	50.0	45	91	9	30	40 - 115
Carbazole	50.0	46	92	11	30	50 - 115
Di-n-butylphthalate	50.0	45	90	13	30	55 - 115
Butylbenzylphthalate	50.0	49	99	13	30	45 - 115
3,3'-Dichlorobenzidine	50.0	38	77	12	30	20 - 110
Bis(2-ethylhexyl)phthalate	50.0	52	104	10	30	40 - 125
Di-n-octylphthalate	50.0	46	93	10	30	35 - 135

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

EPA 8270D

Laboratory: ENCO Orlando SDG: A302857-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Batch: 3E22007 Batch Matrix: Soil Preparation: EPA 3550C_MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	3E22007-BLK1	1f3005.D	05/22/13 09:00	
LCS	3E22007-BS1	1f3006.D	05/22/13 09:00	
Veno-SD02-000H	3E22007-MS1	1f3007.D	05/22/13 09:00	
Veno-SD02-000H	3E22007-MSD1	1f3008.D	05/22/13 09:00	
Veno-SD11-000H	A302857-01	1f3016.D	05/22/13 09:00	
Veno-SD11-0H01	A302857-02	1f3017.D	05/22/13 09:00	
Veno-SD10-000H	A302857-03	1f3018.D	05/22/13 09:00	
Veno-SD08-000H	A302857-04	1f3019.D	05/22/13 09:00	
~~Veno-SD09-000H~~	A302857-05	1f3020.D	05/22/13 09:00	

High rec – no ⊕ in samples for this Compd, no qual

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E22007	Laboratory ID:	3E22007-BS1
Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	LCS % REC. #	QC LIMITS REC.
Benzaldehyde	1.67	1.2	73	45 - 99
Phenol	1.67	1.2	70	40 - 100
Bis(2-chloroethyl)ether	1.67	1.3	76	40 - 105
2-Chlorophenol	1.67	1.1	68	45 - 105
2-Methylphenol	1.67	1.1	65	40 - 105
Bis(2-chloroisopropyl)ether	1.67	1.2	73	20 - 115
Acetophenone	1.67	1.2	71	52 - 86
3 & 4-Methylphenol	1.67	1.2	72	40 - 105
N-Nitroso-di-n-propylamine	1.67	1.5	90	40 - 115
Hexachloroethane	1.67	1.2	70	35 - 110
Nitrobenzene	1.67	1.3	78	40 - 115
Isophorone	1.67	1.5	92	45 - 110
2-Nitrophenol	1.67	1.2	74	40 - 110
2,4-Dimethylphenol	1.67	1.1	65	30 - 105
Bis(2-chloroethoxy)methane	1.67	1.2	69	45 - 110
2,4-Dichlorophenol	1.67	1.2	75	45 - 110
4-Chloroaniline	1.67	0.94	57	10 - 100
Hexachlorobutadiene	1.67	1.2	74	40 - 115
Caprolactam	1.67	1.9	113	14 - 125
4-Chloro-3-methylphenol	1.67	1.5	92	45 - 115
Hexachlorocyclopentadiene	1.67	1.3	80	10 - 170
1,2,4,5-Tetrachlorobenzene	1.67	1.4	81	59 - 81
2,4,6-Trichlorophenol	1.67	1.4	84	45 - 110
2,4,5-Trichlorophenol	1.67	1.4	86	50 - 110
1,1'-Biphenyl	1.67	1.5	88	52 - 100
2-Nitroaniline	1.67	1.7	103	45 - 120
Dimethylphthalate	1.67	1.6	99	50 - 110
2,6-Dinitrotoluene	1.67	1.6	94	50 - 110
3-Nitroaniline	1.67	1.4	86	25 - 110
2,4-Dinitrophenol	1.67	0.99	59	15 - 130

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E22007	Laboratory ID:	3E22007-BS1
Preparation:	EPA 3550C MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	LCS % REC. #	QC LIMITS REC.
4-Nitrophenol	1.67	1.9	114	15 - 140
Dibenzofuran	1.67	1.5	91	50 - 105
2,4-Dinitrotoluene	1.67	1.9	113	50 - 115
2,3,4,6-Tetrachlorophenol	1.67	1.6	97	18 - 98
Diethylphthalate	1.67	1.8	106	50 - 115
4-Chlorophenyl-phenylether	1.67	1.6	95	45 - 110
4-Nitroaniline	1.67	1.5	92	35 - 115
2-Methyl-4,6-dinitrophenol	1.67	1.5	90	30 - 135
N-nitrosodiphenylamine/Diphenylamine	1.67	1.6	96	50 - 115
4-Bromophenyl-phenylether	1.67	1.5	90	45 - 115
Hexachlorobenzene	1.67	1.7	100	45 - 120
Atrazine	1.67	1.8	106	45 - 120
Pentachlorophenol	1.67	1.5	91	25 - 120
Carbazole	1.67	1.8	106	45 - 115
Di-n-butylphthalate	1.67	1.7	103	55 - 110
Butylbenzylphthalate	1.67	2.3	136 *	50 - 125
3,3'-Dichlorobenzidine	1.67	1.3	76	10 - 130
Bis(2-ethylhexyl)phthalate	1.67	1.9	115	45 - 125
Di-n-octylphthalate	1.67	1.9	112	40 - 130

J+

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

EPA 8270D

Laboratory: ENCO Orlando SDG: A302857-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Batch: 3F06021 Batch Matrix: Soil Preparation: EPA 3550C_MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	3F06021-BLK1	1fe013.D	06/07/13 09:45	
LCS	3F06021-BS1	1fe014.D	06/07/13 09:45	
LCS Dup	3F06021-BSD1	1fe015.D	06/07/13 09:45	
Veno-SD09-000H	A302857-05RE1	1fe017.D	06/07/13 09:45	

high rec - no ⊕ for this compd
in assoc sample, no final

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3F06021	Laboratory ID:	3F06021-BS1
Preparation:	EPA 3550C MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	LCS % REC. #	QC LIMITS REC.
Benzaldehyde	1.67	1.5	92	45 - 99
Phenol	1.67	1.4	86	40 - 100
Bis(2-chloroethyl)ether	1.67	1.5	92	40 - 105
2-Chlorophenol	1.67	1.4	84	45 - 105
2-Methylphenol	1.67	1.3	79	40 - 105
Bis(2-chloroisopropyl)ether	1.67	1.4	86	20 - 115
Acetophenone	1.67	1.4	86	52 - 86
3 & 4-Methylphenol	1.67	1.4	86	40 - 105
N-Nitroso-di-n-propylamine	1.67	1.7	102	40 - 115
Hexachloroethane	1.67	1.4	85	35 - 110
Nitrobenzene	1.67	1.5	88	40 - 115
Isophorone	1.67	1.5	92	45 - 110
2-Nitrophenol	1.67	1.4	87	40 - 110
2,4-Dimethylphenol	1.67	1.2	70	30 - 105
Bis(2-chloroethoxy)methane	1.67	1.3	75	45 - 110
2,4-Dichlorophenol	1.67	1.3	80	45 - 110
4-Chloroaniline	1.67	0.90	54	10 - 100
Hexachlorobutadiene	1.67	1.4	84	40 - 115
Caprolactam	1.67	1.7	104	14 - 125
4-Chloro-3-methylphenol	1.67	1.5	90	45 - 115
Hexachlorocyclopentadiene	1.67	1.5	91	10 - 170
1,2,4,5-Tetrachlorobenzene	1.67	1.5	89 *	59 - 81
2,4,6-Trichlorophenol	1.67	1.4	86	45 - 110
2,4,5-Trichlorophenol	1.67	1.4	84	50 - 110
1,1'-Biphenyl	1.67	1.5	92	52 - 100
2-Nitroaniline	1.67	1.7	100	45 - 120
Dimethylphthalate	1.67	1.5	90	50 - 110
2,6-Dinitrotoluene	1.67	1.4	86	50 - 110
3-Nitroaniline	1.67	1.3	79	25 - 110
2,4-Dinitrophenol	1.67	1.0	62	15 - 130

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3F06021	Laboratory ID:	3F06021-BS1
Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	LCS % REC. #	QC LIMITS REC.
4-Nitrophenol	1.67	1.9	114	15 - 140
Dibenzofuran	1.67	1.5	88	50 - 105
2,4-Dinitrotoluene	1.67	1.7	104	50 - 115
2,3,4,6-Tetrachlorophenol	1.67	1.5	92	18 - 98
Diethylphthalate	1.67	1.6	97	50 - 115
4-Chlorophenyl-phenylether	1.67	1.5	91	45 - 110
4-Nitroaniline	1.67	1.5	91	35 - 115
2-Methyl-4,6-dinitrophenol	1.67	1.5	90	30 - 135
N-nitrosodiphenylamine/Diphenylamine	1.67	1.5	87	50 - 115
4-Bromophenyl-phenylether	1.67	1.4	83	45 - 115
Hexachlorobenzene	1.67	1.5	88	45 - 120
Atrazine	1.67	1.7	104	45 - 120
Pentachlorophenol	1.67	1.3	76	25 - 120
Carbazole	1.67	1.5	88	45 - 115
Di-n-butylphthalate	1.67	1.6	97	55 - 110
Butylbenzylphthalate	1.67	1.8	110	50 - 125
3,3'-Dichlorobenzidine	1.67	1.3	75	10 - 130
Bis(2-ethylhexyl)phthalate	1.67	1.8	107	45 - 125
Di-n-octylphthalate	1.67	1.7	103	40 - 130

COMPOUND	SPIKE ADDED (mg/kg wet)	LCSD CONCENTRATION (mg/kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzaldehyde	1.67	1.5	93	2	30	45 - 99
Phenol	1.67	1.5	89	4	30	40 - 100
Bis(2-chloroethyl)ether	1.67	1.6	93	2	30	40 - 105
2-Chlorophenol	1.67	1.4	87	4	30	45 - 105
2-Methylphenol	1.67	1.4	82	4	30	40 - 105
Bis(2-chloroisopropyl)ether	1.67	1.4	86	0.4	30	20 - 115
Acetophenone	1.67	1.5	89 *	4	30	52 - 86
3 & 4-Methylphenol	1.67	1.4	86	0.09	30	40 - 105

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3F06021	Laboratory ID:	3F06021-BSD1
Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCSD CONCENTRATION (mg/kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
N-Nitroso-di-n-propylamine	1.67	1.7	102	0.5	30	40 - 115
Hexachloroethane	1.67	1.4	86	0.9	30	35 - 110
Nitrobenzene	1.67	1.5	89	2	30	40 - 115
Isophorone	1.67	1.5	91	1	30	45 - 110
2-Nitrophenol	1.67	1.5	90	4	30	40 - 110
2,4-Dimethylphenol	1.67	1.2	71	1	30	30 - 105
Bis(2-chloroethoxy)methane	1.67	1.3	75	0.3	30	45 - 110
2,4-Dichlorophenol	1.67	1.4	83	3	30	45 - 110
4-Chloroaniline	1.67	0.92	55	2	30	10 - 100
Hexachlorobutadiene	1.67	1.4	83	0.9	30	40 - 115
Caprolactam	1.67	1.8	109	5	30	14 - 125
4-Chloro-3-methylphenol	1.67	1.6	95	5	30	45 - 115
Hexachlorocyclopentadiene	1.67	1.7	101	10	30	10 - 170
1,2,4,5-Tetrachlorobenzene	1.67	1.5	88 *	0.4	30	59 - 81
2,4,6-Trichlorophenol	1.67	1.5	87	2	30	45 - 110
2,4,5-Trichlorophenol	1.67	1.5	88	4	30	50 - 110
1,1'-Biphenyl	1.67	1.5	92	0.6	30	52 - 100
2-Nitroaniline	1.67	1.8	108	8	30	45 - 120
Dimethylphthalate	1.67	1.5	90	0.04	30	50 - 110
2,6-Dinitrotoluene	1.67	1.5	87	1	30	50 - 110
3-Nitroaniline	1.67	1.4	83	5	30	25 - 110
2,4-Dinitrophenol	1.67	1.1	67	8	30	15 - 130
4-Nitrophenol	1.67	2.2	130	13	30	15 - 140
Dibenzofuran	1.67	1.5	90	3	30	50 - 105
2,4-Dinitrotoluene	1.67	1.8	107	3	30	50 - 115
2,3,4,6-Tetrachlorophenol	1.67	1.6	96	4	30	18 - 98
Diethylphthalate	1.67	1.6	98	0.6	30	50 - 115
4-Chlorophenyl-phenylether	1.67	1.5	93	2	30	45 - 110
4-Nitroaniline	1.67	1.7	102	11	30	35 - 115
2-Methyl-4,6-dinitrophenol	1.67	1.6	93	4	30	30 - 135

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3F06021	Laboratory ID:	3F06021-BSD1
Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCSD CONCENTRATION (mg/kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
N-nitrosodiphenylamine/Diphenylam	1.67	1.5	92	5	30	50 - 115
4-Bromophenyl-phenylether	1.67	1.4	82	1	30	45 - 115
Hexachlorobenzene	1.67	1.4	85	4	30	45 - 120
Atrazine	1.67	1.9	112	7	30	45 - 120
Pentachlorophenol	1.67	1.3	79	4	30	25 - 120
Carbazole	1.67	1.5	92	4	30	45 - 115
Di-n-butylphthalate	1.67	1.5	93	5	30	55 - 110
Butylbenzylphthalate	1.67	1.8	107	3	30	50 - 125
3,3'-Dichlorobenzidine	1.67	1.3	79	4	30	10 - 130
Bis(2-ethylhexyl)phthalate	1.67	1.8	106	0.7	30	45 - 125
Di-n-octylphthalate	1.67	1.8	106	3	30	40 - 130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Initial Calibration Date: 4/24/2013

RRF and %RSD Calculations:

Compound Name: phenol
Lab Value: 1.792

Area of Compound	312861
Area of Internal STD	349085
Conc. of Internal STD	40
Conc. of Compound	20
Calculated RRF	1.792

Compound Name: nitrobenzene
Lab Value: 8.77

RRF of STD 1	0.412
RRF of STD 2	0.3979607
RRF of STD 3	0.3934665
RRF of STD 4	0.3727513
RRF of STD 5	0.3725207
RRF of STD 6	0.3590465
RRF of STD 7	0.34256
RRF of STD 8	0.3116514
Calculated % RSD	8.77

Continuing Calibration File ID: 6/5/2013

RRF and %D Calculations:

Compound Name: 2-chlorophenol
Lab Value: 1.553

Area of Compound	900667
Area of Internal STD	463980
Conc. of Internal STD	40
Conc. of Compound	50
Calculated RRF	1.553

Compound Name: butylbenzylphthalate
Lab Value: 3.0

Average RRF	0.3370092
Calibration Check RRF	0.3469804
Calculated % D	-3.0

YES NO N/A

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

Sample VEN0-SD09-000H was RE due to low surr rec. The initial analy exhibited 10% and below for all surr. The sample was RE out of HT w/ 2 non-compl. rec; however these rec were ↑ 10%. Therefore the RE was used

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: _____ SDG# A302857
LAB: ENCO Labs SITE: Laguna La Chiva (Vieques)

1.0 Data Completeness and Deliverables	YES	NO	N/A
1.1 Has all the data been submitted in CLP deliverable format?	[ ]	X	
1.2 Have any missing deliverables been received and added to the data package?	[X]		

See report for details

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter, SDG Narrative			
2.1 Is a laboratory narrative or cover letter present?	[✓]		
2.2 Are the case number and/or SDG number contained in the narrative or cover letter?	[✓]		

3.0 Data Validation Checklist			
3.1 Does this data package contain:			
Water data? Rinse blank	[✓]		
Waste data?	[ ]		✓
Soil/solid data?	[✓]		

ORGANOCHLORINE PESTICIDE

YES NO N/A

1.0 Traffic Reports and Laboratory Narrative

1.1 Are traffic report and chain-of-custody forms present for all samples? [✓] ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? ✓ [ ] ___

ACTION: If any sample analyzed as a soil, other than than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, all non detects are qualified as unusable, "R", and positive results flagged "J".

3 samples with high % moisture - See next page

ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".

2.0 Holding Times

2.1 Have any organochlorine pesticide technical holding times, determined from date of collection to date of extraction, been exceeded? ✓ [ ] ___

RX of Veno-SD11-000H - not reported

Water and waste samples for organochlorine pesticide analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 302857

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	% Moisture
VENO-SD11-000H	57.61
VENO-SD08-000H	65.34
VENO-SD09-000H	57.16

HOLDING TIME SUMMARY

EPA 8081B

Laboratory: ENCO Orlando

SDG: A302857-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
Veno-SD11-000H	05/16/13 08:50	05/17/13 09:25	05/21/13 03:30	5.00	14.00	06/04/13 16:59	14.00	40.00	
Veno-SD11-000H RX	05/16/13 08:50	05/17/13 09:25	06/06/13 12:45	21.00	14.00	06/07/13 14:48	1.00	40.00	* not report
Veno-SD11-0H01	05/16/13 09:00	05/17/13 09:25	05/21/13 03:30	5.00	14.00	06/04/13 17:11	14.00	40.00	
Veno-SD10-000H	05/16/13 09:50	05/17/13 09:25	05/21/13 03:30	5.00	14.00	06/04/13 17:23	14.00	40.00	
Veno-SD08-000H	05/16/13 10:15	05/17/13 09:25	05/21/13 03:30	5.00	14.00	06/04/13 17:35	14.00	40.00	
Veno-SD09-000H	05/16/13 10:45	05/17/13 09:25	05/21/13 03:30	5.00	14.00	06/04/13 17:47	14.00	40.00	
Veno-EB01-051613-SD	05/16/13 06:45	05/17/13 09:25	05/20/13 13:30	4.00	7.00	06/04/13 14:09	15.00	40.00	

ACTION: Qualify sample results according to Table 1.

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 7 days (extraction) > 40 days (analysis)	J*	UJ
	Yes	≤ 7 days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days (extraction) >40 days (analysis)	J	UJ
	Yes	≤ 14days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 14days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

YES NO N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste [✓] ___ ___

b. Soil/Solid [✓] ___ ___

3.2 Are all the pesticide samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water [✓] ___ ___

b. Waste [ ] ___ [✓]

c. Soil/Solid [✓] ___ ___

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between ~~30-150%~~ for all samples, including MS and MSDs, LCSs and all blanks? [ ] [✓] ___

See Form II equivalents for flags

Note: Reviewer shall use lab in-house recover limits if available. In-house criteria should be examined for reasonableness.

ACTION: Circle all outliers in red. Follow surrogate action Table 2.

3.5 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? [✓] ___ ___

ACTION: Follow surrogate action, Table 2 below.

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory: ENCO Orlando
SDG: A302857-CTO0037
Client: CH2M Hill, Inc. (CH029)
Project: East Vieques La Chiva SWMU 1, CTO-0037

Sequence: AA24376
Instrument: OSVGCECD2
Matrix: Soil
Calibration: 1304047

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q	
Matrix Spike (3E21001-MS1)			Lab File ID: 2F4013.D		Analyzed: 06/04/13 12:33				
2,4,5,6-TCMX	0.0708	62	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	NG
2,4,5,6-TCMX	0.0708	62	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0708	59	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0708	59	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
Decachlorobiphenyl	0.0708	71	55 - 130	6.188	6.021	0.1670	+/-1.0		
Decachlorobiphenyl	0.0708	71	55 - 130	6.188	6.021	0.1670	+/-1.0		
Decachlorobiphenyl [2C]	0.0708	59	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Decachlorobiphenyl [2C]	0.0708	59	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Matrix Spike Dup (3E21001-MSD1)			Lab File ID: 2F4014.D		Analyzed: 06/04/13 12:45				
2,4,5,6-TCMX	0.0710	51	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	NQ
2,4,5,6-TCMX	0.0710	51	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0710	49	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0710	49	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
Decachlorobiphenyl	0.0710	64	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl	0.0710	64	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0710	53	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	NQ
Decachlorobiphenyl [2C]	0.0710	53	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	
Veno-EB01-051613-SD (A302857-07)			Lab File ID: 2F4021.D		Analyzed: 06/04/13 14:09				
2,4,5,6-TCMX	1.00	79	25 - 140	2.151	2.003333	0.1477	+/-1.0		
2,4,5,6-TCMX [2C]	1.00	72	25 - 140	2.034	1.894667	0.1393	+/-1.0		
Decachlorobiphenyl	1.00	78	30 - 135	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	1.00	69	30 - 135	6.253	6.089167	0.1638	+/-1.0		
Veno-SD11-000H (A302857-01)			Lab File ID: 2F4035.D		Analyzed: 06/04/13 16:59				
2,4,5,6-TCMX	0.0786	24	70 - 125	2.153	2.003333	0.1497	+/-1.0	*	J/ii
2,4,5,6-TCMX [2C]	0.0786	24	70 - 125	2.035	1.894667	0.1403	+/-1.0	*	
Decachlorobiphenyl	0.0786	67	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0786	58	55 - 130	6.252	6.089167	0.1628	+/-1.0		
Veno-SD11-0H01 (A302857-02)			Lab File ID: 2F4036.D		Analyzed: 06/04/13 17:11				
2,4,5,6-TCMX	0.0349	34	70 - 125	2.153	2.003333	0.1497	+/-1.0	*	J/ii
2,4,5,6-TCMX [2C]	0.0349	31	70 - 125	2.035	1.894667	0.1403	+/-1.0	*	
Decachlorobiphenyl	0.0349	62	55 - 130	6.19	6.021	0.1690	+/-1.0		
Decachlorobiphenyl [2C]	0.0349	52	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24376	Instrument:	OSVGCECD2
Matrix:	Water	Calibration:	1304047

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q	
Veno-SD10-000H (A302857-03)			Lab File ID: 2F4037.D		Analyzed: 06/04/13 17:23				
2,4,5,6-TCMX	0.0633	64	70 - 125	2.153	2.003333	0.1497	+/-1.0	*	JU
2,4,5,6-TCMX [2C]	0.0633	55	70 - 125	2.035	1.894667	0.1403	+/-1.0	*	↓
Decachlorobiphenyl	0.0633	67	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0633	55	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Veno-SD08-000H (A302857-04)			Lab File ID: 2F4038.D		Analyzed: 06/04/13 17:35				
2,4,5,6-TCMX	0.0955	57	70 - 125	2.153	2.003333	0.1497	+/-1.0	*	JU
2,4,5,6-TCMX [2C]	0.0955	54	70 - 125	2.035	1.894667	0.1403	+/-1.0	*	↓
Decachlorobiphenyl	0.0955	71	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0955	58	55 - 130	6.253	6.089167	0.1638	+/-1.0		
Veno-SD09-000H (A302857-05)			Lab File ID: 2F4039.D		Analyzed: 06/04/13 17:47				
2,4,5,6-TCMX	0.0770	69	70 - 125	2.152	2.003333	0.1487	+/-1.0	*	JU
2,4,5,6-TCMX [2C]	0.0770	62	70 - 125	2.035	1.894667	0.1403	+/-1.0	*	↓
Decachlorobiphenyl	0.0770	68	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0770	56	55 - 130	6.253	6.089167	0.1638	+/-1.0		

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24452	Instrument:	OSVGCECD2
Matrix:	Soil	Calibration:	1304047

Surrogate Compound	Spike Level ug/mL	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA24452-CCV1)			Lab File ID: 2FB003.D		Analyzed: 06/07/13 10:28			
2,4,5,6-TCMX	0.100	109	80 - 120	2.136	2.003333	0.1327	+/-1.0	
2,4,5,6-TCMX [2C]	0.100	111	80 - 120	2.011	1.894667	0.1163	+/-1.0	
Decachlorobiphenyl	0.100	106	80 - 120	6.165	6.021	0.1440	+/-1.0	
Decachlorobiphenyl [2C]	0.100	105	80 - 120	6.222	6.089167	0.1328	+/-1.0	
Blank (3F06020-BLK1)			Lab File ID: 2FB007.D		Analyzed: 06/07/13 11:05			
2,4,5,6-TCMX	0.0333	103	70 - 125	2.134	2.003333	0.1307	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	102	70 - 125	2.013	1.894667	0.1183	+/-1.0	
Decachlorobiphenyl	0.0333	100	55 - 130	6.164	6.021	0.1430	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	98	55 - 130	6.222	6.089167	0.1328	+/-1.0	
LCS (3F06020-BS1)			Lab File ID: 2FB008.D		Analyzed: 06/07/13 11:17			
2,4,5,6-TCMX	0.0333	101	70 - 125	2.129	2.003333	0.1257	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	112	70 - 125	2.009	1.894667	0.1143	+/-1.0	
Decachlorobiphenyl	0.0333	115	55 - 130	6.165	6.021	0.1440	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	114	55 - 130	6.224	6.089167	0.1348	+/-1.0	
LCS Dup (3F06020-BSD1)			Lab File ID: 2FB009.D		Analyzed: 06/07/13 11:29			
2,4,5,6-TCMX	0.0333	89	70 - 125	2.129	2.003333	0.1257	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	98	70 - 125	2.009	1.894667	0.1143	+/-1.0	
Decachlorobiphenyl	0.0333	101	55 - 130	6.164	6.021	0.1430	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	99	55 - 130	6.223	6.089167	0.1338	+/-1.0	
Veno-SD11-000H (A302857-01RE1)			Lab File ID: 2FB022.D		Analyzed: 06/07/13 14:48			
2,4,5,6-TCMX	0.0786	4	70 - 125	2.131	2.003333	0.1277	+/-1.0	*
2,4,5,6-TCMX [2C]	0.0786	3	70 - 125	2.009	1.894667	0.1143	+/-1.0	*
Decachlorobiphenyl	0.0786	8	55 - 130	6.166	6.021	0.1450	+/-1.0	*
Decachlorobiphenyl [2C]	0.0786	6	55 - 130	6.223	6.089167	0.1338	+/-1.0	*

NO

* This run of the sample was excluded in favor of sample analyzed within HT & surrogate %R's > 10%.

YES NO N/A

Table 2. Surrogate Recovery Criteria

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement
150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample(LCS)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples. ✓ [ ] ___ ___

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

YES NO N/A

4.2 Were Laboratory Control Samples analyzed at the required concentration for all analytes of interest as specified in ~~Table 3 below.~~ lab SOPs & DOD QSM [✓] ___ ___

Note: Use lab in-house criteria, if available.

Table 3. LCS Spiking Criteria

LCS Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml	Recovery Limits (%)
gamma-BHC	0.05	1	50-120
Heptachor epoxide	0.05	1	50-120
Dieldrin	0.01	1	30-130
4,4'-DDE	0.01	1	50-150
Endrin	0.01	1	50-120
Endosulfan sulfate	0.01	1	50-120
gamma-Chloradane	0.05	1	30-130
Tetrachloro-m-xylene(surrogate)	0.20	3	30-150
Decachlorobiphenyl (surrogate)	0.40	3	30-150

JC 7/11/3

Note: The LCS might be spiked with the same analytes at the same concentration as the matrix spike.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed in table above? [✓] ___ ___

YES NO N/A

ACTION: For LCS % recovery not meeting the required recovery, follow the required action in Table 4 below.

Table 4. LCS Recovery Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Upper Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent)

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? [✓] ___ ___ XI corr JAC 7113

MS/MSD pair from SDG 304 302428

NOTE: For soil and waste samples showing detectable amounts of organics, the lab may substitute replicate samples in place of the matrix spike (see page 8000B-40, section 8.5.3).

5.2 Have MS/MD or MS/MSD results been summarized on Form III/Equivalent? Vepo-SD02-000H [✓] ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000B-39, section 8.5.])

	YES	NO	N/A
a. Water	[ ]	___	✓
b. Waste	[ ]	___	✓
c. Soil/Solid from related SDG	[✓]	___	___

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 ~~We~~ Were Matrix Spike Samples analyzed at the required concentration for all analytes of interest as specified ~~in Table 5 below.~~ lab SOPs / SAP [✓] ___ ___

Note: Spiking analytes may differ from those in Table 5. Check QA project plan or task order.

Table 5. Matrix Spiking Criteria

Matrix Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml
gamma-BHC	0.05	1
Heptachor	0.05	1
Aldrin	0.05	1
Dieldrin	1.0	1
Endrin	1.0	1
4,4'-DDT	1.0	1

Note: For aqueous organic extractable, the spike concentration should be:

1) For regulatory compliance monitoring - the regulatory concentration limit or 1 to 5 times the expected background concentration, whichever is higher;

2) For all other aqueous samples - the larger of either 1 to 5 x times the expected background

YES NO N/A

concentration, or the same as the QC check sample concentration (see section 4 above);

3) For soil/solid and waste samples - the recommended concentration is 20 times the estimated quantitation limit (EQL).

No action is taken based on MS or replicate data alone. However, using informed professional judgement, the data reviewer may use the matrix spike or laboratory replicate results in conjunction with other QC criteria and determine the need for some qualification of the data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples.

5.5 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed ~~in Table 6 below.~~ on MS/MSD forms [ ] ✓ ___

Note: Use lab in-house criteria, if available. LCS samples were OK - NO Samples were flagged for surrogates

Table 6. Matrix Spike Recovery Criteria

Compound	% Recovery Water	RPD Water	% Recovery Soil	RPD Soil
gamma-BHC	56-123	0-15	46-127	0-50
Heptachor	40-13	0-20	35-130	0-31
Aldrin	40-120	0-22	34-132	0-43
Dieldrin	52-126	0-18	31-134	0-38
Endrin	56-121	0-21	42-139	0-45
4,4'-DDT	38-127	0-27	23-134	0-50

NOTE: The actual number of MS analytes depends on the number analytes being measured (e.g., total number of MS plus MSD compounds). If only chlordane or toxaphene are the analytes of

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8081B

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E21001	Laboratory ID:	3E21001-MS1
Preparation:	EPA 3550C	Initial/Final:	30.1 g / 10 mL

Source Sample Name: Veno-SD02-000H

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	MS CONCENTRATION (mg/kg dry)	MS % REC. #	QC LIMITS REC.	
4,4'-DDE	0.0708	0.017	0.066	69 *	70 - 125	NQ
4,4'-DDD	0.0708	0.0071	0.057	71	30 - 135	
4,4'-DDT	0.0708	0.0037	0.038	48	45 - 140	

COMPOUND	SPIKE ADDED (mg/kg dry)	MSD CONCENTRATION (mg/kg dry)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.	
4,4'-DDE	0.0710	0.066	68 *	0.009	30	70 - 125	NQ
4,4'-DDD	0.0710	0.065	82	13	30	30 - 135	
4,4'-DDT	0.0710	0.032	39 *	17	30	45 - 140	NQ

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

LCS recoveries were all OK
No Quals in assoc. samples.

YES NO N/A

interest, the spiked sample should contain the most representative multi-component analyte.

ACTION: Follow the matrix spike actions (Table 7) for pesticide analyses.

Table 7. Matrix Spike Qualifying Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% R ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R; RPD ≤ Upper Acceptance Limit	No qualifications	

Note: When the results of the matrix spike analyses indicates a potential problem due to the sample matrix itself, the LCS results are used to verify the laboratory can perform analyses in a clean matrix.

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on Method Blank Summary form(s) (Form IV)?

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? [✓] ___ ___

Note: Method blank should be analyzed, either after the calibration standard or at any other time during the analytical shift.

YES NO N/A

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for pesticides? [✓] ___ ___

ACTION: Use professional judgement to determine the effect on the data.

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for organochlorine pesticides? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ___ [✓] ___

7.2 Do any field/rinse blanks have positive organochlorine pesticide results? ___ [✓] ___

Vero-EB01-051613-SD

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in

YES NO N/A

another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 8 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 8. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying the calibration criteria.

Note: When applied as described in Table 8 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams", "junk peaks"), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference.

YES NO N/A

Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? [✓] ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic column used for the analysis of organochlorine pesticides? Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (See Method 8081B-8, section 4.2) [✓] ___ ___

8.2 If capillary columns were used, were they both wide bore (.53 mm ID) fused silica GC columns, such as DB-608 and DB-1701 or equivalent. Indicate the specific type of column used for:

column 1: Stx-CLP Pesticides, 0.32mm

column 2: Stx-CLP Pesticides2, 0.32mm

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. DDT/endrin breakdown check [✓] ___ ___

	YES	NO	N/A
b. toxaphene	[ ]		✓
c. technical chlordane x1com JC 7/13	[✗]		✓
d. 5 pt. initial calibration standards	[✓]		
e. calibration verification standards	[✓]		
f. LCS	[✓]		
g. Method blanks	[✓]		

ACTION: If no, take action specified in 3.2 above.

9.2 Has a DDT/endrin breakdown check standard (at the mid-concentration level) been analyzed at the beginning of each analytical sequence on both columns (page 8081B-24, section 8.2.3)? [✓] ___ ___

ACTION: If no, take action as specified in 3.2 above.

9.3 Has the individual % breakdown exceeded 20.0% on either column for:

- 4,4' - DDT? ___ [✓] ___
- endrin? ___ [✓] ___

ACTION: If any % breakdown has failed the QC criteria in the breakdown check standard, qualify all sample analyses in the entire analytical sequence as described below.

a. If 4,4'-DDT breakdown is greater than 20.%:

i. Qualify all positive results for DDT with 'J". If DDT was not detected, but DDD and DDE are positive, then qualify the quantitation limit for DDT as unusable ("R").

ii. Qualify positive results for DDD and DDE as presumptively present at an approximated quantity ("NJ").

YES NO N/A

b. If endrin breakdown is greater than 20.0%:

i. Qualify all positive results for endrin with "J". If endrin was not detected, but endrin aldehyde and endrin ketone are positive, then qualify the quantitation limit for endrin as unusable ("R").

ii. Qualify positive results for endrin ketone and endrin aldehyde as presumptively present at an approximated quantity ("NJ").

9.4 Are data summary forms (containing calibration factors or response factors) for the initial 5 pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? [✓] ___ ___

NOTE: If internal standard calibration procedure is used (page 8000B-16, section 7.4.2.2), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (page 8000B-16, section 7.4.2.1), then calibration factors must be used.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.5 Are there any transcription/calculation errors between raw data and data summary forms. ___ [✓] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.6 Are standard retention time (RT) windows for each analyte of interest presented on modified CLP summary forms? [ ] [✓] ___

Retention times were listed on quant pages & S-RTs flagged as needed. RTs were steady.

YES NO N/A

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all pesticides are established using retention times from three calibration standards analyzed during the entire analytical sequence (page 8081B-15, section 7.4.6).

A 72 hr. sequence is not required with this method, however, the method states that best results are obtained using retention times which span the entire sequence; i.e., using the mid level from the 5 pt. calibration, one of the mid-concentration standards analyzed during mid-sequence and one analyzed at the end.

9.7 Were RT windows on the confirmation column established using three standards as described above? [ ] __ __

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.6 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples.

ACTION: Note potential problems, if any, in the data assessment.

9.8 Do all standard retention times in each level of the initial 5 pt. calibrations for pesticides fall within the windows established during the initial calibration sequence? RTs stable but RTWs weren't provided [✓] __ __

ACTION: i. If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standards, spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows

YES NO N/A

may be too tight. If so, RT windows should be recalculated as per page 8081B-15, section 7.4.6.2

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

ACTION: For toxaphene and chlordane, the RT may be outside the RT window, but these analytes may still be identified from their individual patterns.

9.9 Has the linearity criteria for the initial calibration standards been satisfied for both columns? (% RSD must be < allowable limits* for all analytes). [✓] ___ ___.
Lab used linear regression curve for quantitation

ACTION: If no, follow the actions in Table 9 below.

Table 9. Initial Calibration Linearity Criteria

Criteria	Criteria	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD exceeds allowable limits*	J	No qualification
% RSD within allowable limits*	NO qualifications	

* %RSD ≤ 20% for single component compounds except alpha-BHC and delta-BHC.
%RSD ≤ 25% for alpha-BHC and delta-BHC
%RSD ≤ 30% for Toxaphene peaks
%RSD ≤ 30% for surrogates(tetrachloro-m-xylene and decachlorobiphenyl).

9.10 Has a calibration verification standard containing all analytes of interest been analyzed on each

CONTINUING CALIBRATION CHECK

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCECD2	Calibration:	1304047
Lab File ID:	2F4003.D	Calibration Date:	04/16/13 08:54
Sequence:	AA24376	Injection Date:	06/04/13
Lab Sample ID:	AA24376-CCV1	Injection Time:	10:28

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
4,4'-DDE	A	0.100	0.10	1.65308	1.859108		12.5	20
4,4'-DDD	A	0.100	0.097	1.000398	1.031309		3.1	20
4,4'-DDT	A	0.100	0.080	0.8654057	0.6892789		-20.4	20 *

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

all associated - Flag J/UJ all DDT results in all samples

CONTINUING CALIBRATION CHECK

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCECD2	Calibration:	1304047
Lab File ID:	2FB003.D	Calibration Date:	04/16/13 08:54
Sequence:	AA24452	Injection Date:	06/07/13
Lab Sample ID:	AA24452-CCV1	Injection Time:	10:28

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
4,4'-DDE	A	0.100	0.11	1.65308	2.030394		22.8	20 *	NG
4,4'-DDD	A	0.100	0.091	1.000398	0.9663401		-3.4	20	
4,4'-DDT	A	0.100	0.096	0.8654057	0.8329565		-3.7	20	

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

* associated sample was not reported

YES NO N/A

working day, prior to sample analyses (pages 8081B-15, sections 7.5.2)? [✓] ___ ___

9.11 Has a calibration verification standard also been analyzed after every 10 samples and at the end of each analytical sequence (page 8081B-15, section 7.5.2)? [ ] ✓ ✓

ACTION: If no, take action as specified in section 3.2 above. 15 method - 12 hr. opener required.

9.12 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence (closing CCV). Has no more than 72 hours elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene CCV? [✓] ___ ___

ACTION: See Table 10 below.

9.13 Has the percent difference (%D) exceeded ± 20% for any organochlorine pesticide analyte in any calibration verification standard? ✓ [ ] ___

9.14 Has a new 5 pt. calibration curve been generated for those analytes which failed in the calibration verification standard (page 8081B-16, section 7.5.2.2), and all samples which followed the out-of-control standard (page 8081B-16, section 7.5.2.3) reinjected? [ ] ✓ ___ See forms for flags

ACTION: If the %D for any analyte exceeded the ± 20% criterion and the instrument was not recalibrated for those analytes, see table below.

9.15 Have <u>daily</u> retention time windows been properly calculated for each analyte of interest (page 8081B-16, section 7.5.3)), using RTs from the associated mid concentration standard and standard deviation from the initial calibration)? [✓] ___ ___ RTs Stable & Calc per lab SOP

YES NO N/A

ACTION: If no, take action specified in section 3.2 above or recalculate RT windows using the procedure outlined in method 8081B-16, section 7.5.3.

9.16 Do all standard retention times for each mid concentration standard fall within the windows established during the initial calibration sequence? [ ] ___ ✓

9.17 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows (page 8081B-16, section 7.5.3)? RT's stable [✓] ___ ___

ACTION: If the answer to either 9.15 or 9.16 above is no, check the chromatograms of all samples which followed the last in-control standard. All samples analyzed after the last in-control standard must be re-injected, if initial analysis indicated the presence of the specific analyte that exceeded the retention time criteria (page 8081B-18, section 7.5.7.). If samples were not re-analyzed, document under Contract Non-compliance in the Data Assessment.

Reviewer has two options to determine how to qualify questionable sample data. First option is to determine if possible peaks are present within daily retention time window. If no possible peaks are found, non-detects are valid. If possible peaks are found (or interference), qualify positive hits as presumptively present "NJ" and non-detects are rejected "R". Second option is to use the ratio of the retention time of the analyte over the retention time of either surrogate. The passing criteria is ± 0.06 RRT units of the RRT of the standard component. Reject "R" all questionable analytes exceeding criteria, and "NJ" all other positive hits.

For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use option 2 specified in paragraph above.

Initial Calibration Date: 4/15-16/13, Instrument OSVGCECD2

RRF and %RSD Calculations:

Compound Name: 4,4'-DDT in level 2
Lab Value: 0.7290

Area of Compound	28988422
Conc. of Compound	0.01
Area of Internal Standard	397700000
Conc. Of Internal Standard	0.1
Calculated CF	0.729

Compound Name: 4,4'-DDT
Lab Value: 9.32

CF of STD 1	0.905
CF of STD 2	0.729
CF of STD 3	0.806
CF of STD 4	0.899
CF of STD 5	0.933
CF of STD 6	0.921
CF of STD 7	
CF of STD 8	
Calculated % RSD	9.31

Continuing Calibration File ID: 2F4003.D, 4/16/13, 0854

RRF and %D Calculations:

Compound Name: 4,4'-DDD
Lab Value: 1.0313

Area of Compound	434800000
Conc. of Compound	0.1
Area of Internal Standard	421600000
Conc. Of Internal Standard	0.1
Calculated CF	1.031

Compound Name: 4,4'-DDD
Lab Value: -3.3

Average CF	1.000
CF of CCV	1.031
Calculated % D	-3.1

YES NO N/A

See Table 10 below.

Table 10. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
RT out of RT window	Use professional judgement	
%D not within +/- 20%	J	UJ
Time elapsed greater than section 9.12 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.18 Are there any transcription/calculation errors between raw data and data summary forms? ___ [✓] ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? [✓] ___ ___

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? [✓] ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it

YES NO N/A

accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

11.0 Extraction Method Cleanup Efficiency Verification (Form IX/Equivalent)

11.1 Method 8081B permits a variety of extraction techniques to be used for sample preparation. Which extraction procedure was used?

1. Aqueous samples:

1. Separatory funnel (Method 3510) ✓ EB

2. Continuous liquid-liquid extraction (Method 3520) _____

3. Solid phase extraction (Method 3535) _____

4. Other _____

2. Solid samples:

1. Soxhlet (Method 3540) _____

2. Automated Soxhlet (Method 3541) _____

3. Pressurized fluid (Method 3545) _____

4. Microwave extraction (Method 3546) _____

5. Ultrasonic extraction (Method 3550) ✓ SD

6. Supercritical fluid (Method 3562) _____

7. Other _____

11.2 Is Form IX - Pest-1/Equivalent present and complete for each lot of Florisil/Cartridges used? (Florisil Cleanup, Method 3620A, is required for all organochlorine pesticide extracts.) [ ] ___ ✓

YES NO N/A

ACTION: If no, take action specified in 3.2 above. If data suggests that florisil cleanup was not performed, make note in the reviewer narrative.

NOTE: Method 3620A uses Florisil, while the SOW/CLP allows for Florisil cartridges. Method 3620A does not list which pesticides and surrogate(s) to use to verify column efficiency. The reviewer must check project plan to verify method used as well as the correct pesticide list. If not stated or available, use the CLP listing or accept what the laboratory used.

11.3 Are all samples listed on modified CLP Pesticide Florisil/Cartridge Check Form? [ ] ___ ✓

ACTION: If no, take action specified in 3.2 above.

11.4 If GPC Cleanup was performed, is Form IX - Pest-2/ Equivalent present? [ ] ___ ✓

ACTION: If GPC was not performed and sample results indicate significant sulfur interference, make note in the data assessment.

NOTE: GPC cleanup is not required and is optional. The reviewer should check Project Plan to verify requirement.

11.5 Were the same compounds on Form IX used to check the efficiency of the cleanup procedures? [ ] ___ ✓

11.6 Are percent recoveries (% R) of the pesticide and surrogate compounds used to check the efficiency of the cleanup procedures within QC limits listed on Form IX:

80-120% for florisil cartridge check? [ ] ___ ✓

80-110% for GPC calibration? [ ] ___ ✓

YES NO N/A

Qualify only the analyte(s) which fail the recovery criteria as follows:

ACTION: If % R are < 80%, qualify positive results "J" and quantitation limits "UJ". Non-detects should be qualified "R" if zero %R was obtained for pesticide compounds. Qualify positive results "J" (estimated).

NOTE: If 2,4,5-trichlorophenol was used to measure the efficiency of the Florisil cleanup and the recovery was > 5%, sample data should be evaluated for potential interferences.

12.0 Pesticide Identification

12.1 Has CLP Form X, showing retention time data for positive results on the two GC columns, been completed for every sample in which a pesticide was detected? ☑ ___ ___

ACTION: If no, take action specified in 3.2 above, or compile a list comparing the retention times for all sample hits on the two columns.

12.2 Are there any transcription/calculation errors between raw data and data summary forms (initial calibration summaries, calibration verification summaries, analytical sequence summaries, GPC and Florisil cleanup verification forms)? ___ ☑ ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and note error in the data assessment.

12.3 Are retention times (RT) of sample compounds within the established RT windows for both analyses? ☑ ___ ___

Note: Confirmation can be supported by other qualitative techniques such as GC/MS (Method 8270), or GC/AED (Method 8085) if sensitivity permits.

Veno-SD11-0H01

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-02	File ID:	2F4036.D
Sampled:	05/16/13 09:00	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 17:11
Solids:	95.14	Preparation:	EPA 3550C	Instrument:	OSVGCECD2

Batch: 3E21001 Sequence: AA24376

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
4,4'-DDE	* 1	4.16	3.951167	0.209		0.0015	30.8
4,4'-DDE	2	4.151	3.944	0.207		0.0011	30.8
2,4,5,6-TCMX	* 1	2.153	2.003333	0.15		0.012	8.7
2,4,5,6-TCMX	2	2.035	1.894667	0.14		0.011	8.7
Decachlorobiphenyl	* 1	6.19	6.021	0.169		0.022	20
Decachlorobiphenyl	2	6.253	6.089167	0.164		0.018	20
DBC	* 1	5.482	5.309333	0.173		0.10	0
DBC	2	5.388	5.218833	0.169		0.10	0

JA NQ · 40

* Column used for quantitation

x1com JAC 71113

Veno-SD11-000H

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302857-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302857-01RE1	File ID:	2FB022.D
Sampled:	05/16/13 08:50	Prepared:	06/06/13 12:45	Analyzed:	06/07/13 14:48
Solids:	42.39	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3F06020	Sequence:	AA24452		

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
2,4,5,6-TCMX	* 1	2.131	2.003333	0.128		0.0033	16.4
2,4,5,6-TCMX	2	2.009	1.894667	0.114		0.0028	16.4
Decachlorobiphenyl	* 1	6.166	6.021	0.145		0.0061	25.9 NC
Decachlorobiphenyl	2	6.223	6.089167	0.134		0.0047	25.9 <40
DBC	* 1	5.459	5.309333	0.15		0.10	0
DBC	2	5.359	5.218833	0.14		0.10	0

* Column used for quantitation

YES NO N/A

ACTION: Qualify as unusable (R) all positive results which were not confirmed by second GC column analysis. Also qualify "R", unusable, all positive results not within RT windows unless associated standard compounds are similarly biased. The reviewer should use professional judgement to assign an appropriate quantitation limit.

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently (see section 9.7 above). Also check for false negatives among the multiple peak compounds toxaphene and chlordane. Were there any false negatives? ___ [✓] ___

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation used as the second column Confirmation? (This is not required). [ ] ___ [✓]

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns <25.0%? [✓] ___ ___

NOTE: The method 8081B requires quantitation from one column. The second column is to confirm the presence of an analyte. Calibration for the Confirmation column is a one point calibration. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

YES NO N/A

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

% Difference	Qualifier
0-25%	none
26-70%	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected) "NJ"	
>50% (Pesticide vale is <CRQL)	"U"
>201%	"R"

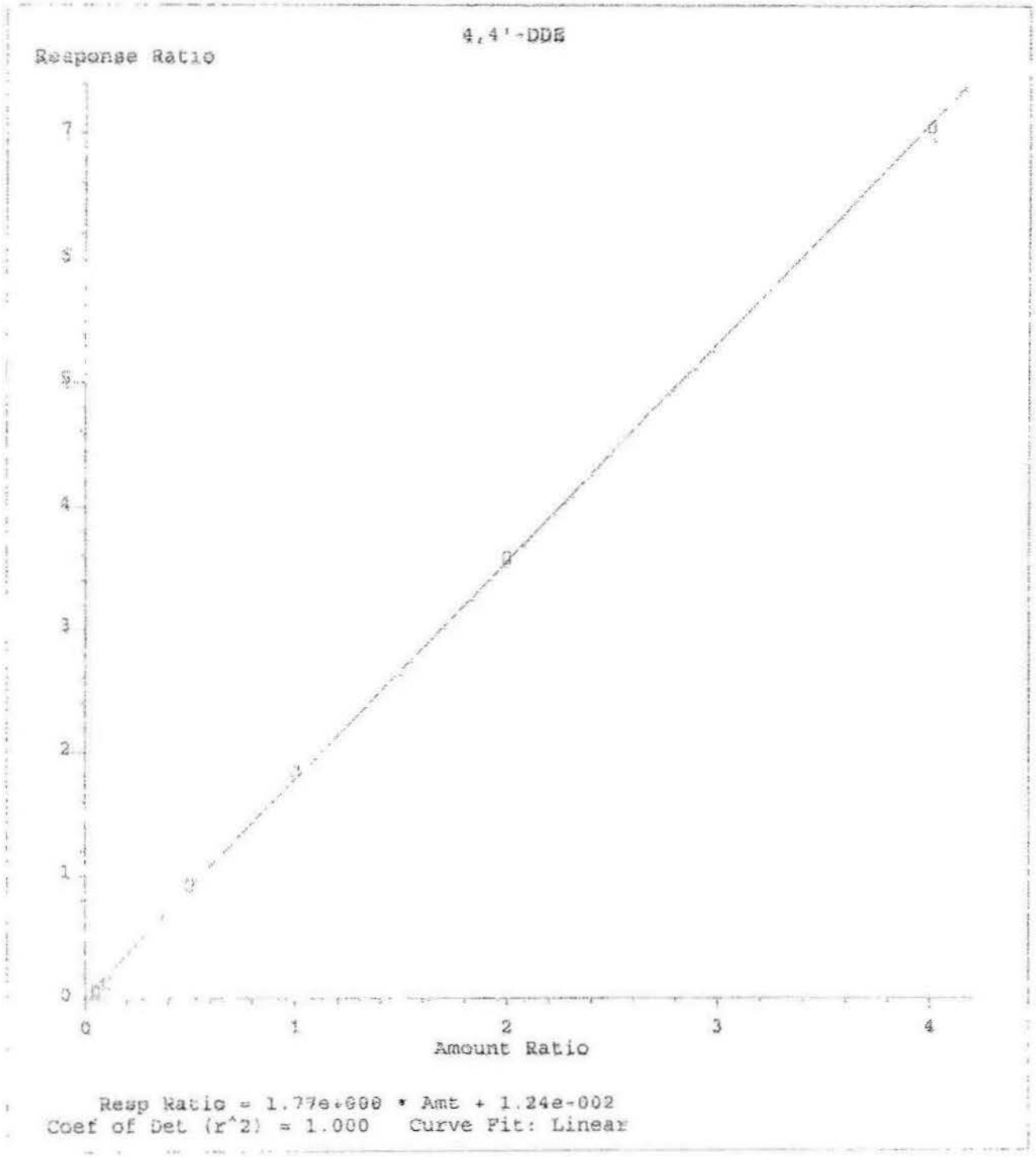
Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that the higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ [✓] ___

NOTE: Single-peak pesticide results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

Sample A30285702 (Veno-SD11-0H01)
4,4'-DDE 0.0015 mg/kg Area Counts DDE



Method Name: Z:\2\METHODS\PEST2DJ13.M
Calibration Table Last Updated: Wed Jul 10 09:45:27 2013

$$\underset{(ug/ml)}{Amt} = \left(\frac{DDE\,A}{Int\,A} - b\right)\left(\frac{Int\,Amt}{m}\right) = 0.0021\ ug/mL\left(\frac{10\ mL}{30.1\ g}\right)\left(\frac{1}{0.9514}\right)(2,$$

$$= 0.00147\ mg/kg$$

YES NO N/A

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? [ ] ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? [✓] ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ [✓] ___

ACTION: Note all system performance problems in the data assessment.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for organochlorine pesticide analysis? [ ] ___ ✓

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made to determine the proper identification of field duplicates.

Jacqueline Cleveland

From:	Marcia Colon <mcolon@encolabs.com>
Sent:	Thursday, July 11, 2013 12:43 PM
To:	'Jacqueline Cleveland'
Cc:	'DataQual'; Juliana.Dean@ch2m.com
Subject:	RE: Laguna La Chiva Pesticides
Attachments:	A302428 REV 8081B.pdf; A302857 REV 8081B.pdf; A302870 REV 8081B.pdf; CTO-037 _Attachment 3 Self-Declaration_La Chiva Lab_FINAL_Signed.pdf; EPA 8081B Calculation.pdf

Hi Jackie-
I have all the information for you. I added in your other 2 email requests to your individual email so I could respond to all the questions/comments.

See my response below. If you need anything else just let me know ☺.

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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ENCO is an eco-friendly lab offering paperless service options, please contact me anytime with questions.

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, July 09, 2013 5:49 PM
To: 'Marcia Colon'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: Laguna La Chiva Pesticides

Hello Marcia,

I have a couple of issues with the pesticides data packages submitted for the CH2M HILL Laguna LaChiva project. SDG numbers affected by this request are A302857, A302870 & A302428.

Questions:

*The continuing calibration check standards do not reflect accurate %Ds based on the response factor values presented. For example: see page 955 in SDG A302857. The RRF for DDE in the ICAL is listed as 165.308 and the RRF for DDE in the CCV is listed as 1.859108. These values are not comparable. There are two form 6 equivalents in the data package and they reflect RRFs that appear to have been calculated two different ways. The CCV forms must reflect RRFs that were consistently calculated. Please look in to this issue and resubmit the CCV forms (form 7 equivalents) to reflect consistent RRFs and correct %Ds.

The wrong internal ID number was included in the curve data. The analyst had corrected this error but didn't let me know, I had already run the data package and so the wrong information was included on the CCV forms. I have rerun the FORM1s for EPA 8081B and the correct RF is included.

*I am not finding closing CCVs for the analytical sequences. Please submit closing CCVs for all sequences to include summary forms and raw data.

I have attached a copy of the attachment 3 where we include our exception that we report using internal standardization.

*Generally column quantitation %RPDs are reported on a form that includes the quantitated value from both columns. The submitted forms does not include both of the quantitated values. Please comment on this to include an explanation of which value you are reporting (highest or lowest quantitated values).

I have rerun the FORM1s, the dual column forms not show both the primary and second column values. I have discussed this with the analyst and from now on we will make sure we report both columns.

Thank you for your help!

Jackie

I have one additional question regarding the pesticides SDGs. When attempting to reproduce the quantitation calculations from raw area I am unable to calculate the values reported on the quantitation pages. However, I am able to produce the reported results from the ug/ml value present on the quantitation pages. Please provide a calculation example that walks me through your quantitation process from raw area counts for one reported positive result for a target compound. Thank you!

The analyst wrote out the calculation and a copy of this has been included.

Thanks for letting me know you are working on the requests. I have an additional question about the pesticides. It looks like the submitted surrogate recovery forms do not include recoveries for both surrogates/columns. For example, there is only one TCMX recovery and one DCB recovery for sample VENO-SD11-000H. Generally, recoveries are reported from both columns for all samples. Please update these forms to include all recoveries for the surrogate compounds. Thank you!

The FORM1s have been rerun. The surrogates & internals have been reported from both columns. Again, I will make sure we start reporting both columns.

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC

636-352-9391
cleve137@charter.net

Jacqueline Cleveland

From: Marcia Colon <mcolon@encolabs.com>
Sent: Monday, July 15, 2013 12:23 PM
To: 'Jacqueline Cleveland'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides
Attachments: EPA 8081B(AA23829) CURVE PLOTS.PDF

Sorry Jackie-
I meant to send the plots along with me email.

Here you go ☺

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Monday, July 15, 2013 12:26 PM
To: Marcia Colon
Cc: DataQual; <Juliana.Dean@ch2m.com>
Subject: Re: Laguna La Chiva Pesticides

Hi Marcia,

I understand and have information for both curve processing methods. However the calculation example provided by the analyst quanted against the LR curve. That is fine but if all of the quantitation is performed against the LR curves then I need the curve plots for all of the target compounds & surrogates. Will you send those to me please. The only one she sent was for the example, I think it was DDE. Thanks.

Jackie

Sent from my iPhone

On Jul 15, 2013, at 10:41 AM, "Marcia Colon" <mcolon@encolabs.com> wrote:

<image002.jpg>
Hi Jackie-
ENCO analyzes both EPA 8081B and EPA 608 samples, in speaking with the Organics Manager he said that the analyst that processed the curve was using EPA 608 criteria and chose to use linear regressions to meet the 608 criteria, when he did this he did not print out the plots to be included with the curve data. Because we analyze EPA 608 and EPA 8081B samples we process the curve twice, once processed against EPA 608 criteria and then against EPA 8081B criteria. In this case the analyst did not do that, he just processed the curve against the EPA 608 criteria. The curve did meet all the EPA 8081B criteria to report all analytes against response factor.

If you need anything else please let me know.

Thanks!!

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Thursday, July 11, 2013 8:30 PM
To: 'Marcia Colon'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides

Marcia,

Thank you for providing answers/resubmission in response to my request. Based on your response regarding the calculation example it looks like all of your quantitation was performed against the plotted linear regression curves. If that is the case I need you to send me the rest of the curve plots. The analyst sent the plot for DDE as part of her example calculation but she didn't send the other target compounds or the surrogate compounds. It also looks like the continuing calibrations were assessed by comparing the response factors and not for the calculated amounts (%D vs %Drift). Generally if

quantitation is performed via the LR curves the expectation is that %Drifts would be reported. The values are similar and the difference between them will not likely affect the data. I just need a statement as to the labs general practice. Thank you for your help!

Jackie

From: Marcia Colon [mailto:mcolon@encolabs.com]
Sent: Thursday, July 11, 2013 12:43 PM
To: 'Jacqueline Cleveland'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides

Hi Jackie-
I have all the information for you. I added in your other 2 email requests to your individual email so I could respond to all the questions/comments.

See my response below. If you need anything else just let me know ☺.

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, July 09, 2013 5:49 PM
To: 'Marcia Colon'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: Laguna La Chiva Pesticides

Hello Marcia,

I have a couple of issues with the pesticides data packages submitted for the CH2M HILL Laguna LaChiva project. SDG numbers affected by this request are A302857, A302870 & A302428.

Questions:

Jacqueline Cleveland

From: Marcia Colon [mcolon@encolabs.com]
Sent: Tuesday, July 16, 2013 11:48 AM
To: 'Jacqueline Cleveland'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides
Attachments: EPA 8081B LR CURVE PLOTS.pdf

Hi Jackie-
Enclosed are the 3 additional curve plots.

Thanks!!

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Monday, July 15, 2013 8:05 PM
To: 'Marcia Colon'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides
Importance: High

Marcia,

I was working on my calculations tonight and noticed that the pdf file you sent me doesn't contain the curve plots for DDT or either surrogate compound. Will you send those over please? I was hoping to send the DVR to CH2M tomorrow! Thank you!

Jackie

From: Marcia Colon [mailto:mcolon@encolabs.com]
Sent: Monday, July 15, 2013 12:23 PM
To: 'Jacqueline Cleveland'

DataQual

Environmental Services, LLC

CH2M HILL
15010 Conference Center Drive
Suite 200
Chantilly, VA 20151

July 16, 2013
SDG# A302870, ENCO
Vieques East, Puerto Rico- Laguna La Chiva SWMU 1

Dear Mr. Zamboni,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # A302870. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8260B-Rev 2, August 2008-SOP#HW-24, 8270D-Rev 3, October 2006-SOP #HW-22, 8081B-Rev. 1.0, October 2006-SOP HW-44) and professional judgment. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	VOA	SVOA	Pest
VENO-SS03-0001	A302870-01	soil			X
VENO-SS02-0001	A302870-02	soil			X
VENO-SS02-0001MS	A302870-02MS	soil			X
VENO-SS02-0001MSD	A302870-02MSD	soil			X
VENO-SS06-0001	A302870-03	soil			X
VENO-EB02-051613-SS	A302870-04	soil			X
VENO-SD04-000H	A302870-05	soil	X	X	X
VENO-SD04-0H01	A302870-06	soil	X	X	X
VENO-SD05-000H	A302870-07	soil	X	X	X
VENO-SD06-000H	A302870-08	soil	X	X	X
VENO-SD07-000H	A302870-09	soil	X	X	X
VENO-SD07P-000H	A302870-10	soil	X	X	X
VENO-EB01-051713-SD	A302870-11	water	X	X	X
VENO-TB01-051713-SD	A302870-12	water	X		

The following quality control samples were provided with this SDG: samples VENO-EB01-051713-SD & VENO-EB02-051613-SS-equipment blanks, sample VENO-TB01-051713-SD-trip blank and sample VENO-SD07P-000H-field duplicate of sample VENO-SD07-000H.

5830 Amberway Drive • St. Louis, MO 63128 • 314-330-1327 • Fax 314-849-6264

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition
- Technical Holding Times
- GC/MS Tuning *
- GC Performance *
- ICP MS Tuning *
- Initial/Continuing Calibrations
- ICSA/ICSAB Standards *
- LLQ Standards *
- Blanks *
- Internal Standards *
- Surrogate Recoveries
- Laboratory Control Samples *
- Matrix Spike Recoveries
- Matrix Duplicate RPDs *
- Serial Dilutions *
- Field Duplicates *
- Identification/Quantitation
- Reporting Limits *

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

Overall Evaluation of Data/Potential Usability Issues

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

All Fractions

The results for four soil samples were qualified as estimated due to high percent moisture content.

VOA

The initial calibration exhibited a low RRF values which resulted in qualifying the associated sample positive results as estimated and non-detect results as rejected.

Due to non-compliant surrogate recoveries qualifications were added to one sample.

SVOA

One sample re-extraction was completed outside the required holding time; therefore results were qualified as estimated.

The initial and continuing calibrations exhibited a high %RSD and %D values which resulted in qualifying the associated sample results as estimated.

Due to non-compliant surrogate recoveries qualifications were added to three samples.

Pesticides

Two samples were re-extracted six days outside the fourteen day extraction holding time. The samples were re-extracted due to non-compliant surrogate recoveries and the matrix effect was confirmed. Therefore, the RX samples were excluded in favor of the results from the original extraction analysis with a qualifier code of RE.

Qualifications were required due to non-compliant surrogate recoveries.

One compound exhibited a high %D (>20%) due to a decrease in instrument sensitivity. Therefore the compound was qualified as estimated in the samples.

One compound in the MS/MSD of the SS sample matrix exhibited a low recovery for DDE in both spike aliquots. Therefore, the compound was qualified as estimated J/UJ in the native sample only. The RX of the MS/MSD pair was not reported because it was extracted outside the holding time and the surrogate recovery matrix effects were confirmed.

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

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the pesticides fraction. Clarification and additional information was required regarding the calibrations in the pesticide fraction. Some of the reporting forms required modification and resubmission because they were incomplete.

Also, an example quantitation calculation was requested. All requested items were received from the laboratory. A copy of the email correspondence is included in the validation worksheets section of this report.

Sample Condition

All Fractions

The following soil samples contained 50-90% water. For all fractions, all reported results in the samples required qualification as estimated (J/UJ).

Sample ID	% Moisture
VENO-SD04-000H	76.15
VENO-SD04-0H01	68.45
VENO-SD05-000H	72.18
VENO-SD06-000H	63.09

Technical Holding Times

According to chain of custody records, sampling was performed on 5/16-17/13 and samples were received on 5/18/13. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the exception of the following.

SVOA

The re-extraction of sample VENO-SD04-000H was completed 7 days outside the 14 day holding time. Therefore results for this sample were qualified as estimated (J/UJ), qualifier code: HT.

Pesticides

The re-extraction of samples VENO-SS02-0001 and VENO-SD07-000H was completed 6 days outside the 14 day holding time. The reanalysis of the sample exhibited recoveries that were below the lower QC limits for one or both surrogate compounds. Therefore results for these samples were excluded with the qualifier code: RE.

Initial/Continuing Calibration

VOA

Calibration standards exhibited RRF values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results were qualified as indicated.

Calibration File	Compound(s)	RRF, %RSD, %D	Samples	Q Flag	Q Code
IC 04/09/13	2-butanone	0.0439	VENO-TB01-051713-SD, VENO-EB01-051713-SD	J/R	ICL
	4-methyl-2-pentanone	0.0309			

SVOA

Calibration standards exhibited %RSD and %D values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results were qualified as indicated.

Calibration File	Compound(s)	RRF, %RSD, %D	Samples	Q Flag	Q Code
IC 04/24/13	2,4-dinitrophenol	37.65	all samples	J/UJ	ICH
	2-methyl-4,6-dinitrophenol	30.22			
CC 06/03/13	4-nitrophenol	42.2	VENO-SD04-0H01, VENO-SD05-000H, VENO-SD06-000H, VENO-SD07-000H, VENO-SD07P-000H	J/UJ	CCH
	2,4-dinitrotoluene	21.4			
	4-nitroaniline	27.9			
	butylbenzylphthalate	21.4			
CC 06/05/13	4-nitroaniline	24.0	VENO-EB01-051713-SD	J/UJ	CCH
CC 06/10/13	4-nitrophenol	43.1	VENO-SD04-000HRE	J/UJ	CCH
	4-nitroaniline	23.2			

Pesticides

Calibration standards exhibited a %D value that was non-compliant. A summary of this non-compliance and affected samples is noted in the following table. Sample results were qualified as indicated.

Calibration ID	Compound	%D	Samples	Q Flag	Q Code
2F4003.D, 6/4/13 @ 1028	4,4'-DDT	-20.4	all samples	J/UJ	CCL

Surrogates

VOA

The following samples exhibited non-compliant recoveries for the surrogate listed in the table below; qualifications were applied as noted. The sample was not re-analyzed by the laboratory.

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VENO-SD04-000H	4-bromofluorobenzene	82	85-120	J/UJ	SSL

SVOA

The following samples exhibited non-compliant recoveries for the surrogate listed in the table below; qualifications were applied as noted.

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VENO-SD04-000HRE*	2-fluorophenol	31	35-105	J/UJ acid fraction compounds	SSL
	phenol-d5	37	40-100		
	nitrobenzene-d5	23	35-100		
	2-fluorobiphenyl	4	45-105	J/R B/N fraction compounds	
	2,4,6-tribromophenol	16	35-125		
	terphenyl-d14	7	30-125		
VENO-SD04-0H01^	2-fluorophenol	20	35-105	J/R	SSL
	phenol-d5	24	40-100		
	nitrobenzene-d5	13	35-100		
	2-fluorobiphenyl	0	45-105		
	2,4,6-tribromophenol	7	35-125		
	terphenyl-d14	9	30-125		
VENO-SD05-000H^	2-fluorophenol	17	35-105	J/R	SSL
	phenol-d5	20	40-100		
	nitrobenzene-d5	9	35-100		
	2-fluorobiphenyl	0	45-105		
	2,4,6-tribromophenol	4	35-125		
	terphenyl-d14	6	30-125		
VENO-SD06-000H^	2-fluorophenol	17	35-105	J/R	SSL
	phenol-d5	20	40-100		
	nitrobenzene-d5	10	35-100		
	2-fluorobiphenyl	0	45-105		
	2,4,6-tribromophenol	4	35-125		
	terphenyl-d14	7	30-125		

**The initial analysis of the sample exhibited zero to 10% recoveries for all surrogates.*
^Samples were not re-analyzed, see e-mail from laboratory in SVOA worksheets.

Pesticides

The following samples exhibited non-compliant recoveries for the surrogates listed in the table below; qualifications were applied as noted.

Sample ID	Non-compliant Surrogate	% Rec	QC Limits	Qualifier	Q Code
VENO-SS02-0001	2,4,5,6-tetrachloro-m-xylene	41/40	70-125	J/UJ	SSL
	decachlorobiphenyl	48/42	55-130		
VENO-SS06-0001	2,4,5,6-tetrachloro-m-xylene	67/61	70-125		
VENO-SD04-000H	2,4,5,6-tetrachloro-m-xylene	62/59	70-125		
VENO-SD04-0H01	2,4,5,6-tetrachloro-m-xylene	27/25	70-125		
	decachlorobiphenyl	34/25	55-130		
VENO-SD05-000H	2,4,5,6-tetrachloro-m-xylene	17/21	70-125		
	decachlorobiphenyl	26/21	55-130		
VENO-SD06-000H	2,4,5,6-tetrachloro-m-xylene	35/35	70-125		
	decachlorobiphenyl	43/38	55-130		
VENO-SD07-000H	2,4,5,6-tetrachloro-m-xylene	22/20	70-125		
	decachlorobiphenyl	34/33	55-130		
VENO-SD07P-000H	2,4,5,6-tetrachloro-m-xylene	29/27	70-125		
	decachlorobiphenyl	39/35	55-130		

Matrix Spike Recoveries

Pesticides

The MS/MSD pair of sample VENO-SS02-0001 exhibited low recoveries for the compounds 4, 4'-DDE (54/59) and 4, 4'-DDT (33/39) in both spike aliquots. Therefore the compounds were qualified as estimated J/UJ with a qualifier code of MSL in the native sample only.

Identification/Quantitation

SVOA

Sample VENO-SD04-000H was re-analyzed due to low surrogate recoveries. The initial analysis exhibited below 10% recoveries for both fraction surrogates. The sample was re-extraction out of holding time and exhibited non-compliant surrogate recoveries. The recoveries however were above 10% for the acid fraction surrogates and therefore the re-analysis was used and the initial analysis was excluded.

Pesticides

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

Sample ID	Compound	Column Quant %D	Qualifier	Q Code
VENO-SD04-0004	4,4'-DDE	74.9	J	2C
	4,4'-DDD	61.4	J	
VENO-SD07-000H	4,4'-DDD	53.7	J	2C
VENO-SD07P-000H	4,4'-DDD	63.2	J	2C

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

Sincerely,

Jacqueline Cleveland

Jacqueline Cleveland
Vice-President

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag	Q Code
VENO-SD04-000H^, VENO-SD04-0H01, VENO-SD05-000H, VENO-SD06-000H	all results	+/-	J/UJ	%SOL
VENO-TB01-051713-SD, VENO-EB01-051713-SD	2-butanone 4-methyl-2-pentanone	+/-	J/R	ICL
VENO-SD04-000H	all results	+/-	J/UJ	SSL

^final qualifier due to non-compliant surrogate recoveries

SVOA

Sample ID	Compound	Results	Q flag	Q Code
VENO-SD04-000HRE^, VENO-SD04-0H01^, VENO-SD05-000H^, VENO-SD06-000H^	all results	+/-	J/UJ	%SOL
VENO-SD04-000HRE^	all results	+/-	J/UJ	HT
all samples	2,4-dinitrophenol 2-methyl-4,6-dinitrophenol	+/-	J/UJ	ICH
VENO-SD04-0H01^, VENO-SD05-000H^, VENO-SD06-000H^, VENO-SD07-000H, VENO-SD07P-000H	4-nitrophenol 2,4-dinitrotoluene 4-nitroaniline butylbenzylphthalate	+/-	J/UJ	CCH
VENO-EB01-051713-SD	4-nitroaniline	+/-	J/UJ	CCH
VENO-SD04-000HRE^	4-nitrophenol 4-nitroaniline	+/-	J/UJ	CCH
VENO-SD04-000HRE	all acid fraction compounds	+/-	J/UJ	SSL
	all base/neutral fraction compounds	+/-	J/R	SSL
VENO-SD04-0H01, VENO-SD05-000H, VENO-SD06-000H	all results	+/-	J/R	SSL
VENO-SD04-000H	all results	+/-	exclude	RE

^final qualifier due to non-compliant surrogate recoveries

Pesticides

Sample ID	Compound	Results	Q flag	Q Code
VENO-SD04-000H, VENO-SD04-0H01, VENO-SD05-000H, VENO-SD06-000H	all results	+/-	J/UJ	%SOL
VENO-SS02-0001RE1, VENO-SD07-000HRE1	all compounds	+/-	exclude	RE
all soil samples* except VENO-SS03-0001	all compounds	+/-	J/UJ	SSL
VENO-SS02-0001	4,4'-DDE 4,4'-DDT	+/-	J/UJ	MSL
all field soil samples	4,4'-DDT	+/-	J/UJ	CCL
VENO-SD04-0004	4,4'-DDE 4,4'-DDD	+	J	2C
VENO-SD07-000H	4,4'-DDD	+	J	2C
VENO-SD07P-000H	4,4'-DDD	+	J	2C

**Please note – the final qualifier for these samples is SSL due to low surrogate recoveries*

CH2M HILL
Vieques, PR – Laguna La Chiva SWMU 1
SDG# A302870

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

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

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

Organic Methods

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

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the ICB/CCB/PB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the LOD.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the LOD.
J/UJ -	Sample result is less than 10X LOD when blank result is below the negative LOD.

Glossary of Qualification Flags and Abbreviations, continued

Field QC Blank action:

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

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

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the FB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the FB value when the FB value is greater than the LOD.
J -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the LOD.

General Abbreviations

RL	reporting limit
MDL	method detection limit
IDL	instrument detection limit
LOD	Level of Detection
LOD	Level of Quantitation
+	positive result
-	non-detect result

QUALIFIER CODE REFERENCE

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

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-SD04-000H

Laboratory:	ENCO Orlando			SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)			Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Sediment	Laboratory ID:	A302870-05	File ID:	2EQ006.D
Sampled:	05/17/13 08:35	Prepared:	05/22/13 13:16	Analyzed:	05/22/13 14:15
Solids:	23.85	Preparation:	EPA 5030B_MS	Initial/Final:	3.64 g / 5 mL

Batch: 3E22013 Sequence: AA24269 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0058	U UJ	0.0036	0.0058	0.012
74-87-3	Chloromethane	1	<0.0058	U	0.0037	0.0058	0.012
75-01-4	Vinyl chloride	1	<0.0058	U	0.0025	0.0058	0.012
74-83-9	Bromomethane	1	<0.029	U	0.0052	0.029	0.058
75-00-3	Chloroethane	1	<0.0058	U	0.0031	0.0058	0.012
75-69-4	Trichlorofluoromethane	1	<0.0058	U	0.0031	0.0058	0.012
76-13-1	Freon 113	1	<0.0058	U	0.0035	0.0058	0.012
67-64-1	Acetone	1	0.12	J J	0.0098	0.072	0.14
75-35-4	1,1-Dichloroethene	1	<0.0058	U UJ	0.0036	0.0058	0.012
75-15-0	Carbon disulfide	1	0.051	J J	0.012	0.029	0.058
75-09-2	Methylene Chloride	1	<0.029	U UJ	0.0040	0.029	0.058
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0058	U	0.0016	0.0058	0.012
156-60-5	trans-1,2-Dichloroethene	1	<0.0058	U	0.0040	0.0058	0.012
156-59-2	cis-1,2-Dichloroethene	1	<0.0058	U	0.0031	0.0058	0.012
75-34-3	1,1-Dichloroethane	1	<0.0058	U	0.0033	0.0058	0.012
78-93-3	2-Butanone	1	0.023	J J	0.010	0.014	0.029
67-66-3	Chloroform	1	<0.0058	U UJ	0.0025	0.0058	0.012
74-97-5	Bromochloromethane	1	<0.0058	U	0.0020	0.0058	0.012
71-55-6	1,1,1-Trichloroethane	1	<0.0058	U	0.0020	0.0058	0.012
79-20-9	Methyl acetate	1	<0.029	U	0.0092	0.029	0.058
110-82-7	Cyclohexane	1	<0.0058	U	0.0031	0.0058	0.012
108-87-2	Methyl cyclohexane	1	<0.0058	U	0.0030	0.0058	0.012
56-23-5	Carbon Tetrachloride	1	<0.0058	U	0.0035	0.0058	0.012
107-06-2	1,2-Dichloroethane	1	<0.0058	U	0.0018	0.0058	0.012
71-43-2	Benzene	1	<0.0058	U	0.0023	0.0058	0.012
79-01-6	Trichloroethene	1	<0.0058	U	0.0029	0.0058	0.012
78-87-5	1,2-Dichloropropane	1	<0.0058	U	0.0032	0.0058	0.012
75-27-4	Bromodichloromethane	1	<0.0058	U	0.0020	0.0058	0.012
108-10-1	4-Methyl-2-pentanone	1	<0.014	U	0.0081	0.014	0.029
591-78-6	2-Hexanone	1	<0.014	U	0.0052	0.014	0.029
10061-01-5	cis-1,3-Dichloropropene	1	<0.0058	U	0.0017	0.0058	0.012
108-88-3	Toluene	1	<0.0058	U	0.0026	0.0058	0.012
10061-02-6	trans-1,3-Dichloropropene	1	<0.0058	U	0.0018	0.0058	0.012
79-00-5	1,1,2-Trichloroethane	1	<0.0058	U	0.0035	0.0058	0.012

SSL

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012

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-SD04-000H

Laboratory:	ENCO Orlando			SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)			Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Sediment	Laboratory ID:	A302870-05	File ID:	2EQ006.D
Sampled:	05/17/13 08:35	Prepared:	05/22/13 13:16	Analyzed:	05/22/13 14:15
Solids:	23.85	Preparation:	EPA 5030B_MS	Initial/Final:	3.64 g / 5 mL

Batch: 3E22013 Sequence: AA24269 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0058	U UJ	0.0028	0.0058	0.012
124-48-1	Dibromochloromethane	1	<0.0058	U	0.0015	0.0058	0.012
106-93-4	1,2-Dibromoethane	1	<0.0058	U	0.0018	0.0058	0.012
108-90-7	Chlorobenzene	1	<0.0058	U	0.0028	0.0058	0.012
100-41-4	Ethylbenzene	1	<0.0058	U	0.0032	0.0058	0.012
108-38-3/106-42-3	m,p-Xylenes	1	<0.012	U	0.0057	0.012	0.023
95-47-6	o-Xylene	1	<0.0058	U	0.0030	0.0058	0.012
75-25-2	Bromoform	1	<0.0058	U	0.0017	0.0058	0.012
100-42-5	Styrene	1	<0.0058	U	0.0025	0.0058	0.012
98-82-8	Isopropylbenzene	1	<0.0058	U	0.0031	0.0058	0.012
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0058	U	0.0017	0.0058	0.012
120-82-1	1,2,4-Trichlorobenzene	1	<0.0058	U	0.0049	0.0058	0.012
541-73-1	1,3-Dichlorobenzene	1	<0.0058	U	0.0027	0.0058	0.012
106-46-7	1,4-Dichlorobenzene	1	<0.0058	U	0.0026	0.0058	0.012
95-50-1	1,2-Dichlorobenzene	1	<0.0058	U	0.0025	0.0058	0.012
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0058	U	0.0033	0.0058	0.012
87-61-6	1,2,3-Trichlorobenzene	1	<0.0058	U	0.0052	0.0058	0.012

SSL

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.288	0.24	83	74 - 133	
Toluene-d8	0.288	0.26	92	85 - 115	
4-Bromofluorobenzene	0.288	0.24	82	85 - 120	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1197612	11.32	1249106	11.31	
1,4-Difluorobenzene	1842332	11.89	1940286	11.88	
Chlorobenzene-d5	1559947	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	699356	16.9	841846	16.89	

* Values outside of QC limits

MM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-SD04-0H01

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-06	File ID:	2EQ007.D
Sampled:	05/17/13 08:20	Prepared:	05/22/13 13:16	Analyzed:	05/22/13 14:48
Solids:	31.55	Preparation:	EPA 5030B_MS	Initial/Final:	4.17 g / 5 mL

Batch: 3E22013 Sequence: AA24269 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ	
75-71-8	Dichlorodifluoromethane	1	<0.0038	U UJ	0.0024	0.0038	0.0076	%SOL
74-87-3	Chloromethane	1	<0.0038	U	0.0025	0.0038	0.0076	
75-01-4	Vinyl chloride	1	<0.0038	U	0.0017	0.0038	0.0076	
74-83-9	Bromomethane	1	<0.019	U	0.0034	0.019	0.038	
75-00-3	Chloroethane	1	<0.0038	U	0.0021	0.0038	0.0076	
75-69-4	Trichlorofluoromethane	1	<0.0038	U	0.0021	0.0038	0.0076	
76-13-1	Freon 113	1	<0.0038	U	0.0023	0.0038	0.0076	
67-64-1	Acetone	1	0.071	J J	0.0065	0.048	0.095	
75-35-4	1,1-Dichloroethene	1	<0.0038	U UJ	0.0024	0.0038	0.0076	
75-15-0	Carbon disulfide	1	0.085	J	0.0080	0.019	0.038	
75-09-2	Methylene Chloride	1	<0.019	U UJ	0.0026	0.019	0.038	
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0038	U	0.0010	0.0038	0.0076	
156-60-5	trans-1,2-Dichloroethene	1	<0.0038	U	0.0026	0.0038	0.0076	
156-59-2	cis-1,2-Dichloroethene	1	<0.0038	U	0.0020	0.0038	0.0076	
75-34-3	1,1-Dichloroethane	1	<0.0038	U	0.0022	0.0038	0.0076	
78-93-3	2-Butanone	1	0.013	J J	0.0068	0.0095	0.019	
67-66-3	Chloroform	1	<0.0038	U UJ	0.0016	0.0038	0.0076	
74-97-5	Bromochloromethane	1	<0.0038	U	0.0013	0.0038	0.0076	
71-55-6	1,1,1-Trichloroethane	1	<0.0038	U	0.0013	0.0038	0.0076	
79-20-9	Methyl acetate	1	<0.019	U	0.0061	0.019	0.038	
110-82-7	Cyclohexane	1	<0.0038	U	0.0020	0.0038	0.0076	
108-87-2	Methyl cyclohexane	1	<0.0038	U	0.0020	0.0038	0.0076	
56-23-5	Carbon Tetrachloride	1	<0.0038	U	0.0023	0.0038	0.0076	
107-06-2	1,2-Dichloroethane	1	<0.0038	U	0.0012	0.0038	0.0076	
71-43-2	Benzene	1	<0.0038	U	0.0015	0.0038	0.0076	
79-01-6	Trichloroethene	1	<0.0038	U	0.0019	0.0038	0.0076	
78-87-5	1,2-Dichloropropane	1	<0.0038	U	0.0021	0.0038	0.0076	
75-27-4	Bromodichloromethane	1	<0.0038	U	0.0013	0.0038	0.0076	
108-10-1	4-Methyl-2-pentanone	1	<0.0095	U	0.0053	0.0095	0.019	
591-78-6	2-Hexanone	1	<0.0095	U	0.0035	0.0095	0.019	
10061-01-5	cis-1,3-Dichloropropene	1	<0.0038	U	0.0011	0.0038	0.0076	
108-88-3	Toluene	1	<0.0038	U	0.0017	0.0038	0.0076	
10061-02-6	trans-1,3-Dichloropropene	1	<0.0038	U	0.0012	0.0038	0.0076	
79-00-5	1,1,2-Trichloroethane	1	<0.0038	U	0.0023	0.0038	0.0076	

070913

014

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-SD04-0H01

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-06	File ID:	2EQ007.D
Sampled:	05/17/13 08:20	Prepared:	05/22/13 13:16	Analyzed:	05/22/13 14:48
Solids:	31.55	Preparation:	EPA 5030B_MS	Initial/Final:	4.17 g / 5 mL

Batch: 3E22013 Sequence: AA24269 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0038	U UJ	0.0019	0.0038	0.0076
124-48-1	Dibromochloromethane	1	<0.0038	U	0.0010	0.0038	0.0076
106-93-4	1,2-Dibromoethane	1	<0.0038	U	0.0012	0.0038	0.0076
108-90-7	Chlorobenzene	1	<0.0038	U	0.0018	0.0038	0.0076
100-41-4	Ethylbenzene	1	<0.0038	U	0.0021	0.0038	0.0076
108-38-3/106-42-3	m,p-Xylenes	1	<0.0076	U	0.0038	0.0076	0.015
95-47-6	o-Xylene	1	<0.0038	U	0.0020	0.0038	0.0076
75-25-2	Bromoform	1	<0.0038	U	0.0011	0.0038	0.0076
100-42-5	Styrene	1	<0.0038	U	0.0017	0.0038	0.0076
98-82-8	Isopropylbenzene	1	<0.0038	U	0.0021	0.0038	0.0076
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0038	U	0.0011	0.0038	0.0076
120-82-1	1,2,4-Trichlorobenzene	1	<0.0038	U	0.0032	0.0038	0.0076
541-73-1	1,3-Dichlorobenzene	1	<0.0038	U	0.0018	0.0038	0.0076
106-46-7	1,4-Dichlorobenzene	1	<0.0038	U	0.0017	0.0038	0.0076
95-50-1	1,2-Dichlorobenzene	1	<0.0038	U	0.0017	0.0038	0.0076
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0038	U	0.0022	0.0038	0.0076
87-61-6	1,2,3-Trichlorobenzene	1	<0.0038	U	0.0035	0.0038	0.0076

1.5x

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.190	0.16	86	74 - 133	
Toluene-d8	0.190	0.18	97	85 - 115	
4-Bromofluorobenzene	0.190	0.16	87	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1200163	11.32	1249106	11.31	
1,4-Difluorobenzene	1846853	11.89	1940286	11.88	
Chlorobenzene-d5	1574759	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	722759	16.9	841846	16.89	

* Values outside of QC limits

MM 07/09/13

015

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-SD05-000H

Laboratory: ENCO Orlando | SDG: A302870-CTO0037

Client: CH2M Hill, Inc. (CH029) | Project: East Vieques La Chiva SWMU 1, CTO-0037

Matrix: Sediment | Laboratory ID: A302870-07 | File ID: 2EQ008.D

Sampled: 05/17/13 09:10 | Prepared: 05/22/13 13:16 | Analyzed: 05/22/13 15:20

Solids: 27.82 | Preparation: EPA 5030B_MS | Initial/Final: 3.57 g / 5 mL

Batch: 3E22013 | Sequence: AA24269 | Calibration: 1301045 | Instrument: QVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0050	U UJ	0.0031	0.0050	0.010
74-87-3	Chloromethane	1	<0.0050	U	0.0033	0.0050	0.010
75-01-4	Vinyl chloride	1	<0.0050	U	0.0022	0.0050	0.010
74-83-9	Bromomethane	1	<0.025	U	0.0045	0.025	0.050
75-00-3	Chloroethane	1	<0.0050	U	0.0027	0.0050	0.010
75-69-4	Trichlorofluoromethane	1	<0.0050	U	0.0027	0.0050	0.010
76-13-1	Freon 113	1	<0.0050	U	0.0030	0.0050	0.010
67-64-1	Acetone	1	0.13	J	0.0086	0.063	0.13
75-35-4	1,1-Dichloroethene	1	<0.0050	U UJ	0.0031	0.0050	0.010
75-15-0	Carbon disulfide	1	0.016	J	0.011	0.025	0.050
75-09-2	Methylene Chloride	1	<0.025	U UJ	0.0035	0.025	0.050
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0050	U	0.0014	0.0050	0.010
156-60-5	trans-1,2-Dichloroethene	1	<0.0050	U	0.0035	0.0050	0.010
156-59-2	cis-1,2-Dichloroethene	1	<0.0050	U	0.0027	0.0050	0.010
75-34-3	1,1-Dichloroethane	1	<0.0050	U	0.0029	0.0050	0.010
78-93-3	2-Butanone	1	0.025	J	0.0091	0.013	0.025
67-66-3	Chloroform	1	<0.0050	U UJ	0.0022	0.0050	0.010
74-97-5	Bromochloromethane	1	<0.0050	U	0.0018	0.0050	0.010
71-55-6	1,1,1-Trichloroethane	1	<0.0050	U	0.0018	0.0050	0.010
79-20-9	Methyl acetate	1	<0.025	U	0.0081	0.025	0.050
110-82-7	Cyclohexane	1	<0.0050	U	0.0027	0.0050	0.010
108-87-2	Methyl cyclohexane	1	<0.0050	U	0.0026	0.0050	0.010
56-23-5	Carbon Tetrachloride	1	<0.0050	U	0.0030	0.0050	0.010
107-06-2	1,2-Dichloroethane	1	<0.0050	U	0.0016	0.0050	0.010
71-43-2	Benzene	1	<0.0050	U	0.0020	0.0050	0.010
79-01-6	Trichloroethene	1	<0.0050	U	0.0025	0.0050	0.010
78-87-5	1,2-Dichloropropane	1	<0.0050	U	0.0028	0.0050	0.010
75-27-4	Bromodichloromethane	1	<0.0050	U	0.0018	0.0050	0.010
108-10-1	4-Methyl-2-pentanone	1	<0.013	U	0.0070	0.013	0.025
591-78-6	2-Hexanone	1	<0.013	U	0.0046	0.013	0.025
10061-01-5	cis-1,3-Dichloropropene	1	<0.0050	U	0.0015	0.0050	0.010
108-88-3	Toluene	1	<0.0050	U	0.0023	0.0050	0.010
10061-02-6	trans-1,3-Dichloropropene	1	<0.0050	U	0.0016	0.0050	0.010
79-00-5	1,1,2-Trichloroethane	1	<0.0050	U	0.0030	0.0050	0.010

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016

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-SD05-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-07	File ID:	2EQ008.D
Sampled:	05/17/13 09:10	Prepared:	05/22/13 13:16	Analyzed:	05/22/13 15:20
Solids:	27.82	Preparation:	EPA 5030B_MS	Initial/Final:	3.57 g / 5 mL

Batch: 3E22013 Sequence: AA24269 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0050	U UJ	0.0025	0.0050	0.010 1/.501
124-48-1	Dibromochloromethane	1	<0.0050	U	0.0013	0.0050	0.010
106-93-4	1,2-Dibromoethane	1	<0.0050	U	0.0016	0.0050	0.010
108-90-7	Chlorobenzene	1	<0.0050	U	0.0024	0.0050	0.010
100-41-4	Ethylbenzene	1	<0.0050	U	0.0028	0.0050	0.010
108-38-3/106-42-3	m,p-Xylenes	1	<0.010	U	0.0050	0.010	0.020
95-47-6	o-Xylene	1	<0.0050	U	0.0026	0.0050	0.010
75-25-2	Bromoform	1	<0.0050	U	0.0015	0.0050	0.010
100-42-5	Styrene	1	<0.0050	U	0.0022	0.0050	0.010
98-82-8	Isopropylbenzene	1	<0.0050	U	0.0027	0.0050	0.010
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0050	U	0.0015	0.0050	0.010
120-82-1	1,2,4-Trichlorobenzene	1	<0.0050	U	0.0043	0.0050	0.010
541-73-1	1,3-Dichlorobenzene	1	<0.0050	U	0.0024	0.0050	0.010
106-46-7	1,4-Dichlorobenzene	1	<0.0050	U	0.0023	0.0050	0.010
95-50-1	1,2-Dichlorobenzene	1	<0.0050	U	0.0022	0.0050	0.010
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0050	U	0.0029	0.0050	0.010
87-61-6	1,2,3-Trichlorobenzene	1	<0.0050	U	0.0046	0.0050	0.010

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.252	0.21	85	74 - 133	
Toluene-d8	0.252	0.24	95	85 - 115	
4-Bromofluorobenzene	0.252	0.22	86	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1205177	11.32	1249106	11.31	
1,4-Difluorobenzene	1848686	11.89	1940286	11.88	
Chlorobenzene-d5	1579801	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	716903	16.9	841846	16.89	

* Values outside of QC limits

WM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-SD06-000H

Laboratory: ENCO Orlando | SDG: A302870-CTO0037

Client: CH2M Hill, Inc. (CH029) | Project: East Vieques La Chiva SWMU 1, CTO-0037

Matrix: Sediment | Laboratory ID: A302870-08 | File ID: 2EQ009.D

Sampled: 05/17/13 09:35 | Prepared: 05/22/13 13:16 | Analyzed: 05/22/13 15:52

Solids: 36.91 | Preparation: EPA 5030B_MS | Initial/Final: 3.46 g / 5 mL

Batch: 3E22013 | Sequence: AA24269 | Calibration: 1301045 | Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0039	U UJ	0.0024	0.0039	0.0078
74-87-3	Chloromethane	1	<0.0039	U	0.0025	0.0039	0.0078
75-01-4	Vinyl chloride	1	<0.0039	U	0.0017	0.0039	0.0078
74-83-9	Bromomethane	1	<0.020	U	0.0035	0.020	0.039
75-00-3	Chloroethane	1	<0.0039	U	0.0021	0.0039	0.0078
75-69-4	Trichlorofluoromethane	1	<0.0039	U	0.0021	0.0039	0.0078
76-13-1	Freon 113	1	<0.0039	U	0.0023	0.0039	0.0078
67-64-1	Acetone	1	0.24	J	0.0067	0.049	0.098
75-35-4	1,1-Dichloroethene	1	<0.0039	U UJ	0.0024	0.0039	0.0078
75-15-0	Carbon disulfide	1	0.020	J	0.0082	0.020	0.039
75-09-2	Methylene Chloride	1	<0.020	U UJ	0.0027	0.020	0.039
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0039	U	0.0011	0.0039	0.0078
156-60-5	trans-1,2-Dichloroethene	1	<0.0039	U	0.0027	0.0039	0.0078
156-59-2	cis-1,2-Dichloroethene	1	<0.0039	U	0.0021	0.0039	0.0078
75-34-3	1,1-Dichloroethane	1	<0.0039	U	0.0022	0.0039	0.0078
78-93-3	2-Butanone	1	0.056	J	0.0070	0.0098	0.020
67-66-3	Chloroform	1	<0.0039	U UJ	0.0017	0.0039	0.0078
74-97-5	Bromochloromethane	1	<0.0039	U	0.0014	0.0039	0.0078
71-55-6	1,1,1-Trichloroethane	1	<0.0039	U	0.0014	0.0039	0.0078
79-20-9	Methyl acetate	1	<0.020	U	0.0063	0.020	0.039
110-82-7	Cyclohexane	1	<0.0039	U	0.0021	0.0039	0.0078
108-87-2	Methyl cyclohexane	1	<0.0039	U	0.0020	0.0039	0.0078
56-23-5	Carbon Tetrachloride	1	<0.0039	U	0.0023	0.0039	0.0078
107-06-2	1,2-Dichloroethane	1	<0.0039	U	0.0013	0.0039	0.0078
71-43-2	Benzene	1	<0.0039	U	0.0016	0.0039	0.0078
79-01-6	Trichloroethene	1	<0.0039	U	0.0020	0.0039	0.0078
78-87-5	1,2-Dichloropropane	1	<0.0039	U	0.0022	0.0039	0.0078
75-27-4	Bromodichloromethane	1	<0.0039	U	0.0014	0.0039	0.0078
108-10-1	4-Methyl-2-pentanone	1	<0.0098	U	0.0055	0.0098	0.020
591-78-6	2-Hexanone	1	<0.0098	U	0.0036	0.0098	0.020
10061-01-5	cis-1,3-Dichloropropene	1	<0.0039	U	0.0012	0.0039	0.0078
108-88-3	Toluene	1	<0.0039	U	0.0018	0.0039	0.0078
10061-02-6	trans-1,3-Dichloropropene	1	<0.0039	U	0.0012	0.0039	0.0078
79-00-5	1,1,2-Trichloroethane	1	<0.0039	U	0.0023	0.0039	0.0078

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WM 07/09/13

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-SD06-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-08	File ID:	2EQ009.D
Sampled:	05/17/13 09:35	Prepared:	05/22/13 13:16	Analyzed:	05/22/13 15:52
Solids:	36.91	Preparation:	EPA 5030B_MS	Initial/Final:	3.46 g / 5 mL

Batch: 3E22013 Sequence: AA24269 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0039	U UJ	0.0019	0.0039	0.0078
124-48-1	Dibromochloromethane	1	<0.0039	U	0.0010	0.0039	0.0078
106-93-4	1,2-Dibromoethane	1	<0.0039	U	0.0012	0.0039	0.0078
108-90-7	Chlorobenzene	1	<0.0039	U	0.0019	0.0039	0.0078
100-41-4	Ethylbenzene	1	<0.0039	U	0.0022	0.0039	0.0078
108-38-3/106-42-3	m,p-Xylenes	1	<0.0078	U	0.0039	0.0078	0.016
95-47-6	o-Xylene	1	<0.0039	U	0.0020	0.0039	0.0078
75-25-2	Bromoform	1	<0.0039	U	0.0012	0.0039	0.0078
100-42-5	Styrene	1	<0.0039	U	0.0017	0.0039	0.0078
98-82-8	Isopropylbenzene	1	<0.0039	U	0.0021	0.0039	0.0078
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0039	U	0.0012	0.0039	0.0078
120-82-1	1,2,4-Trichlorobenzene	1	<0.0039	U	0.0033	0.0039	0.0078
541-73-1	1,3-Dichlorobenzene	1	<0.0039	U	0.0018	0.0039	0.0078
106-46-7	1,4-Dichlorobenzene	1	<0.0039	U	0.0018	0.0039	0.0078
95-50-1	1,2-Dichlorobenzene	1	<0.0039	U	0.0017	0.0039	0.0078
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0039	U	0.0022	0.0039	0.0078
87-61-6	1,2,3-Trichlorobenzene	1	<0.0039	U	0.0036	0.0039	0.0078

1.5QL

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.196	0.17	86	74 - 133	
Toluene-d8	0.196	0.19	97	85 - 115	
4-Bromofluorobenzene	0.196	0.17	88	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1199462	11.31	1249106	11.31	
1,4-Difluorobenzene	1819942	11.89	1940286	11.88	
Chlorobenzene-d5	1572565	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	715382	16.89	841846	16.89	

* Values outside of QC limits

WK 07/09/13

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-SD07-000H

Laboratory:	ENCO Orlando			SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)			Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Sediment	Laboratory ID:	A302870-09	File ID:	2EQ010.D
Sampled:	05/17/13 10:15	Prepared:	05/22/13 13:16	Analyzed:	05/22/13 16:24
Solids:	75.70	Preparation:	EPA 5030B_MS	Initial/Final:	5.96 g / 5 mL

Batch: 3E22013 Sequence: AA24269 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0011	U	0.0007	0.0011	0.0022
74-87-3	Chloromethane	1	<0.0011	U	0.0007	0.0011	0.0022
75-01-4	Vinyl chloride	1	<0.0011	U	0.0005	0.0011	0.0022
74-83-9	Bromomethane	1	<0.0055	U	0.0010	0.0055	0.011
75-00-3	Chloroethane	1	<0.0011	U	0.0006	0.0011	0.0022
75-69-4	Trichlorofluoromethane	1	<0.0011	U	0.0006	0.0011	0.0022
76-13-1	Freon 113	1	<0.0011	U	0.0007	0.0011	0.0022
67-64-1	Acetone	1	0.0078	J	0.0019	0.014	0.028
75-35-4	1,1-Dichloroethene	1	<0.0011	U	0.0007	0.0011	0.0022
75-15-0	Carbon disulfide	1	0.0048	J	0.0023	0.0055	0.011
75-09-2	Methylene Chloride	1	<0.0055	U	0.0008	0.0055	0.011
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0011	U	0.0003	0.0011	0.0022
156-60-5	trans-1,2-Dichloroethene	1	<0.0011	U	0.0008	0.0011	0.0022
156-59-2	cis-1,2-Dichloroethene	1	<0.0011	U	0.0006	0.0011	0.0022
75-34-3	1,1-Dichloroethane	1	<0.0011	U	0.0006	0.0011	0.0022
78-93-3	2-Butanone	1	<0.0028	U	0.0020	0.0028	0.0055
67-66-3	Chloroform	1	<0.0011	U	0.0005	0.0011	0.0022
74-97-5	Bromochloromethane	1	<0.0011	U	0.0004	0.0011	0.0022
71-55-6	1,1,1-Trichloroethane	1	<0.0011	U	0.0004	0.0011	0.0022
79-20-9	Methyl acetate	1	<0.0055	U	0.0018	0.0055	0.011
110-82-7	Cyclohexane	1	<0.0011	U	0.0006	0.0011	0.0022
108-87-2	Methyl cyclohexane	1	<0.0011	U	0.0006	0.0011	0.0022
56-23-5	Carbon Tetrachloride	1	<0.0011	U	0.0007	0.0011	0.0022
107-06-2	1,2-Dichloroethane	1	<0.0011	U	0.0004	0.0011	0.0022
71-43-2	Benzene	1	<0.0011	U	0.0004	0.0011	0.0022
79-01-6	Trichloroethene	1	<0.0011	U	0.0006	0.0011	0.0022
78-87-5	1,2-Dichloropropane	1	<0.0011	U	0.0006	0.0011	0.0022
75-27-4	Bromodichloromethane	1	<0.0011	U	0.0004	0.0011	0.0022
108-10-1	4-Methyl-2-pentanone	1	<0.0028	U	0.0016	0.0028	0.0055
591-78-6	2-Hexanone	1	<0.0028	U	0.0010	0.0028	0.0055
10061-01-5	cis-1,3-Dichloropropene	1	<0.0011	U	0.0003	0.0011	0.0022
108-88-3	Toluene	1	<0.0011	U	0.0005	0.0011	0.0022
10061-02-6	trans-1,3-Dichloropropene	1	<0.0011	U	0.0003	0.0011	0.0022
79-00-5	1,1,2-Trichloroethane	1	<0.0011	U	0.0007	0.0011	0.0022

070913

020

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-SD07-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-09	File ID:	2EQ010.D
Sampled:	05/17/13 10:15	Prepared:	05/22/13 13:16	Analyzed:	05/22/13 16:24
Solids:	75.70	Preparation:	EPA 5030B_MS	Initial/Final:	5.96 g / 5 mL

Batch: 3E22013 Sequence: AA24269 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0011	U	0.0005	0.0011	0.0022
124-48-1	Dibromochloromethane	1	<0.0011	U	0.0003	0.0011	0.0022
106-93-4	1,2-Dibromoethane	1	<0.0011	U	0.0003	0.0011	0.0022
108-90-7	Chlorobenzene	1	<0.0011	U	0.0005	0.0011	0.0022
100-41-4	Ethylbenzene	1	<0.0011	U	0.0006	0.0011	0.0022
108-38-3/106-42-3	m,p-Xylenes	1	<0.0022	U	0.0011	0.0022	0.0044
95-47-6	o-Xylene	1	<0.0011	U	0.0006	0.0011	0.0022
75-25-2	Bromoform	1	<0.0011	U	0.0003	0.0011	0.0022
100-42-5	Styrene	1	<0.0011	U	0.0005	0.0011	0.0022
98-82-8	Isopropylbenzene	1	<0.0011	U	0.0006	0.0011	0.0022
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0011	U	0.0003	0.0011	0.0022
120-82-1	1,2,4-Trichlorobenzene	1	<0.0011	U	0.0009	0.0011	0.0022
541-73-1	1,3-Dichlorobenzene	1	<0.0011	U	0.0005	0.0011	0.0022
106-46-7	1,4-Dichlorobenzene	1	<0.0011	U	0.0005	0.0011	0.0022
95-50-1	1,2-Dichlorobenzene	1	<0.0011	U	0.0005	0.0011	0.0022
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0011	U	0.0006	0.0011	0.0022
87-61-6	1,2,3-Trichlorobenzene	1	<0.0011	U	0.0010	0.0011	0.0022

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.0554	0.050	90	74 - 133	
Toluene-d8	0.0554	0.056	100	85 - 115	
4-Bromofluorobenzene	0.0554	0.051	92	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1183019	11.32	1249106	11.31	
1,4-Difluorobenzene	1809646	11.89	1940286	11.88	
Chlorobenzene-d5	1568495	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	723592	16.9	841846	16.89	

* Values outside of QC limits

VM 070413

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-SD07P-000H

Laboratory:	ENCO Orlando			SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)			Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Sediment	Laboratory ID:	A302870-10	File ID:	2EQ011.D
Sampled:	05/17/13 10:15	Prepared:	05/22/13 13:16	Analyzed:	05/22/13 16:56
Solids:	76.16	Preparation:	EPA 5030B_MS	Initial/Final:	5.49 g / 5 mL
Batch:	3E22013	Sequence:	AA24269	Calibration:	1301045
Instrument:	OVGCMS2				

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<0.0013	U	0.0008	0.0013	0.0026
74-87-3	Chloromethane	1	<0.0013	U	0.0009	0.0013	0.0026
75-01-4	Vinyl chloride	1	<0.0013	U	0.0006	0.0013	0.0026
74-83-9	Bromomethane	1	<0.0066	U	0.0012	0.0066	0.013
75-00-3	Chloroethane	1	<0.0013	U	0.0007	0.0013	0.0026
75-69-4	Trichlorofluoromethane	1	<0.0013	U	0.0007	0.0013	0.0026
76-13-1	Freon 113	1	<0.0013	U	0.0008	0.0013	0.0026
67-64-1	Acetone	1	0.0081	J	0.0022	0.016	0.033
75-35-4	1,1-Dichloroethene	1	<0.0013	U	0.0008	0.0013	0.0026
75-15-0	Carbon disulfide	1	0.0041	J	0.0028	0.0066	0.013
75-09-2	Methylene Chloride	1	<0.0066	U	0.0009	0.0066	0.013
1634-04-4	Methyl-tert-Butyl Ether	1	<0.0013	U	0.0004	0.0013	0.0026
156-60-5	trans-1,2-Dichloroethene	1	<0.0013	U	0.0009	0.0013	0.0026
156-59-2	cis-1,2-Dichloroethene	1	<0.0013	U	0.0007	0.0013	0.0026
75-34-3	1,1-Dichloroethane	1	<0.0013	U	0.0007	0.0013	0.0026
78-93-3	2-Butanone	1	<0.0033	U	0.0024	0.0033	0.0066
67-66-3	Chloroform	1	<0.0013	U	0.0006	0.0013	0.0026
74-97-5	Bromochloromethane	1	<0.0013	U	0.0005	0.0013	0.0026
71-55-6	1,1,1-Trichloroethane	1	<0.0013	U	0.0005	0.0013	0.0026
79-20-9	Methyl acetate	1	<0.0066	U	0.0021	0.0066	0.013
110-82-7	Cyclohexane	1	<0.0013	U	0.0007	0.0013	0.0026
108-87-2	Methyl cyclohexane	1	<0.0013	U	0.0007	0.0013	0.0026
56-23-5	Carbon Tetrachloride	1	<0.0013	U	0.0008	0.0013	0.0026
107-06-2	1,2-Dichloroethane	1	<0.0013	U	0.0004	0.0013	0.0026
71-43-2	Benzene	1	<0.0013	U	0.0005	0.0013	0.0026
79-01-6	Trichloroethene	1	<0.0013	U	0.0007	0.0013	0.0026
78-87-5	1,2-Dichloropropane	1	<0.0013	U	0.0007	0.0013	0.0026
75-27-4	Bromodichloromethane	1	<0.0013	U	0.0005	0.0013	0.0026
108-10-1	4-Methyl-2-pentanone	1	<0.0033	U	0.0018	0.0033	0.0066
591-78-6	2-Hexanone	1	<0.0033	U	0.0012	0.0033	0.0066
10061-01-5	cis-1,3-Dichloropropene	1	<0.0013	U	0.0004	0.0013	0.0026
108-88-3	Toluene	1	<0.0013	U	0.0006	0.0013	0.0026
10061-02-6	trans-1,3-Dichloropropene	1	<0.0013	U	0.0004	0.0013	0.0026
79-00-5	1,1,2-Trichloroethane	1	<0.0013	U	0.0008	0.0013	0.0026

070113

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-SD07P-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-10	File ID:	2EQ011.D
Sampled:	05/17/13 10:15	Prepared:	05/22/13 13:16	Analyzed:	05/22/13 16:56
Solids:	76.16	Preparation:	EPA 5030B_MS	Initial/Final:	5.49 g / 5 mL

Batch: 3E22013 Sequence: AA24269 Calibration: 1301045 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<0.0013	U	0.0006	0.0013	0.0026
124-48-1	Dibromochloromethane	1	<0.0013	U	0.0003	0.0013	0.0026
106-93-4	1,2-Dibromoethane	1	<0.0013	U	0.0004	0.0013	0.0026
108-90-7	Chlorobenzene	1	<0.0013	U	0.0006	0.0013	0.0026
100-41-4	Ethylbenzene	1	<0.0013	U	0.0007	0.0013	0.0026
108-38-3/106-42-3	m,p-Xylenes	1	<0.0026	U	0.0013	0.0026	0.0053
95-47-6	o-Xylene	1	<0.0013	U	0.0007	0.0013	0.0026
75-25-2	Bromoform	1	<0.0013	U	0.0004	0.0013	0.0026
100-42-5	Styrene	1	<0.0013	U	0.0006	0.0013	0.0026
98-82-8	Isopropylbenzene	1	<0.0013	U	0.0007	0.0013	0.0026
79-34-5	1,1,2,2-Tetrachloroethane	1	<0.0013	U	0.0004	0.0013	0.0026
120-82-1	1,2,4-Trichlorobenzene	1	<0.0013	U	0.0011	0.0013	0.0026
541-73-1	1,3-Dichlorobenzene	1	<0.0013	U	0.0006	0.0013	0.0026
106-46-7	1,4-Dichlorobenzene	1	<0.0013	U	0.0006	0.0013	0.0026
95-50-1	1,2-Dichlorobenzene	1	<0.0013	U	0.0006	0.0013	0.0026
96-12-8	1,2-Dibromo-3-chloropropane	1	<0.0013	U	0.0007	0.0013	0.0026
87-61-6	1,2,3-Trichlorobenzene	1	<0.0013	U	0.0012	0.0013	0.0026

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
Dibromofluoromethane	0.0598	0.053	88	74 - 133	
Toluene-d8	0.0598	0.059	100	85 - 115	
4-Bromofluorobenzene	0.0598	0.055	92	85 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1195278	11.31	1249106	11.31	
1,4-Difluorobenzene	1819577	11.89	1940286	11.88	
Chlorobenzene-d5	1555221	14.56	1665139	14.55	
1,4-Dichlorobenzene-d4	731937	16.89	841846	16.89	

* Values outside of QC limits

WM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-EB01-051713-SD

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302870-11	File ID:	3ES006.D
Sampled:	05/17/13 07:00	Prepared:	05/24/13 12:57	Analyzed:	05/24/13 16:14
Solids:		Preparation:	EPA 5030B MS	Initial/Final:	5 mL / 5 mL

Batch: 3E24030 Sequence: AA24312 Calibration: 1304028 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<1.0	U	0.74	1.0	2.0
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0
75-01-4	Vinyl chloride	1	<1.0	U	0.71	1.0	2.0
74-83-9	Bromomethane	1	<1.0	U	0.95	1.0	2.0
75-00-3	Chloroethane	1	<1.0	U	0.98	1.0	2.0
75-69-4	Trichlorofluoromethane	1	<1.0	U	0.94	1.0	2.0
76-13-1	Freon 113	1	<1.0	U	0.73	1.0	2.0
67-64-1	Acetone	1	<12	U	1.8	12	25
75-35-4	1,1-Dichloroethene	1	<1.0	U	0.94	1.0	2.0
75-15-0	Carbon disulfide	1	<5.0	U	2.6	5.0	10
75-09-2	Methylene Chloride	1	<5.0	U	0.71	5.0	10
1634-04-4	Methyl-tert-Butyl Ether	1	<1.0	U	0.60	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	<1.0	U	0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene	1	<1.0	U	0.53	1.0	2.0
75-34-3	1,1-Dichloroethane	1	<1.0	U	0.62	1.0	2.0
78-93-3	2-Butanone	1	<12	R ~~U~~	4.5	12	25 ICL
67-66-3	Chloroform	1	<1.0	U	0.80	1.0	2.0
74-97-5	Bromochloromethane	1	<1.0	U	0.94	1.0	2.0
71-55-6	1,1,1-Trichloroethane	1	<1.0	U	0.80	1.0	2.0
79-20-9	Methyl acetate	1	<1.0	U	0.95	1.0	2.0
110-82-7	Cyclohexane	1	<1.0	U	0.93	1.0	2.0
108-87-2	Methyl cyclohexane	1	<1.0	U	0.64	1.0	2.0
56-23-5	Carbon Tetrachloride	1	<1.0	U	0.94	1.0	2.0
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0
79-01-6	Trichloroethene	1	<1.0	U	0.89	1.0	2.0
78-87-5	1,2-Dichloropropane	1	<1.0	U	0.80	1.0	2.0
75-27-4	Bromodichloromethane	1	<1.0	U	0.52	1.0	2.0
108-10-1	4-Methyl-2-pentanone	1	<2.5	R ~~U~~	0.79	2.5	5.0 ICL
591-78-6	2-Hexanone	1	<2.5	U	1.4	2.5	5.0
10061-01-5	cis-1,3-Dichloropropene	1	<1.0	U	0.59	1.0	2.0
108-88-3	Toluene	1	<1.0	U	0.72	1.0	2.0
10061-02-6	trans-1,3-Dichloropropene	1	<1.0	U	0.73	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U	0.76	1.0	2.0

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ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-EB01-051713-SD

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302870-11	File ID:	3ES006.D
Sampled:	05/17/13 07:00	Prepared:	05/24/13 12:57	Analyzed:	05/24/13 16:14
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 3E24030 Sequence: AA24312 Calibration: 1304028 Instrument: QVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
124-48-1	Dibromochloromethane	1	<1.0	U	0.44	1.0	2.0
106-93-4	1,2-Dibromoethane	1	<1.0	U	0.78	1.0	2.0
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
108-38-3/106-42-3	m,p-Xylenes	1	<2.0	U	1.3	2.0	4.0
95-47-6	o-Xylene	1	<1.0	U	0.53	1.0	2.0
75-25-2	Bromoform	1	<1.0	U	0.75	1.0	2.0
100-42-5	Styrene	1	<1.0	U	0.61	1.0	2.0
98-82-8	Isopropylbenzene	1	<1.0	U	0.67	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
120-82-1	1,2,4-Trichlorobenzene	1	<1.0	U	0.70	1.0	2.0
541-73-1	1,3-Dichlorobenzene	1	<1.0	U	0.77	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0
95-50-1	1,2-Dichlorobenzene	1	<1.0	U	0.73	1.0	2.0
96-12-8	1,2-Dibromo-3-chloropropane	1	<5.0	U	0.96	5.0	10
87-61-6	1,2,3-Trichlorobenzene	1	<1.0	U	0.86	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	107	85 - 115	
1,2-Dichloroethane-d4	50.0	65	129	70 - 120	*
Toluene-d8	50.0	55	109	85 - 120	
4-Bromofluorobenzene	50.0	52	104	75 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1385410	11.47	1457190	11.48	
1,4-Difluorobenzene	2071230	12.05	2274265	12.06	
Chlorobenzene-d5	1913939	14.75	2013436	14.76	
1,4-Dichlorobenzene-d4	889443	17.13	916476	17.15	

* Values outside of QC limits

6/04/13

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-TB01-051713-SD

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302870-12	File ID:	3ES007.D
Sampled:	05/17/13 11:45	Prepared:	05/24/13 12:57	Analyzed:	05/24/13 16:44
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 3E24030 Sequence: AA24312 Calibration: 1304028 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
75-71-8	Dichlorodifluoromethane	1	<1.0	U	0.74	1.0	2.0
74-87-3	Chloromethane	1	<1.0	U	0.82	1.0	2.0
75-01-4	Vinyl chloride	1	<1.0	U	0.71	1.0	2.0
74-83-9	Bromomethane	1	<1.0	U	0.95	1.0	2.0
75-00-3	Chloroethane	1	<1.0	U	0.98	1.0	2.0
75-69-4	Trichlorofluoromethane	1	<1.0	U	0.94	1.0	2.0
76-13-1	Freon 113	1	<1.0	U	0.73	1.0	2.0
67-64-1	Acetone	1	<12	U	1.8	12	25
75-35-4	1,1-Dichloroethene	1	<1.0	U	0.94	1.0	2.0
75-15-0	Carbon disulfide	1	<5.0	U	2.6	5.0	10
75-09-2	Methylene Chloride	1	<5.0	U	0.71	5.0	10
1634-04-4	Methyl-tert-Butyl Ether	1	<1.0	U	0.60	1.0	2.0
156-60-5	trans-1,2-Dichloroethene	1	<1.0	U	0.73	1.0	2.0
156-59-2	cis-1,2-Dichloroethene	1	<1.0	U	0.53	1.0	2.0
75-34-3	1,1-Dichloroethane	1	<1.0	U	0.62	1.0	2.0
78-93-3	2-Butanone	1	<12	R ~~U~~	4.5	12	25 ICL
67-66-3	Chloroform	1	<1.0	U	0.80	1.0	2.0
74-97-5	Bromochloromethane	1	<1.0	U	0.94	1.0	2.0
71-55-6	1,1,1-Trichloroethane	1	<1.0	U	0.80	1.0	2.0
79-20-9	Methyl acetate	1	<1.0	U	0.95	1.0	2.0
110-82-7	Cyclohexane	1	<1.0	U	0.93	1.0	2.0
108-87-2	Methyl cyclohexane	1	<1.0	U	0.64	1.0	2.0
56-23-5	Carbon Tetrachloride	1	<1.0	U	0.94	1.0	2.0
107-06-2	1,2-Dichloroethane	1	<1.0	U	0.63	1.0	2.0
71-43-2	Benzene	1	<1.0	U	0.71	1.0	2.0
79-01-6	Trichloroethene	1	<1.0	U	0.89	1.0	2.0
78-87-5	1,2-Dichloropropane	1	<1.0	U	0.80	1.0	2.0
75-27-4	Bromodichloromethane	1	<1.0	U	0.52	1.0	2.0
108-10-1	4-Methyl-2-pentanone	1	<2.5	R ~~U~~	0.79	2.5	5.0 ICL
591-78-6	2-Hexanone	1	<2.5	U	1.4	2.5	5.0
10061-01-5	cis-1,3-Dichloropropene	1	<1.0	U	0.59	1.0	2.0
108-88-3	Toluene	1	<1.0	U	0.72	1.0	2.0
10061-02-6	trans-1,3-Dichloropropene	1	<1.0	U	0.73	1.0	2.0
79-00-5	1,1,2-Trichloroethane	1	<1.0	U	0.76	1.0	2.0

07/24/13

ORGANIC ANALYSIS DATA SHEET

EPA 8260B

VENO-TB01-051713-SD

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302870-12	File ID:	3ES007.D
Sampled:	05/17/13 11:45	Prepared:	05/24/13 12:57	Analyzed:	05/24/13 16:44
Solids:		Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

Batch: 3E24030 Sequence: AA24312 Calibration: 1304028 Instrument: OVGCMS3

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
127-18-4	Tetrachloroethene	1	<1.0	U	0.76	1.0	2.0
124-48-1	Dibromochloromethane	1	<1.0	U	0.44	1.0	2.0
106-93-4	1,2-Dibromoethane	1	<1.0	U	0.78	1.0	2.0
108-90-7	Chlorobenzene	1	<1.0	U	0.72	1.0	2.0
100-41-4	Ethylbenzene	1	<1.0	U	0.69	1.0	2.0
108-38-3/106-42-3	m,p-Xylenes	1	<2.0	U	1.3	2.0	4.0
95-47-6	o-Xylene	1	<1.0	U	0.53	1.0	2.0
75-25-2	Bromoform	1	<1.0	U	0.75	1.0	2.0
100-42-5	Styrene	1	<1.0	U	0.61	1.0	2.0
98-82-8	Isopropylbenzene	1	<1.0	U	0.67	1.0	2.0
79-34-5	1,1,2,2-Tetrachloroethane	1	<1.0	U	0.54	1.0	2.0
120-82-1	1,2,4-Trichlorobenzene	1	<1.0	U	0.70	1.0	2.0
541-73-1	1,3-Dichlorobenzene	1	<1.0	U	0.77	1.0	2.0
106-46-7	1,4-Dichlorobenzene	1	<1.0	U	0.76	1.0	2.0
95-50-1	1,2-Dichlorobenzene	1	<1.0	U	0.73	1.0	2.0
96-12-8	1,2-Dibromo-3-chloropropane	1	<5.0	U	0.96	5.0	10
87-61-6	1,2,3-Trichlorobenzene	1	<1.0	U	0.86	1.0	2.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	52	103	85 - 115	
1,2-Dichloroethane-d4	50.0	62	123	70 - 120	*
Toluene-d8	50.0	52	105	85 - 120	
4-Bromofluorobenzene	50.0	52	105	75 - 120	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1348148	11.48	1457190	11.48	
1,4-Difluorobenzene	2034640	12.06	2274265	12.06	
Chlorobenzene-d5	1755205	14.75	2013436	14.76	
1,4-Dichlorobenzene-d4	868035	17.13	916476	17.15	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD04-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-05	File ID:	1f3021.D
Sampled:	05/17/13 08:35	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 18:51
Solids:	23.85	Preparation:	EPA 3550C_MS	Initial/Final:	30.2 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.42	U X	0.42	0.42	1.4
108-95-2	Phenol	1	<0.42	U	0.32	0.42	1.4
111-44-4	Bis(2-chloroethyl)ether	1	<0.42	U	0.39	0.42	1.4
95-57-8	2-Chlorophenol	1	<0.42	U	0.34	0.42	1.4
95-48-7	2-Methylphenol	1	<0.42	U	0.29	0.42	1.4
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.42	U	0.34	0.42	1.4
98-86-2	Acetophenone	1	<0.42	U	0.35	0.42	1.4
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.84	U	0.67	0.84	1.4
621-64-7	N-Nitroso-di-n-propylamine	1	<0.42	U	0.38	0.42	1.4
67-72-1	Hexachloroethane	1	<0.42	U	0.31	0.42	1.4
98-95-3	Nitrobenzene	1	<0.42	U	0.33	0.42	1.4
78-59-1	Isophorone	1	<0.42	U	0.30	0.42	1.4
88-75-5	2-Nitrophenol	1	<0.42	U	0.33	0.42	1.4
105-67-9	2,4-Dimethylphenol	1	<0.42	U	0.31	0.42	1.4
111-91-1	Bis(2-chloroethoxy)methane	1	<0.42	U	0.27	0.42	1.4
120-83-2	2,4-Dichlorophenol	1	<0.42	U	0.30	0.42	1.4
106-47-8	4-Chloroaniline	1	<0.42	U	0.39	0.42	1.4
87-68-3	Hexachlorobutadiene	1	<0.42	U	0.34	0.42	1.4
105-60-2	Caprolactam	1	<0.84	U	0.42	0.84	1.4
59-50-7	4-Chloro-3-methylphenol	1	<0.42	U	0.28	0.42	1.4
77-47-4	Hexachlorocyclopentadiene	1	<0.42	U	0.39	0.42	1.4
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.42	U	0.29	0.42	1.4
88-06-2	2,4,6-Trichlorophenol	1	<0.42	U	0.25	0.42	1.4
95-95-4	2,4,5-Trichlorophenol	1	<0.42	U	0.24	0.42	1.4
92-52-4	1,1'-Biphenyl	1	<0.42	U	0.40	0.42	1.4
88-74-4	2-Nitroaniline	1	<0.42	U	0.28	0.42	1.4
131-11-3	Dimethylphthalate	1	<0.42	U	0.26	0.42	1.4
606-20-2	2,6-Dinitrotoluene	1	<0.42	U	0.29	0.42	1.4
99-09-2	3-Nitroaniline	1	<0.42	U	0.31	0.42	1.4
51-28-5	2,4-Dinitrophenol	1	<1.3	UQ	0.50	1.3	1.4
100-02-7	4-Nitrophenol	1	<0.42	UQ	0.34	0.42	1.4
132-64-9	Dibenzofuran	1	<0.42	U	0.28	0.42	1.4
121-14-2	2,4-Dinitrotoluene	1	<0.42	U	0.30	0.42	1.4

RE

MM 07/09/13

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD04-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-05	File ID:	1f3021.D
Sampled:	05/17/13 08:35	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 18:51
Solids:	23.85	Preparation:	EPA 3550C_MS	Initial/Final:	30.2 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.84	U X	0.31	0.84	1.4
84-66-2	Diethylphthalate	1	<0.42	U	0.31	0.42	1.4
7005-72-3	4-Chlorophenyl-phenylether	1	<0.42	U	0.28	0.42	1.4
100-01-6	4-Nitroaniline	1	<0.42	UQ	0.34	0.42	1.4
534-52-1	2-Methyl-4,6-dinitrophenol	1	<1.3	U	0.55	1.3	1.4
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.84	U	0.59	0.84	1.4
101-55-3	4-Bromophenyl-phenylether	1	<0.42	U	0.31	0.42	1.4
118-74-1	Hexachlorobenzene	1	<0.42	U	0.34	0.42	1.4
1912-24-9	Atrazine	1	<0.42	U	0.31	0.42	1.4
87-86-5	Pentachlorophenol	1	<1.3	U	0.59	1.3	1.4
86-74-8	Carbazole	1	<0.42	U	0.29	0.42	1.4
84-74-2	Di-n-butylphthalate	1	<0.42	U	0.33	0.42	1.4
85-68-7	Butylbenzylphthalate	1	<0.42	UQ	0.39	0.42	1.4
91-94-1	3,3'-Dichlorobenzidine	1	<0.42	U	0.38	0.42	1.4
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.42	U	0.36	0.42	1.4
117-84-0	Di-n-octylphthalate	1	<0.42	U	0.28	0.42	1.4

RE

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	6.94	1.3	19	35 - 105	*
Phenol-d5	6.94	1.5	21	40 - 100	*
Nitrobenzene-d5	6.94	0.84	12	35 - 100	*
2-Fluorobiphenyl	6.94	ND		45 - 105	*
2,4,6-Tribromophenol	6.94	0.55	8	35 - 125	*
Terphenyl-d14	6.94	0.77	11	30 - 125	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	390645	6.876	376297	6.946	
Naphthalene-d8	1491002	8.443	1445935	8.527	
Acenaphthene-d10	779857	10.65	860713	10.734	
Phenanthrene-d10	1227782	12.518	1334701	12.61	
Chrysene-d12	853565	16.096	771095	16.217	
Perylene-d12	595086	19.048	620417	19.175	

* Values outside of QC limits

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029

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD04-000H

Laboratory:	ENCO Orlando			SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)			Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Sediment	Laboratory ID:	A302870-05RE1	File ID:	1fe018.D
Sampled:	05/17/13 08:35	Prepared:	06/07/13 09:45	Analyzed:	06/10/13 19:01
Solids:	23.85	Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL
Batch:	3F06021	Sequence: AA24468	Calibration:	1304084	Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.42	UQ R	0.42	0.42	1.4
108-95-2	Phenol	1	<0.42	UQ UJ	0.32	0.42	1.4
111-44-4	Bis(2-chloroethyl)ether	1	<0.42	UQ R	0.39	0.42	1.4
95-57-8	2-Chlorophenol	1	<0.42	UQ UJ	0.34	0.42	1.4
95-48-7	2-Methylphenol	1	<0.42	UQ UJ	0.29	0.42	1.4
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.42	UQ R	0.34	0.42	1.4
98-86-2	Acetophenone	1	<0.42	UQ R	0.35	0.42	1.4
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.84	UQ UJ	0.67	0.84	1.4
621-64-7	N-Nitroso-di-n-propylamine	1	<0.42	UQ R	0.38	0.42	1.4
67-72-1	Hexachloroethane	1	<0.42	UQ	0.31	0.42	1.4
98-95-3	Nitrobenzene	1	<0.42	UQ	0.33	0.42	1.4
78-59-1	Isophorone	1	<0.42	UQ	0.30	0.42	1.4
88-75-5	2-Nitrophenol	1	<0.42	UQ UJ	0.33	0.42	1.4
105-67-9	2,4-Dimethylphenol	1	<0.42	UQ UJ	0.31	0.42	1.4
111-91-1	Bis(2-chloroethoxy)methane	1	<0.42	UQ R	0.27	0.42	1.4
120-83-2	2,4-Dichlorophenol	1	<0.42	UQ UJ	0.30	0.42	1.4
106-47-8	4-Chloroaniline	1	<0.42	UQ R	0.39	0.42	1.4
87-68-3	Hexachlorobutadiene	1	<0.42	UQ	0.34	0.42	1.4
105-60-2	Caprolactam	1	<0.84	UQ	0.42	0.84	1.4
59-50-7	4-Chloro-3-methylphenol	1	<0.42	UQ UJ	0.28	0.42	1.4
77-47-4	Hexachlorocyclopentadiene	1	<0.42	UQ R	0.39	0.42	1.4
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.42	UQ R	0.29	0.42	1.4
88-06-2	2,4,6-Trichlorophenol	1	<0.42	UQ UJ	0.25	0.42	1.4
95-95-4	2,4,5-Trichlorophenol	1	<0.42	UQ UJ	0.24	0.42	1.4
92-52-4	1,1'-Biphenyl	1	<0.42	UQ R	0.40	0.42	1.4
88-74-4	2-Nitroaniline	1	<0.42	UQ	0.28	0.42	1.4
131-11-3	Dimethylphthalate	1	<0.42	UQ	0.26	0.42	1.4
606-20-2	2,6-Dinitrotoluene	1	<0.42	UQ	0.29	0.42	1.4
99-09-2	3-Nitroaniline	1	<0.42	UQ	0.31	0.42	1.4
51-28-5	2,4-Dinitrophenol	1	<1.3	UQ UJ	0.50	1.3	1.4
100-02-7	4-Nitrophenol	1	<0.42	UQ UJ	0.34	0.42	1.4
132-64-9	Dibenzofuran	1	<0.42	UQ R	0.28	0.42	1.4
121-14-2	2,4-Dinitrotoluene	1	<0.42	UQ R	0.30	0.42	1.4

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030

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD04-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-05RE1	File ID:	1fe018.D
Sampled:	05/17/13 08:35	Prepared:	06/07/13 09:45	Analyzed:	06/10/13 19:01
Solids:	23.85	Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

Batch: 3F06021 Sequence: AA24468 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.84	UQ	0.31	0.84	1.4
84-66-2	Diethylphthalate	1	<0.42	UQ	0.31	0.42	1.4
7005-72-3	4-Chlorophenyl-phenylether	1	<0.42	UQ	0.28	0.42	1.4
100-01-6	4-Nitroaniline	1	<0.42	UQ	0.34	0.42	1.4
534-52-1	2-Methyl-4,6-dinitrophenol	1	<1.3	UQ	0.55	1.3	1.4
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.84	UQ	0.59	0.84	1.4
101-55-3	4-Bromophenyl-phenylether	1	<0.42	UQ	0.31	0.42	1.4
118-74-1	Hexachlorobenzene	1	<0.42	UQ	0.34	0.42	1.4
1912-24-9	Atrazine	1	<0.42	UQ	0.31	0.42	1.4
87-86-5	Pentachlorophenol	1	<1.3	UQ	0.59	1.3	1.4
86-74-8	Carbazole	1	<0.42	UQ	0.29	0.42	1.4
84-74-2	Di-n-butylphthalate	1	<0.42	UQ	0.33	0.42	1.4
85-68-7	Butylbenzylphthalate	1	<0.42	UQ	0.39	0.42	1.4
91-94-1	3,3'-Dichlorobenzidine	1	<0.42	UQ	0.38	0.42	1.4
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.42	UQ	0.36	0.42	1.4
117-84-0	Di-n-octylphthalate	1	<0.42	UQ	0.28	0.42	1.4

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	6.99	2.2	31	35 - 105	*
Phenol-d5	6.99	2.6	37	40 - 100	*
Nitrobenzene-d5	6.99	1.6	23	35 - 100	*
2-Fluorobiphenyl	6.99	0.28	4	45 - 105	*
2,4,6-Tribromophenol	6.99	1.1	16	35 - 125	*
Terphenyl-d14	6.99	0.49	7	30 - 125	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	255077	6.786	376297	6.946	
Naphthalene-d8	995170	8.35	1445935	8.527	
Acenaphthene-d10	557969	10.557	860713	10.734	
Phenanthrene-d10	917904	12.425	1334701	12.61	
Chrysene-d12	625064	15.964	771095	16.217	
Perylene-d12	452441	18.896	620417	19.175	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD04-0H01

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-06	File ID:	1f3022.D
Sampled:	05/17/13 08:20	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 19:20
Solids:	31.55	Preparation:	EPA 3550C_MS	Initial/Final:	30.3 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.32	U R	0.31	0.32	1.0
108-95-2	Phenol	1	<0.32	U	0.24	0.32	1.0
111-44-4	Bis(2-chloroethyl)ether	1	<0.32	U	0.29	0.32	1.0
95-57-8	2-Chlorophenol	1	<0.32	U	0.26	0.32	1.0
95-48-7	2-Methylphenol	1	<0.32	U	0.22	0.32	1.0
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.32	U	0.26	0.32	1.0
98-86-2	Acetophenone	1	<0.32	U	0.26	0.32	1.0
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.63	U	0.51	0.63	1.0
621-64-7	N-Nitroso-di-n-propylamine	1	<0.32	U	0.29	0.32	1.0
67-72-1	Hexachloroethane	1	<0.32	U	0.23	0.32	1.0
98-95-3	Nitrobenzene	1	<0.32	U	0.25	0.32	1.0
78-59-1	Isophorone	1	<0.32	U	0.23	0.32	1.0
88-75-5	2-Nitrophenol	1	<0.32	U	0.25	0.32	1.0
105-67-9	2,4-Dimethylphenol	1	<0.32	U	0.23	0.32	1.0
111-91-1	Bis(2-chloroethoxy)methane	1	<0.32	U	0.20	0.32	1.0
120-83-2	2,4-Dichlorophenol	1	<0.32	U	0.23	0.32	1.0
106-47-8	4-Chloroaniline	1	<0.32	U	0.29	0.32	1.0
87-68-3	Hexachlorobutadiene	1	<0.32	U	0.25	0.32	1.0
105-60-2	Caprolactam	1	<0.63	U	0.32	0.63	1.0
59-50-7	4-Chloro-3-methylphenol	1	<0.32	U	0.21	0.32	1.0
77-47-4	Hexachlorocyclopentadiene	1	<0.32	U	0.29	0.32	1.0
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.32	U	0.22	0.32	1.0
88-06-2	2,4,6-Trichlorophenol	1	<0.32	U	0.19	0.32	1.0
95-95-4	2,4,5-Trichlorophenol	1	<0.32	U	0.18	0.32	1.0
92-52-4	1,1'-Biphenyl	1	<0.32	U	0.30	0.32	1.0
88-74-4	2-Nitroaniline	1	<0.32	U	0.21	0.32	1.0
131-11-3	Dimethylphthalate	1	<0.32	U	0.20	0.32	1.0
606-20-2	2,6-Dinitrotoluene	1	<0.32	U	0.22	0.32	1.0
99-09-2	3-Nitroaniline	1	<0.32	U	0.23	0.32	1.0
51-28-5	2,4-Dinitrophenol	1	<0.95	UQ	0.38	0.95	1.0
100-02-7	4-Nitrophenol	1	<0.32	UQ	0.26	0.32	1.0
132-64-9	Dibenzofuran	1	<0.32	U	0.21	0.32	1.0
121-14-2	2,4-Dinitrotoluene	1	<0.32	U	0.23	0.32	1.0

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ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD04-0H01

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-06	File ID:	1f3022.D
Sampled:	05/17/13 08:20	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 19:20
Solids:	31.55	Preparation:	EPA 3550C_MS	Initial/Final:	30.3 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.63	U	0.23	0.63	1.0
84-66-2	Diethylphthalate	1	<0.32	U	0.24	0.32	1.0
7005-72-3	4-Chlorophenyl-phenylether	1	<0.32	U	0.21	0.32	1.0
100-01-6	4-Nitroaniline	1	<0.32	UQ	0.26	0.32	1.0
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.95	U	0.41	0.95	1.0
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.63	U	0.44	0.63	1.0
101-55-3	4-Bromophenyl-phenylether	1	<0.32	U	0.23	0.32	1.0
118-74-1	Hexachlorobenzene	1	<0.32	U	0.26	0.32	1.0
1912-24-9	Atrazine	1	<0.32	U	0.23	0.32	1.0
87-86-5	Pentachlorophenol	1	<0.95	U	0.44	0.95	1.0
86-74-8	Carbazole	1	<0.32	U	0.22	0.32	1.0
84-74-2	Di-n-butylphthalate	1	<0.32	U	0.25	0.32	1.0
85-68-7	Butylbenzylphthalate	1	<0.32	UQ	0.29	0.32	1.0
91-94-1	3,3'-Dichlorobenzidine	1	<0.32	U	0.29	0.32	1.0
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.32	U	0.27	0.32	1.0
117-84-0	Di-n-octylphthalate	1	<0.32	U	0.21	0.32	1.0

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	5.23	1.1	20	35 - 105	*
Phenol-d5	5.23	1.2	24	40 - 100	*
Nitrobenzene-d5	5.23	0.66	13	35 - 100	*
2-Fluorobiphenyl	5.23	ND		45 - 105	*
2,4,6-Tribromophenol	5.23	0.37	7	35 - 125	*
Terphenyl-d14	5.23	0.49	9	30 - 125	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	373669	6.876	376297	6.946	
Naphthalene-d8	1392684	8.443	1445935	8.527	
Acenaphthene-d10	723164	10.65	860713	10.734	
Phenanthrene-d10	1098104	12.517	1334701	12.61	
Chrysene-d12	708666	16.096	771095	16.217	
Perylene-d12	472579	19.048	620417	19.175	

* Values outside of QC limits

UN 07/09/13

033

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD05-000H

Laboratory:	ENCO Orlando			SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)			Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Sediment	Laboratory ID:	A302870-07	File ID:	1f3023.D
Sampled:	05/17/13 09:10	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 19:48
Solids:	27.82	Preparation:	EPA 3550C_MS	Initial/Final:	30.1 g / 1 mL
Batch:	3E22007	Sequence: AA24398	Calibration:	1304084	Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.36	U	0.36	0.36	1.2
108-95-2	Phenol	1	<0.36	U	0.27	0.36	1.2
111-44-4	Bis(2-chloroethyl)ether	1	<0.36	U	0.33	0.36	1.2
95-57-8	2-Chlorophenol	1	<0.36	U	0.29	0.36	1.2
95-48-7	2-Methylphenol	1	<0.36	U	0.25	0.36	1.2
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.36	U	0.29	0.36	1.2
98-86-2	Acetophenone	1	<0.36	U	0.30	0.36	1.2
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.72	U	0.58	0.72	1.2
621-64-7	N-Nitroso-di-n-propylamine	1	<0.36	U	0.32	0.36	1.2
67-72-1	Hexachloroethane	1	<0.36	U	0.27	0.36	1.2
98-95-3	Nitrobenzene	1	<0.36	U	0.28	0.36	1.2
78-59-1	Isophorone	1	<0.36	U	0.26	0.36	1.2
88-75-5	2-Nitrophenol	1	<0.36	U	0.28	0.36	1.2
105-67-9	2,4-Dimethylphenol	1	<0.36	U	0.27	0.36	1.2
111-91-1	Bis(2-chloroethoxy)methane	1	<0.36	U	0.23	0.36	1.2
120-83-2	2,4-Dichlorophenol	1	<0.36	U	0.26	0.36	1.2
106-47-8	4-Chloroaniline	1	<0.36	U	0.33	0.36	1.2
87-68-3	Hexachlorobutadiene	1	<0.36	U	0.29	0.36	1.2
105-60-2	Caprolactam	1	<0.72	U	0.36	0.72	1.2
59-50-7	4-Chloro-3-methylphenol	1	<0.36	U	0.24	0.36	1.2
77-47-4	Hexachlorocyclopentadiene	1	<0.36	U	0.33	0.36	1.2
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.36	U	0.25	0.36	1.2
88-06-2	2,4,6-Trichlorophenol	1	<0.36	U	0.22	0.36	1.2
95-95-4	2,4,5-Trichlorophenol	1	<0.36	U	0.21	0.36	1.2
92-52-4	1,1'-Biphenyl	1	<0.36	U	0.34	0.36	1.2
88-74-4	2-Nitroaniline	1	<0.36	U	0.24	0.36	1.2
131-11-3	Dimethylphthalate	1	<0.36	U	0.22	0.36	1.2
606-20-2	2,6-Dinitrotoluene	1	<0.36	U	0.25	0.36	1.2
99-09-2	3-Nitroaniline	1	<0.36	U	0.27	0.36	1.2
51-28-5	2,4-Dinitrophenol	1	<1.1	UQ	0.43	1.1	1.2
100-02-7	4-Nitrophenol	1	<0.36	UQ	0.29	0.36	1.2
132-64-9	Dibenzofuran	1	<0.36	U	0.24	0.36	1.2
121-14-2	2,4-Dinitrotoluene	1	<0.36	U	0.26	0.36	1.2

034

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD05-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-07	File ID:	1f3023.D
Sampled:	05/17/13 09:10	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 19:48
Solids:	27.82	Preparation:	EPA 3550C MS	Initial/Final:	30.1 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	ONC. (mg/kg dry	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.72	U	0.27	0.72	1.2
84-66-2	Diethylphthalate	1	<0.36	U	0.27	0.36	1.2
7005-72-3	4-Chlorophenyl-phenylether	1	<0.36	U	0.24	0.36	1.2
100-01-6	4-Nitroaniline	1	<0.36	UQ	0.29	0.36	1.2
534-52-1	2-Methyl-4,6-dinitrophenol	1	<1.1	U	0.47	1.1	1.2
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.72	U	0.50	0.72	1.2
101-55-3	4-Bromophenyl-phenylether	1	<0.36	U	0.26	0.36	1.2
118-74-1	Hexachlorobenzene	1	<0.36	U	0.29	0.36	1.2
1912-24-9	Atrazine	1	<0.36	U	0.27	0.36	1.2
87-86-5	Pentachlorophenol	1	<1.1	U	0.50	1.1	1.2
86-74-8	Carbazole	1	<0.36	U	0.24	0.36	1.2
84-74-2	Di-n-butylphthalate	1	<0.36	U	0.28	0.36	1.2
85-68-7	Butylbenzylphthalate	1	<0.36	UQ	0.33	0.36	1.2
91-94-1	3,3'-Dichlorobenzidine	1	<0.36	U	0.33	0.36	1.2
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.36	U	0.31	0.36	1.2
117-84-0	Di-n-octylphthalate	1	<0.36	U	0.24	0.36	1.2

SSL

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	5.97	1.0	17	35 - 105	*
Phenol-d5	5.97	1.2	20	40 - 100	*
Nitrobenzene-d5	5.97	0.55	9	35 - 100	*
2-Fluorobiphenyl	5.97	ND		45 - 105	*
2,4,6-Tribromophenol	5.97	0.24	4	35 - 125	*
Terphenyl-d14	5.97	0.37	6	30 - 125	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	373706	6.876	376297	6.946	
Naphthalene-d8	1392226	8.443	1445935	8.527	
Acenaphthene-d10	727625	10.65	860713	10.734	
Phenanthrene-d10	1104897	12.517	1334701	12.61	
Chrysene-d12	787223	16.096	771095	16.217	
Perylene-d12	510378	19.048	620417	19.175	

* Values outside of QC limits

WM 07/04/13

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD06-000H

Laboratory:	ENCO Orlando			SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)			Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Sediment	Laboratory ID:	A302870-08	File ID:	1f3024.D
Sampled:	05/17/13 09:35	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 20:17
Solids:	36.91	Preparation:	EPA 3550C_MS	Initial/Final:	30.3 g / 1 mL
Batch:	3E22007	Sequence: AA24398	Calibration:	1304084	Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.27	U R	0.27	0.27	0.89
108-95-2	Phenol	1	<0.27	U	0.21	0.27	0.89
111-44-4	Bis(2-chloroethyl)ether	1	<0.27	U	0.25	0.27	0.89
95-57-8	2-Chlorophenol	1	<0.27	U	0.22	0.27	0.89
95-48-7	2-Methylphenol	1	<0.27	U	0.19	0.27	0.89
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.27	U	0.22	0.27	0.89
98-86-2	Acetophenone	1	<0.27	U	0.22	0.27	0.89
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.54	U	0.43	0.54	0.89
621-64-7	N-Nitroso-di-n-propylamine	1	<0.27	U	0.24	0.27	0.89
67-72-1	Hexachloroethane	1	<0.27	U	0.20	0.27	0.89
98-95-3	Nitrobenzene	1	<0.27	U	0.21	0.27	0.89
78-59-1	Isophorone	1	<0.27	U	0.20	0.27	0.89
88-75-5	2-Nitrophenol	1	<0.27	U	0.21	0.27	0.89
105-67-9	2,4-Dimethylphenol	1	<0.27	U	0.20	0.27	0.89
111-91-1	Bis(2-chloroethoxy)methane	1	<0.27	U	0.17	0.27	0.89
120-83-2	2,4-Dichlorophenol	1	<0.27	U	0.19	0.27	0.89
106-47-8	4-Chloroaniline	1	<0.27	U	0.25	0.27	0.89
87-68-3	Hexachlorobutadiene	1	<0.27	U	0.22	0.27	0.89
105-60-2	Caprolactam	1	<0.54	U	0.27	0.54	0.89
59-50-7	4-Chloro-3-methylphenol	1	<0.27	U	0.18	0.27	0.89
77-47-4	Hexachlorocyclopentadiene	1	<0.27	U	0.25	0.27	0.89
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.27	U	0.19	0.27	0.89
88-06-2	2,4,6-Trichlorophenol	1	<0.27	U	0.16	0.27	0.89
95-95-4	2,4,5-Trichlorophenol	1	<0.27	U	0.16	0.27	0.89
92-52-4	1,1'-Biphenyl	1	<0.27	U	0.26	0.27	0.89
88-74-4	2-Nitroaniline	1	<0.27	U	0.18	0.27	0.89
131-11-3	Dimethylphthalate	1	<0.27	U	0.17	0.27	0.89
606-20-2	2,6-Dinitrotoluene	1	<0.27	U	0.19	0.27	0.89
99-09-2	3-Nitroaniline	1	<0.27	U	0.20	0.27	0.89
51-28-5	2,4-Dinitrophenol	1	<0.81	UQ	0.33	0.81	0.89
100-02-7	4-Nitrophenol	1	<0.27	UQ	0.22	0.27	0.89
132-64-9	Dibenzofuran	1	<0.27	U	0.18	0.27	0.89
121-14-2	2,4-Dinitrotoluene	1	<0.27	U	0.20	0.27	0.89

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036

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD06-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-08	File ID:	1f3024.D
Sampled:	05/17/13 09:35	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 20:17
Solids:	36.91	Preparation:	EPA3550C_MS	Initial/Final:	30.3 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.54	U	0.20	0.54	0.89
84-66-2	Diethylphthalate	1	<0.27	U	0.20	0.27	0.89
7005-72-3	4-Chlorophenyl-phenylether	1	<0.27	U	0.18	0.27	0.89
100-01-6	4-Nitroaniline	1	<0.27	UQ	0.22	0.27	0.89
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.81	U	0.35	0.81	0.89
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.54	U	0.38	0.54	0.89
101-55-3	4-Bromophenyl-phenylether	1	<0.27	U	0.20	0.27	0.89
118-74-1	Hexachlorobenzene	1	<0.27	U	0.22	0.27	0.89
1912-24-9	Atrazine	1	<0.27	U	0.20	0.27	0.89
87-86-5	Pentachlorophenol	1	<0.81	U	0.38	0.81	0.89
86-74-8	Carbazole	1	<0.27	U	0.18	0.27	0.89
84-74-2	Di-n-butylphthalate	1	<0.27	U	0.21	0.27	0.89
85-68-7	Butylbenzylphthalate	1	<0.27	UQ	0.25	0.27	0.89
91-94-1	3,3'-Dichlorobenzidine	1	<0.27	U	0.25	0.27	0.89
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.27	U	0.23	0.27	0.89
117-84-0	Di-n-octylphthalate	1	<0.27	U	0.18	0.27	0.89

SSL

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	4.47	0.77	17	35 - 105	*
Phenol-d5	4.47	0.92	20	40 - 100	*
Nitrobenzene-d5	4.47	0.44	10	35 - 100	*
2-Fluorobiphenyl	4.47	ND		45 - 105	*
2,4,6-Tribromophenol	4.47	0.18	4	35 - 125	*
Terphenyl-d14	4.47	0.30	7	30 - 125	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	367592	6.876	376297	6.946	
Naphthalene-d8	1396007	8.443	1445935	8.527	
Acenaphthene-d10	726442	10.65	860713	10.734	
Phenanthrene-d10	1093462	12.518	1334701	12.61	
Chrysene-d12	765613	16.096	771095	16.217	
Perylene-d12	419730	19.048	620417	19.175	

* Values outside of QC limits

WM 07/09/13

037

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD07-000H

Laboratory:	ENCO Orlando			SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)			Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Sediment	Laboratory ID:	A302870-09	File ID:	1f3025.D
Sampled:	05/17/13 10:15	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 20:45
Solids:	75.70	Preparation:	EPA 3550C_MS	Initial/Final:	30.1 g / 1 mL
Batch:	3E22007	Sequence: AA24398	Calibration:	1304084	Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.13	U	0.13	0.13	0.44
108-95-2	Phenol	1	<0.13	U	0.10	0.13	0.44
111-44-4	Bis(2-chloroethyl)ether	1	<0.13	U	0.12	0.13	0.44
95-57-8	2-Chlorophenol	1	<0.13	U	0.11	0.13	0.44
95-48-7	2-Methylphenol	1	<0.13	U	0.092	0.13	0.44
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.13	U	0.11	0.13	0.44
98-86-2	Acetophenone	1	<0.13	U	0.11	0.13	0.44
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.26	U	0.21	0.26	0.44
621-64-7	N-Nitroso-di-n-propylamine	1	<0.13	U	0.12	0.13	0.44
67-72-1	Hexachloroethane	1	<0.13	U	0.098	0.13	0.44
98-95-3	Nitrobenzene	1	<0.13	U	0.10	0.13	0.44
78-59-1	Isophorone	1	<0.13	U	0.095	0.13	0.44
88-75-5	2-Nitrophenol	1	<0.13	U	0.10	0.13	0.44
105-67-9	2,4-Dimethylphenol	1	<0.13	U	0.098	0.13	0.44
111-91-1	Bis(2-chloroethoxy)methane	1	<0.13	U	0.085	0.13	0.44
120-83-2	2,4-Dichlorophenol	1	<0.13	U	0.094	0.13	0.44
106-47-8	4-Chloroaniline	1	<0.13	U	0.12	0.13	0.44
87-68-3	Hexachlorobutadiene	1	<0.13	U	0.11	0.13	0.44
105-60-2	Caprolactam	1	<0.26	U	0.13	0.26	0.44
59-50-7	4-Chloro-3-methylphenol	1	<0.13	U	0.089	0.13	0.44
77-47-4	Hexachlorocyclopentadiene	1	<0.13	U	0.12	0.13	0.44
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.13	U	0.091	0.13	0.44
88-06-2	2,4,6-Trichlorophenol	1	<0.13	U	0.079	0.13	0.44
95-95-4	2,4,5-Trichlorophenol	1	<0.13	U	0.077	0.13	0.44
92-52-4	1,1'-Biphenyl	1	<0.13	U	0.13	0.13	0.44
88-74-4	2-Nitroaniline	1	<0.13	U	0.089	0.13	0.44
131-11-3	Dimethylphthalate	1	<0.13	U	0.082	0.13	0.44
606-20-2	2,6-Dinitrotoluene	1	<0.13	U	0.091	0.13	0.44
99-09-2	3-Nitroaniline	1	<0.13	U	0.098	0.13	0.44
51-28-5	2,4-Dinitrophenol	1	<0.40	~~UQ~~ UJ	0.16	0.40	0.44 ICH
100-02-7	4-Nitrophenol	1	<0.13	~~UQ~~ UJ	0.11	0.13	0.44 CCH
132-64-9	Dibenzofuran	1	<0.13	U	0.087	0.13	0.44
121-14-2	2,4-Dinitrotoluene	1	<0.13	~~U~~ UJ	0.095	0.13	0.44 CCH

LM 07/24/13

038

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD07-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-09	File ID:	1f3025.D
Sampled:	05/17/13 10:15	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 20:45
Solids:	75.70	Preparation:	EPA 3550C_MS	Initial/Final:	30.1 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.26	U	0.098	0.26	0.44
84-66-2	Diethylphthalate	1	<0.13	U	0.099	0.13	0.44
7005-72-3	4-Chlorophenyl-phenylether	1	<0.13	U	0.089	0.13	0.44
100-01-6	4-Nitroaniline	1	<0.13	~~UQ~~ UJ	0.11	0.13	0.44 CCH
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.40	~~U~~ UJ	0.17	0.40	0.44 ICH
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.26	U	0.18	0.26	0.44
101-55-3	4-Bromophenyl-phenylether	1	<0.13	U	0.096	0.13	0.44
118-74-1	Hexachlorobenzene	1	<0.13	U	0.11	0.13	0.44
1912-24-9	Atrazine	1	<0.13	U	0.098	0.13	0.44
87-86-5	Pentachlorophenol	1	<0.40	U	0.18	0.40	0.44
86-74-8	Carbazole	1	<0.13	U	0.090	0.13	0.44
84-74-2	Di-n-butylphthalate	1	<0.13	U	0.10	0.13	0.44
85-68-7	Butylbenzylphthalate	1	<0.13	~~UQ~~ UJ	0.12	0.13	0.44 CCH
91-94-1	3,3'-Dichlorobenzidine	1	<0.13	U	0.12	0.13	0.44
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.13	U	0.11	0.13	0.44
117-84-0	Di-n-octylphthalate	1	<0.13	U	0.089	0.13	0.44

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	2.19	1.6	72	35 - 105	
Phenol-d5	2.19	1.7	76	40 - 100	
Nitrobenzene-d5	2.19	1.5	67	35 - 100	
2-Fluorobiphenyl	2.19	1.0	47	45 - 105	
2,4,6-Tribromophenol	2.19	1.3	61	35 - 125	
Terphenyl-d14	2.19	1.2	54	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	371516	6.876	376297	6.946	
Naphthalene-d8	1409964	8.443	1445935	8.527	
Acenaphthene-d10	743045	10.65	860713	10.734	
Phenanthrene-d10	1148401	12.518	1334701	12.61	
Chrysene-d12	816553	16.096	771095	16.217	
Perylene-d12	546379	19.048	620417	19.175	

* Values outside of QC limits

LM 070913

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD07P-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-10	File ID:	1f3026.D
Sampled:	05/17/13 10:15	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 21:13
Solids:	76.16	Preparation:	EPA 3550C_MS	Initial/Final:	30.4 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<0.13	U	0.13	0.13	0.43
108-95-2	Phenol	1	<0.13	U	0.10	0.13	0.43
111-44-4	Bis(2-chloroethyl)ether	1	<0.13	U	0.12	0.13	0.43
95-57-8	2-Chlorophenol	1	<0.13	U	0.11	0.13	0.43
95-48-7	2-Methylphenol	1	<0.13	U	0.092	0.13	0.43
108-60-1	Bis(2-chloroisopropyl)ether	1	<0.13	U	0.11	0.13	0.43
98-86-2	Acetophenone	1	<0.13	U	0.11	0.13	0.43
108-39-4/106-44-5	3 & 4-Methylphenol	1	<0.26	U	0.21	0.26	0.43
621-64-7	N-Nitroso-di-n-propylamine	1	<0.13	U	0.12	0.13	0.43
67-72-1	Hexachloroethane	1	<0.13	U	0.097	0.13	0.43
98-95-3	Nitrobenzene	1	<0.13	U	0.10	0.13	0.43
78-59-1	Isophorone	1	<0.13	U	0.095	0.13	0.43
88-75-5	2-Nitrophenol	1	<0.13	U	0.10	0.13	0.43
105-67-9	2,4-Dimethylphenol	1	<0.13	U	0.097	0.13	0.43
111-91-1	Bis(2-chloroethoxy)methane	1	<0.13	U	0.084	0.13	0.43
120-83-2	2,4-Dichlorophenol	1	<0.13	U	0.093	0.13	0.43
106-47-8	4-Chloroaniline	1	<0.13	U	0.12	0.13	0.43
87-68-3	Hexachlorobutadiene	1	<0.13	U	0.11	0.13	0.43
105-60-2	Caprolactam	1	<0.26	U	0.13	0.26	0.43
59-50-7	4-Chloro-3-methylphenol	1	<0.13	U	0.088	0.13	0.43
77-47-4	Hexachlorocyclopentadiene	1	<0.13	U	0.12	0.13	0.43
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<0.13	U	0.091	0.13	0.43
88-06-2	2,4,6-Trichlorophenol	1	<0.13	U	0.079	0.13	0.43
95-95-4	2,4,5-Trichlorophenol	1	<0.13	U	0.076	0.13	0.43
92-52-4	1,1'-Biphenyl	1	<0.13	U	0.12	0.13	0.43
88-74-4	2-Nitroaniline	1	<0.13	U	0.088	0.13	0.43
131-11-3	Dimethylphthalate	1	<0.13	U	0.081	0.13	0.43
606-20-2	2,6-Dinitrotoluene	1	<0.13	U	0.091	0.13	0.43
99-09-2	3-Nitroaniline	1	<0.13	U	0.097	0.13	0.43
51-28-5	2,4-Dinitrophenol	1	<0.39	~~UJ~~ UJ	0.16	0.39	0.43 ICH
100-02-7	4-Nitrophenol	1	<0.13	~~UJ~~ UJ	0.11	0.13	0.43 CCH
132-64-9	Dibenzofuran	1	<0.13	U	0.087	0.13	0.43
121-14-2	2,4-Dinitrotoluene	1	<0.13	~~U~~ UJ	0.095	0.13	0.43 CCH

VM 07/09/13

040

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-SD07P-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-10	File ID:	1f3026.D
Sampled:	05/17/13 10:15	Prepared:	05/22/13 09:00	Analyzed:	06/03/13 21:13
Solids:	76.16	Preparation:	EPA 3550C_MS	Initial/Final:	30.4 g / 1 mL

Batch: 3E22007 Sequence: AA24398 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<0.26	U	0.097	0.26	0.43
84-66-2	Diethylphthalate	1	<0.13	U	0.098	0.13	0.43
7005-72-3	4-Chlorophenyl-phenylether	1	<0.13	U	0.088	0.13	0.43
100-01-6	4-Nitroaniline	1	<0.13	~~UQ~~ UJ	0.11	0.13	0.43 CCH
534-52-1	2-Methyl-4,6-dinitrophenol	1	<0.39	~~U~~ UJ	0.17	0.39	0.43 ICH
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<0.26	U	0.18	0.26	0.43
101-55-3	4-Bromophenyl-phenylether	1	<0.13	U	0.096	0.13	0.43
118-74-1	Hexachlorobenzene	1	<0.13	U	0.11	0.13	0.43
1912-24-9	Atrazine	1	<0.13	U	0.097	0.13	0.43
87-86-5	Pentachlorophenol	1	<0.39	U	0.18	0.39	0.43
86-74-8	Carbazole	1	<0.13	U	0.089	0.13	0.43
84-74-2	Di-n-butylphthalate	1	<0.13	U	0.10	0.13	0.43
85-68-7	Butylbenzylphthalate	1	<0.13	~~UQ~~ UJ	0.12	0.13	0.43 CCH
91-94-1	3,3'-Dichlorobenzidine	1	<0.13	U	0.12	0.13	0.43
117-81-7	Bis(2-ethylhexyl)phthalate	1	<0.13	U	0.11	0.13	0.43
117-84-0	Di-n-octylphthalate	1	<0.13	U	0.088	0.13	0.43

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2-Fluorophenol	2.16	1.8	84	35 - 105	
Phenol-d5	2.16	1.9	89	40 - 100	
Nitrobenzene-d5	2.16	1.6	76	35 - 100	
2-Fluorobiphenyl	2.16	0.85	39	45 - 105	*
2,4,6-Tribromophenol	2.16	1.5	70	35 - 125	
Terphenyl-d14	2.16	1.6	72	30 - 125	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	391625	6.876	376297	6.946	
Naphthalene-d8	1499268	8.443	1445935	8.527	
Acenaphthene-d10	786661	10.65	860713	10.734	
Phenanthrene-d10	1201183	12.517	1334701	12.61	
Chrysene-d12	860445	16.096	771095	16.217	
Perylene-d12	519285	19.048	620417	19.175	

* Values outside of QC limits

WM 070913

041

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-EB01-051713-SD

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302870-11	File ID:	1f5010.D
Sampled:	05/17/13 07:00	Prepared:	05/22/13 01:30	Analyzed:	06/05/13 15:03
Solids:		Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

Batch: 3E22001 Sequence: AA24423 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
100-52-7	Benzaldehyde	1	<6.0	~~UQ~~	5.4	6.0	10
108-95-2	Phenol	1	<3.0	U	1.4	3.0	10
111-44-4	Bis(2-chloroethyl)ether	1	<6.0	U	3.2	6.0	10
95-57-8	2-Chlorophenol	1	<6.0	U	2.8	6.0	10
95-48-7	2-Methylphenol	1	<3.0	U	2.3	3.0	10
108-60-1	Bis(2-chloroisopropyl)ether	1	<6.0	U	3.1	6.0	10
98-86-2	Acetophenone	1	<3.0	U	3.0	3.0	10
108-39-4/106-44-5	3 & 4-Methylphenol	1	<6.0	U	4.5	6.0	10
621-64-7	N-Nitroso-di-n-propylamine	1	<6.0	U	3.4	6.0	10
67-72-1	Hexachloroethane	1	<3.0	U	2.9	3.0	10
98-95-3	Nitrobenzene	1	<6.0	U	3.1	6.0	10
78-59-1	Isophorone	1	<3.0	U	2.9	3.0	10
88-75-5	2-Nitrophenol	1	<6.0	U	3.1	6.0	10
105-67-9	2,4-Dimethylphenol	1	<6.0	U	2.7	6.0	10
111-91-1	Bis(2-chloroethoxy)methane	1	<6.0	U	2.7	6.0	10
120-83-2	2,4-Dichlorophenol	1	<6.0	U	3.3	6.0	10
106-47-8	4-Chloroaniline	1	<6.0	U	2.7	6.0	10
87-68-3	Hexachlorobutadiene	1	<6.0	U	3.6	6.0	10
105-60-2	Caprolactam	1	<3.0	U	2.7	3.0	10
59-50-7	4-Chloro-3-methylphenol	1	<6.0	U	2.6	6.0	10
77-47-4	Hexachlorocyclopentadiene	1	<6.0	U	3.8	6.0	10
95-94-3	1,2,4,5-Tetrachlorobenzene	1	<6.0	U	3.2	6.0	10
88-06-2	2,4,6-Trichlorophenol	1	<6.0	U	3.7	6.0	10
95-95-4	2,4,5-Trichlorophenol	1	<6.0	U	3.6	6.0	10
92-52-4	1,1'-Biphenyl	1	<9.0	U	7.0	9.0	10
88-74-4	2-Nitroaniline	1	<3.0	U	2.8	3.0	10
131-11-3	Dimethylphthalate	1	<3.0	U	2.9	3.0	10
606-20-2	2,6-Dinitrotoluene	1	<3.0	U	2.7	3.0	10
99-09-2	3-Nitroaniline	1	<3.0	U	2.8	3.0	10
51-28-5	2,4-Dinitrophenol	1	<6.0	~~U~~ UJ	5.2	6.0	10 ICH
100-02-7	4-Nitrophenol	1	<3.0	UQ	2.3	3.0	10
132-64-9	Dibenzofuran	1	<3.0	U	2.8	3.0	10
121-14-2	2,4-Dinitrotoluene	1	<6.0	U	2.8	6.0	10

LW 070913

042

ORGANIC ANALYSIS DATA SHEET

EPA 8270D

VENO-EB01-051713-SD

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302870-11	File ID:	1f5010.D
Sampled:	05/17/13 07:00	Prepared:	05/22/13 01:30	Analyzed:	06/05/13 15:03
Solids:		Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

Batch: 3E22001 Sequence: AA24423 Calibration: 1304084 Instrument: OSVGCMS1

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
58-90-2	2,3,4,6-Tetrachlorophenol	1	<6.0	U~~Q~~	4.7	6.0	10
84-66-2	Diethylphthalate	1	<3.0	U	3.0	3.0	10
7005-72-3	4-Chlorophenyl-phenylether	1	<6.0	U	3.2	6.0	10
100-01-6	4-Nitroaniline	1	<3.0	~~U~~ UJ	2.7	3.0	10 CCH
534-52-1	2-Methyl-4,6-dinitrophenol	1	<6.0	~~U~~ UJ	6.0	6.0	10 ICH
86-30-6/122-39-4	N-nitrosodiphenylamine/Diphenylamine	1	<6.0	U	5.4	6.0	10
101-55-3	4-Bromophenyl-phenylether	1	<6.0	U	3.3	6.0	10
118-74-1	Hexachlorobenzene	1	<3.0	U	3.0	3.0	10
1912-24-9	Atrazine	1	<3.0	U~~Q~~	2.9	3.0	10
87-86-5	Pentachlorophenol	1	<9.0	U	6.3	9.0	10
86-74-8	Carbazole	1	<3.0	U	2.5	3.0	10
84-74-2	Di-n-butylphthalate	1	<3.0	U	2.7	3.0	10
85-68-7	Butylbenzylphthalate	1	<3.0	U	2.8	3.0	10
91-94-1	3,3'-Dichlorobenzidine	1	<6.0	U	3.2	6.0	10
117-81-7	Bis(2-ethylhexyl)phthalate	1	<6.0	U	3.5	6.0	10
117-84-0	Di-n-octylphthalate	1	<6.0	U	3.4	6.0	10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorophenol	50.0	30	60	20 - 110	
Phenol-d5	50.0	21	43	10 - 115	
Nitrobenzene-d5	50.0	46	92	40 - 110	
2-Fluorobiphenyl	50.0	43	86	50 - 110	
2,4,6-Tribromophenol	50.0	50	99	40 - 125	
Terphenyl-d14	50.0	66	131	50 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
1,4-Dichlorobenzene-d4	314953	6.846	376297	6.946	
Naphthalene-d8	1173328	8.415	1445935	8.527	
Acenaphthene-d10	638684	10.622	860713	10.734	
Phenanthrene-d10	1061843	12.483	1334701	12.61	
Chrysene-d12	808534	16.041	771095	16.217	
Perylene-d12	567840	18.989	620417	19.175	

* Values outside of QC limits

UM 07/09/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-SS03-0001

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Soil	Laboratory ID:	A302870-01	File ID:	2F4040.D
Sampled:	05/16/13 14:20	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 17:59
Solids:	71.55	Preparation:	EPA 3550C	Initial/Final:	30 g / 10 mL

Batch:	3E21001	Sequence:	AA24376	Calibration:	1304047	Instrument:	OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	<0.0014	U	0.00073	0.0014	0.0024
72-54-8	4,4'-DDD	1	<0.0014	U	0.00067	0.0014	0.0024
50-29-3	4,4'-DDT	1	<0.0014	UJ / CL4	0.00092	0.0014	0.0024

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0466	0.037	80	70 - 125	
2,4,5,6-TCMX [2C]	0.0466	0.033	70	70 - 125	
Decachlorobiphenyl	0.0466	0.037	80	55 - 130	
Decachlorobiphenyl [2C]	0.0466	0.032	69	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	274100000	5.482	3.764E+08	5.31	
DBC [2C]	181900000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JMC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-SS02-0001

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Soil	Laboratory ID:	A302870-02	File ID:	2F4018.D
Sampled:	05/16/13 14:35	Prepared:	05/21/13 14:30	Analyzed:	06/04/13 13:33
Solids:	72.26	Preparation:	EPA 3550C	Initial/Final:	30.2 g / 10 mL

Batch: 3E21021 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	<0.0014	~~UJ~~ ~~UQ~~ 4SL	0.00072	0.0014	0.0024
72-54-8	4,4'-DDD	1	<0.0014	~~U~~	0.00066	0.0014	0.0024
50-29-3	4,4'-DDT	1	<0.0014	~~UQ~~	0.00091	0.0014	0.0024

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0458	0.019	41	70 - 125	
2,4,5,6-TCMX [2C]	0.0458	0.018	40	70 - 125	
Decachlorobiphenyl	0.0458	0.022	48	55 - 130	
Decachlorobiphenyl [2C]	0.0458	0.019	42	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	536800000	5.482	3.764E+08	5.31	
DBC [2C]	355300000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-SS02-0001

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Soil	Laboratory ID:	A302870-02RE1	File ID:	2FB018.D
Sampled:	05/16/13 14:35	Prepared:	06/05/13 10:30	Analyzed:	06/07/13 13:35
Solids:	72.26	Preparation:	EPA 3550C	Initial/Final:	30 g / 10 mL

Batch: 3F05007 Sequence: AA24452 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	<0.0028	~~UDQ~~ RE	0.0014	0.0028	0.0047
72-54-8	4,4'-DDD	2	<0.0028	UDQ	0.0013	0.0028	0.0047
50-29-3	4,4'-DDT	2	<0.0028	UDQ	0.0018	0.0028	0.0047

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0461	0.016	35	70 - 125	*
2,4,5,6-TCMX [2C]	0.0461	0.019	40	70 - 125	*
Decachlorobiphenyl	0.0461	0.035	76	55 - 130	
Decachlorobiphenyl [2C]	0.0461	0.036	78	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	540200000	5.458	3.764E+08	5.31	
DBC [2C]	292200000	5.359	2.1E+08	5.22	

* Values outside of QC limits

JAC
7/23

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-SS06-0001

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Soil	Laboratory ID:	A302870-03	File ID:	2F4041.D
Sampled:	05/16/13 15:10	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 18:11
Solids:	50.10	Preparation:	EPA 3550C	Initial/Final:	30.4 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	<0.0020	W U SSL	0.0010	0.0020	0.0034
72-54-8	4,4'-DDD	1	<0.0020	U	0.00096	0.0020	0.0034
50-29-3	4,4'-DDT	1	<0.0020	U	0.0013	0.0020	0.0034

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0657	0.044	67	70 - 125	
2,4,5,6-TCMX [2C]	0.0657	0.040	61	70 - 125	
Decachlorobiphenyl	0.0657	0.048	73	55 - 130	
Decachlorobiphenyl [2C]	0.0657	0.041	62	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	268900000	5.483	3.764E+08	5.31	
DBC [2C]	175600000	5.389	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-EB02-051613-SS

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302870-04	File ID:	2F4022.D
Sampled:	05/16/13 06:45	Prepared:	05/20/13 13:30	Analyzed:	06/04/13 14:21
Solids:		Preparation:	EPA 3510C	Initial/Final:	500 mL / 5 mL

Batch: 3E20028 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	<0.050	U	0.023	0.050	0.10
72-54-8	4,4'-DDD	1	<0.050	U	0.023	0.050	0.10
50-29-3	4,4'-DDT	1	<0.050	U	0.024	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.80	80	25 - 140	
2,4,5,6-TCMX [2C]	1.00	0.72	72	25 - 140	
Decachlorobiphenyl	1.00	0.79	79	30 - 135	
Decachlorobiphenyl [2C]	1.00	0.69	69	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	542500000	5.482	3.764E+08	5.31	
DBC [2C]	347000000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC
7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-SD04-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-05	File ID:	2F4042.D
Sampled:	05/17/13 08:35	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 18:23
Solids:	23.85	Preparation:	EPA 3550C	Initial/Final:	30.3 g / 10 mL

Batch: 3E21001 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	0.020	J ~~DPQ~~ SSL	0.0044	0.0084	0.014
72-54-8	4,4'-DDD	2	0.0083	J ~~JDQ~~	0.0040	0.0084	0.014
50-29-3	4,4'-DDT	2	<0.0084	UJ ~~UD~~	0.0055	0.0084	0.014

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.138	0.086	62	70 - 125	
2,4,5,6-TCMX [2C]	0.138	0.082	59	70 - 125	
Decachlorobiphenyl	0.138	0.095	69	55 - 130	
Decachlorobiphenyl [2C]	0.138	0.084	60	55 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	539400000	5.482	3.764E+08	5.31	
DBC [2C]	348900000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JC
7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-SD04-0H01

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-06	File ID:	2F4043.D
Sampled:	05/17/13 08:20	Prepared:	05/21/13 14:30	Analyzed:	06/04/13 18:35
Solids:	31.55	Preparation:	EPA 3550C	Initial/Final:	30.2 g / 10 mL

Batch: 3E21021 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	<0.0063	UJ UD SX	0.0033	0.0063	0.011
72-54-8	4,4'-DDD	2	<0.0063	UD	0.0030	0.0063	0.011
50-29-3	4,4'-DDT	2	<0.0063	UD	0.0042	0.0063	0.011

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.105	0.029	27	70 - 125	*
2,4,5,6-TCMX [2C]	0.105	0.026	25	70 - 125	*
Decachlorobiphenyl	0.105	0.036	34	55 - 130	*
Decachlorobiphenyl [2C]	0.105	0.026	25	55 - 130	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	471800000	5.482	3.764E+08	5.31	
DBC [2C]	309500000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC 7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-SD05-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-07	File ID:	2F4044.D
Sampled:	05/17/13 09:10	Prepared:	05/21/13 14:30	Analyzed:	06/04/13 18:47
Solids:	27.82	Preparation:	EPA 3550C	Initial/Final:	30 g / 10 mL

Batch:	3E21021	Sequence:	AA24376	Calibration:	1304047	Instrument:	OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	<0.0072	~~UD~~ SSL	0.0037	0.0072	0.012
72-54-8	4,4'-DDD	2	0.0072	J ~~ID~~	0.0035	0.0072	0.012
50-29-3	4,4'-DDT	2	<0.0072	~~UD~~	0.0047	0.0072	0.012

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.120	0.020	17	70 - 125	*
2,4,5,6-TCMX [2C]	0.120	0.025	21	70 - 125	*
Decachlorobiphenyl	0.120	0.031	26	55 - 130	*
Decachlorobiphenyl [2C]	0.120	0.026	21	55 - 130	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	603400000	5.482	3.764E+08	5.31	
DBC [2C]	388000000	5.388	2.1E+08	5.22	

* Values outside of QC limits

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7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-SD06-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-08	File ID:	2F4045.D
Sampled:	05/17/13 09:35	Prepared:	05/21/13 14:30	Analyzed:	06/04/13 18:59
Solids:	36.91	Preparation:	EPA 3550C	Initial/Final:	30 g / 10 mL

Batch: 3E21021 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	0.014	J ~~P~~ SSC	0.0028	0.0054	0.0092
72-54-8	4,4'-DDD	2	0.15	J ~~P~~	0.0026	0.0054	0.0092
50-29-3	4,4'-DDT	2	<0.0054	UJ ~~UD~~	0.0036	0.0054	0.0092

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0903	0.032	35	70 - 125	*
2,4,5,6-TCMX [2C]	0.0903	0.032	35	70 - 125	*
Decachlorobiphenyl	0.0903	0.038	43	55 - 130	*
Decachlorobiphenyl [2C]	0.0903	0.035	38	55 - 130	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	536300000	5.482	3.764E+08	5.31	
DBC [2C]	343500000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC
7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-SD07-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill. Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-09	File ID:	2F4046.D
Sampled:	05/17/13 10:15	Prepared:	05/21/13 14:30	Analyzed:	06/04/13 19:11
Solids:	75.70	Preparation:	EPA 3550C	Initial/Final:	30.2 g / 10 mL

Batch: 3E21021 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	<0.0026	UJ ~~UD~~ SL	0.0014	0.0026	0.0045
72-54-8	4,4'-DDD	2	0.0026	J ~~JD~~	0.0013	0.0026	0.0045
50-29-3	4,4'-DDT	2	<0.0026	UJ ~~UD~~	0.0017	0.0026	0.0045

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0437	0.0098	22	70 - 125	*
2,4,5,6-TCMX [2C]	0.0437	0.0089	20	70 - 125	*
Decachlorobiphenyl	0.0437	0.015	34	55 - 130	*
Decachlorobiphenyl [2C]	0.0437	0.014	33	55 - 130	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	552200000	5.482	3.764E+08	5.31	
DBC [2C]	360500000	5.388	2.1E+08	5.22	

* Values outside of QC limits

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7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-SD07-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-09RE1	File ID:	2FB023.D
Sampled:	05/17/13 10:15	Prepared:	06/06/13 12:45	Analyzed:	06/07/13 15:00
Solids:	75.70	Preparation:	EPA 3550C	Initial/Final:	30 g / 10 mL

Batch: 3F06020 Sequence: AA24452 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	<0.0026	exclude UDQ RE	0.0014	0.0026	0.0045
72-54-8	4,4'-DDD	2	0.0026	JDQ	0.0013	0.0026	0.0045
50-29-3	4,4'-DDT	2	<0.0026	UDQ	0.0017	0.0026	0.0045

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0440	0.0066	15	70 - 125	*
2,4,5,6-TCMX [2C]	0.0440	0.0063	14	70 - 125	*
Decachlorobiphenyl	0.0440	0.0063	14	55 - 130	*
Decachlorobiphenyl [2C]	0.0440	0.0056	13	55 - 130	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	623800000	5.458	3.764E+08	5.31	
DBC [2C]	376000000	5.359	2.1E+08	5.22	

* Values outside of QC limits

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7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-SD07P-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-10	File ID:	2F4047.D
Sampled:	05/17/13 10:15	Prepared:	05/21/13 14:30	Analyzed:	06/04/13 19:23
Solids:	76.16	Preparation:	EPA 3550C	Initial/Final:	30 g / 10 mL

Batch: 3E21021 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	2	<0.0026	UJ ~~UDC~~ SL	0.0014	0.0026	0.0045
72-54-8	4,4'-DDD	2	0.0025	J ~~JDQ~~	0.0013	0.0026	0.0045
50-29-3	4,4'-DDT	2	<0.0026	UJ ~~UD~~	0.0017	0.0026	0.0045

SYSTEM MONITORING COMPOUND	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	0.0438	0.013	29	70 - 125	*
2,4,5,6-TCMX [2C]	0.0438	0.012	27	70 - 125	*
Decachlorobiphenyl	0.0438	0.017	39	55 - 130	*
Decachlorobiphenyl [2C]	0.0438	0.015	35	55 - 130	*

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	538100000	5.482	3.764E+08	5.31	
DBC [2C]	350900000	5.388	2.1E+08	5.22	

* Values outside of QC limits

JAC
7/2/13

ORGANIC ANALYSIS DATA SHEET

EPA 8081B

VENO-EB01-051713-SD

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Water	Laboratory ID:	A302870-11	File ID:	2F4023.D
Sampled:	05/17/13 07:00	Prepared:	05/20/13 13:30	Analyzed:	06/04/13 14:33
Solids:		Preparation:	EPA 3510C	Initial/Final:	500 mL / 5 mL

Batch: 3E20028 Sequence: AA24376 Calibration: 1304047 Instrument: OSVGCECD2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	LOD	LOQ
72-55-9	4,4'-DDE	1	<0.050	U	0.023	0.050	0.10
72-54-8	4,4'-DDD	1	<0.050	U	0.023	0.050	0.10
50-29-3	4,4'-DDT	1	<0.050	U	0.024	0.050	0.10

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2,4,5,6-TCMX	1.00	0.85	85	25 - 140	
2,4,5,6-TCMX [2C]	1.00	0.78	78	25 - 140	
Decachlorobiphenyl	1.00	0.83	83	30 - 135	
Decachlorobiphenyl [2C]	1.00	0.73	73	30 - 135	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
DBC	517200000	5.482	3.764E+08	5.31	
DBC [2C]	331600000	5.388	2.1E+08	5.22	

* Values outside of QC limits

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7/2/13

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PROJECT NARRATIVE

Client: CH2M Hill, Inc.
Project: East Vieques La Chiva SWMU 1, CTO-0037
Project Number: 408040
ENCO Project ID: A302870
SDG: A302870-CTO0037

Overview

All samples submitted were analyzed by Environmental Conservation Laboratories, Inc. in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling and processing will be discussed in the Remarks section below.

Remarks

Analytical and Preparation Method/ SOP Reference	Instrument
EPA 8260B	OVGCMS2/ OVGCMS3
EPA 8270D	OSVGCMS1
EPA 8081B	OSVGCECD2
EPA 9045D	OWETSPH1
Walkley Black	Titration

Analysis: EPA 8260B
Sequence: AA22766
Affected Sample(s): AA22766-ICB1, AA22766-CAL1, AA22766-CAL2, AA22766-CAL3, AA22766-CAL4, AA22766-CAL5, AA22766-CAL6, AA22766-SCV1, AA22766-SCV2
Nonconformance: Manual integrations
Additional Information: The following manual integrations were performed in the sample(s) AA22766-ICB1, AA22766-CAL6 due to ISTD reintegration: 1,4- Difluorobenzene.
The following manual integrations were performed in the sample(s) AA22766-CAL1 due to ISTD reintegration: Pentafluorobenzene, 1,4- Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) AA22766-CAL1 due to poor integration (peak tailing, baseline selection): Methyl Cyclohexane, Carbon Tetrachloride, Benzene, 1,2-Dichloropropane, 1,4-Dioxane, 2-Chloroethyl vinyl ether, 1,1,2,2-Tetrachloroethane.
The following manual integrations were performed in the sample(s) AA22766-CAL1 due to incorrect peak selection/peak not found: 1,4-Dioxane.
The following manual integrations were performed in the sample(s) AA22766-CAL2 due to poor integration (peak tailing, baseline selection): Chloroethane, Acetone, Carbon Tetrachloride, 2-Chloroethyl vinyl ether, CHlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA22766-CAL2 due to ISTD reintegration: Chlorobenzene-d5, 1,4- Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) AA22766-CAL3 due to poor integration (peak tailing, baseline selection): Bromomethane, 1,2-Dichloroethane, 2-Chloroethyl vinyl ether, Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA22766-CAL3 due to ISTD reintegration: Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA22766-CAL4 due to poor integration (peak tailing, baseline selection): Bromomethane, Chloroethane, Methyl tert-butyl ether, 1,4-Dichlorobenzene-d4, 2-Chloroethyl vinyl ether.
The following manual integrations were performed in the sample(s) AA22766-CAL5, AA22766-SCV2 due to ISTD reintegration: Pentafluorobenzene.

057

The following manual integrations were performed in the sample(s) AA22766-CAL5 due to poor integration (peak tailing, baseline selection): 2-Chloroethyl vinyl ether.
The following manual integrations were performed in the sample(s) AA22766-CAL6 due to poor integration (peak tailing, baseline selection): Acetone, 2-Butanone.
The following manual integrations were performed in the sample(s) AA22766-SCV1 due to ISTD reintegration: Pentafluorobenzene, 1,4-Difluorobenzene.
The following manual integrations were performed in the sample(s) AA22766-SCV1 due to poor integration (peak tailing, baseline selection): Bromofluorobenzene.
The following manual integrations were performed in the sample(s) AA22766-SCV2 due to poor integration (peak tailing, baseline selection): Isobutyl Alcohol, Bromofluorobenzene.

Analysis: EPA 8260B
Sequence: AA23761
Affected Sample(s): AA23761-CAL1, AA23761-CAL2, AA23761-CAL3, AA23761-CAL6, AA23761-CAL7, AA23761-SCV1, AA23761-SCV2
Nonconformance: Manual integrations
Additional Information: The following manual integrations were performed in the sample(s) AA23761-CAL1 due to ISTD reintegration: Pentafluorobenzene, 1,4- Difluorobenzene, Chlorobenzene-d5, 1,4-Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) AA23761-CAL2 due to poor integration (peak tailing, baseline selection): Acrolein, Acetone, Chloropropene, Cyclohexane, Methyl Cyclohexane, Methyl Methacrylate, 4-Methyl-2-Pentaone, 2-Chloroethyl vinyl ether.
The following manual integrations were performed in the sample(s) AA23761-CAL2 due to ISTD reintegration and baseline drop for split peaks: Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA23761-CAL2 due to ISTD reintegration and poor integration (peak tailing, baseline selection): 1,4-Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) AA23761-CAL3 due to poor integration (peak tailing, baseline selection): Acrolein, 2-Chloroethyl vinyl ether, Naphthalene.
The following manual integrations were performed in the sample(s) AA23761-CAL6 due to poor integration (peak tailing, baseline selection): Chloroethane.
The following manual integrations were performed in the sample(s) AA23761-CAL7 due to poor integration (peak tailing, baseline selection): Acetone.
The following manual integrations were performed in the sample(s) AA23761-SCV1 due to ISTD reintegration: Pentafluorobenzene, 1,4- Difluorobenzene.
The following manual integrations were performed in the sample(s) AA23761-SCV2 due to ISTD reintegration: Pentafluorobenzene, 1,4- Difluorobenzene, Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) AA23761-SCV2 due to poor integration (peak tailing, baseline selection): Naphthalene.

Analysis: EPA 8260B
Sequence: AA24269
Affected Sample(s): AA24269-CCV1, 3E22013-BS1, 3E22013-BSD1
Nonconformance: Manual integrations
Additional Information: The following manual integrations were performed in the sample(s) AA24269-CCV1 due to ISTD reintegration: Pentafluorobenzene, 1,4-Diflurobenzene.
The following manual integrations were performed in the sample(s) AA24269-CCV1 due to poor integration (peak tailing, baseline selection): Naphthalene.
The following manual integrations were performed in the sample(s) 3E22013-BS1 due to ISTD reintegration: Pentafluorobenzene.
The following manual integrations were performed in the sample(s) 3E22013-BSD1 due to ISTD reintegration: Pentafluorobenzene, 1,4-Diflurobenzene, Chlorobenzene-d5.
The following manual integrations were performed in the sample(s) 3E22013-BSD1 due to poor integration (peak tailing, baseline selection): Chlorobenzene-d5.

Analysis: EPA 8260B
Sequence: AA24312
Affected Sample(s): AA24312-CCV1, 3E24030-BS1, 3E24030-BSD1
Nonconformance: Manual integrations
Additional Information: The following manual integrations were performed in the sample(s) AA24312-CCV1 due to ISTD reintegration: Pentafluorobenzene, 1,4-Difluorobenzene, Chlorobenzene-d5, 1,4-

Dichlorobenzene-d4.
The following manual integrations were performed in the sample(s) 3E24030-BS1 due to incorrect peak selection/peak not found: 1,4-Dioxane.
The following manual integrations were performed in the sample(s) 3E24030-BS1, 3E24030-BSD1 due to ISTD reintegration: Pentafluorobenzene.

Analysis:EPA8081B
Sequence:AA23829
Affected Samples: AA23829-CAL1, AA23829-CAL2
Nonconformance:Manual Integrations
Additional Information: The following manual integrations were performed in the sample(s) AA23829-CAL1, AA23829-CAL 2 due to incorrect peak selection/peak not found: Mirex.

Analysis:EPA8081B
Sequence:AA24376
Affected Samples: AA24376-PEM1, AA24376-CCV1
Nonconformance:Manual Integrations
Additional Information: The following manual integrations were performed in the sample(s) AA24376-PEM1 due to poor integration (peak tailing, baseline selection): 4,4'-DDD.
The following manual integrations were performed in the sample(s) AA24376-CCV1 due to ISTD reintegration: DBC.

Analysis:EPA 8260B
Affected Samples: Veno-SD04-000H [A302870-05]
Nonconformance: The surrogate recovery was outside acceptance limits for 4-Bromofluorobenzene.

Analysis:EPA 8081B
Affected Samples: Veno-SS02-0001 [A302870-02], Veno-SS02-0001 [A302870-02RE1]
Nonconformance: The surrogate recoveries were outside acceptance limits for 2,4,5,6-TCMX and Decachlorobiphenyl, due to suspected matrix interference. The client was informed of the failing surrogate recoveries and matrix issues with the samples. The sample was re-extracted and re-analyzed for confirmation at a dilution. The sample was re-extracted outside of acceptable holding time. The surrogate recovery for 2,4,5,6-TCMX was outside acceptance limits. This is a confirmed matrix effect.

Analysis:EPA 8081B
Affected Samples: Veno-SS06-0001 [A302870-03]
Nonconformance: The sample was analyzed at a dilution due to suspected matrix interference (dark, opaque extract). The surrogate recovery was outside acceptance limits for 2,4,5,6-TCMX. The client was informed of the failing surrogate recoveries and matrix issues with the samples.

Analysis:EPA 8081B
Affected Samples: Veno-SD04-000H [A302870-05]
Nonconformance: The sample was analyzed at a dilution due to suspected matrix interference (dark, opaque extract). The surrogate recovery was outside acceptance limits for 2,4,5,6-TCMX. The client was informed of the failing surrogate recoveries and matrix issues with the samples.

Analysis:EPA 8081B
Affected Samples: Veno-SD04-000H [A302870-05]
Nonconformance: Confirmation result exceeds 40% RPD for 4,4'-DDD and 4,4'-DDE , higher result reported.

Analysis:EPA8081B
Affected Samples: 3A23028-BS1, 3A23028-BSD1
Nonconformance: The RPD result exceeded the QC control limits for Methoxylchlor; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.

Analysis:EPA 8081B
Affected Samples: Veno-SD04-0H01 [A302870-06], Veno-SD05-000H [A302870-07], Veno-SD06-000H

[A302870-08], Veno-SD07P-000H [A302870-10]
Nonconformance: The sample was analyzed at a dilution due to suspected matrix interference (dark, opaque extract). The surrogate recoveries were outside acceptance limits for 2,4,5,6-TCMX and Decachlorobiphenyl. The client was informed of the failing surrogate recoveries and matrix issues with the samples.

Analysis:EPA 8081B
Affected Samples: Veno-SD07-000H [A302870-09], Veno-SD07-000H [A302870-09RE1]
Nonconformance: The sample was analyzed at a dilution due to suspected matrix interference (dark, opaque extract). The surrogate recoveries were outside acceptance limits for 2,4,5,6-TCMX and Decachlorobiphenyl, due to suspected matrix interference. The client was informed of the failing surrogate recoveries and matrix issues with the samples. The sample was re-extracted and re-analyzed for confirmation. The sample was re-extracted outside of acceptable holding time. The surrogate recoveries for 2,4,5,6-TCMX and Decachlorobiphenyl were outside acceptance limits. This is a confirmed matrix effect.

Analysis:EPA 8081B
Affected Samples: Veno-SD07P-000H [A302870-10]
Nonconformance: Confirmation result exceeds 40% RPD for 4,4'-DDD, higher result reported.

Analysis:EPA 8081B
Affected Samples: Veno-SD07P-000H [A302870-10]
Nonconformance: Confirmation result exceeds 40% RPD for 4,4'-DDE, lower result reported.

Analysis:EPA 8081B
Affected Samples: Veno-SS02-0001 [A302870-02], 3E21021-MS1, 3E21021-MSD1, Veno-SS02-0001 [A302870-02RE1], 3F05007-MS1, 3F05007-MSD1
Nonconformance: The spike recovery was outside acceptance limits for 4,4'-DDE and 4,4'-DDT in the MS and/or MSD. The batch was accepted based on acceptable LCS recovery. Due to suspected matrix interference the sample, along with QC was re-extracted. In the MS and MSD re-extraction the spike recoveries were within acceptable limits. Both sets of data are reported.

Analysis:EPA 8081B
Affected Samples: 3E21021-MS1, 3E21021-MSD1
Nonconformance: The surrogate recoveries were outside acceptance limits for 2,4,5,6-TCMX and Decachlorobiphenyl.

Analysis:EPA 8081B
Affected Samples: 3F05007-BLK1, 3F05007-MS1, 3F05007-MSD1
Nonconformance: The surrogate recoveries were outside acceptance limits for 2,4,5,6-TCMX.

Analysis:EPA 8270D
Affected Samples: AA24398-CCV1, Veno-SD04-000H [A302870-05], Veno-SD04-0H01 [A302870-06], Veno-SD05-000H [A302870-07], Veno-SD06-000H [A302870-08], Veno-SD07-000H [A302870-09], Veno-SD07P-000H [A302870-10]
Nonconformance: The associated continuing calibration verification standard exhibited high bias for 2,4-Dinitrophenol, 4-Nitroaniline, and 4-Nitrophenol; since the result is ND, the impact on data quality is minimal.

Analysis:EPA 8270D
Affected Samples: 3E22007-BS1, Veno-SD04-000H [A302870-05], Veno-SD04-0H01 [A302870-06], Veno-SD05-000H [A302870-07], Veno-SD06-000H [A302870-08], Veno-SD07-000H [A302870-09], Veno-SD07P-000H [A302870-10]
Nonconformance: The associated laboratory control sample exhibited high bias for Butylbenzylphthalate; since the result is ND, the impact on data quality is minimal.

Analysis:EPA 8270D
Affected Samples: AA24468-CCV1, Veno-SD04-000H [A302870-05RE1]
Nonconformance: The associated continuing calibration verification standard exhibited high bias for 4-Nitroaniline and 4-Nitrophenol; since the result is ND, the impact on data quality is minimal.

Analysis:EPA 8270D
Affected Samples: 3F06021-BS1, 3F06021-BSD1, Veno-SD04-000H [A302870-05RE1]
Nonconformance: The associated laboratory control sample exhibited high bias for 1,2,4,5-Tetrachlorobenzene, Acetophenone; since the result is ND, the impact on data quality is minimal.

Analysis:EPA 8270D
Affected Samples: Veno-SD04-000H [A302870-05], Veno-SD04-000H [A302870-05RE1]
Nonconformance: Surrogate recovery biased low and outside control limits due to suspected matrix effects for 2,4,6-Tribromophenol, 2-Fluorobiphenyl, 2-Fluorophenol, Nitrobenzene-d5, Phenol-d5, and Terphenyl-d14 evidenced by sample behavior during sample preparation (emulsion formation, excessive foaming). The client was informed of the low surrogate recoveries. The sample was re-extracted and re-analyzed for confirmation. The sample was re-extracted outside of acceptable holding time. The surrogate recoveries were outside acceptance limits for 2,4,6-Tribromophenol, 2-Fluorobiphenyl, 2-Fluorophenol, Nitrobenzene-d5, Phenol-d5, and Terphenyl-d14. This is a confirmed matrix effect. Both sets of data are reported.

Analysis:EPA 8270D
Affected Samples: Veno-SD04-0H01 [A302870-06], Veno-SD05-000H [A302870-07], Veno-SD06-000H [A302870-08]
Nonconformance: Surrogate recovery biased low and outside control limits due to suspected matrix effects for 2,4,6-Tribromophenol, 2-Fluorobiphenyl, 2-Fluorophenol, Nitrobenzene-d5, Phenol-d5, and Terphenyl-d14 evidenced by sample behavior during sample preparation (emulsion formation, excessive foaming). The client was informed of the low surrogate recoveries.

Analysis:EPA 8270D
Affected Samples: Veno-SD07P-000H [A302870-10]
Nonconformance: Surrogate recovery biased low and outside control limits due to suspected matrix effects for 2-Fluorobiphenyl evidenced by sample behavior during sample preparation (emulsion formation, excessive foaming). The client was informed of the low surrogate recoveries.

Analysis:EPA 8270D
Affected Samples: AA24423-CCV1, Veno-EB01-051713-SD [A302870-11]
Nonconformance: The associated continuing calibration verification standard exhibited high bias for 4-Nitrophenol; since the result is ND, the impact on data quality is minimal.

Analysis:EPA 8270D
Affected Samples: 3E22001-BS1, 3E22001-BSD1, Veno-EB01-051713-SD [A302870-11]
Nonconformance: The associated laboratory control sample exhibited high bias for 2,3,4,6-Tetrachlorobenzene, Atrazine, and Benzaldehyde; since the result is ND, the impact on data quality is minimal.

Analysis: EPA 9045D
Affected Samples:Veno-SS03-0001 [A302870-01], Veno-SS02-0001 [A302870-02], Veno-SS06-0001 [A302870-03], Veno-SD04-000H [A302870-05], Veno-SD04-0H01 [A302870-06], Veno-SD05-000H [A302870-07], Veno-SD06-000H [A302870-08], Veno-SD07-000H [A302870-09], Veno-SD07P-000H [A302870-10]
Nonconformance: Samples were received into the laboratory outside acceptable holding time. The results are reported as qualified out of hold.

Subcontracted Analysis
Subcontracted analysis will be submitted under separate report. A summary of subcontracted analysis and samples is outlined below.
Analysis: ASTM D422
Samples: Veno-SS03-0001 [A302870-01], Veno-SS02-0001 [A302870-02], Veno-SS06-0001 [A302870-03]

PROJECT NARRATIVE

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy package and in computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures.

Digitally signed by Marcia Colon
Reason: I am the author of this document
Date: 2013.06.12 12:38:01 -04'00'

Marcia Colon
June 12, 2013

Project Manager

Environmental Conservation Labs, Inc.
10775 Central Port Drive
Orlando, FL 32824

phone: (407) 826-5314

ELECTRONIC CHAIN OF CUSTODY RECORD

A-308870

C.O.C. 20130517-UsChemLugon-ENCO-01

Report to: PLEASE PRINT
Company Name: CH2MHILL
Address: 15010 Conference Dr. ; 200
Chantilly, VA 20151
Attn: Mike Zamboni
Phone: 703.376.5301
Fax: 703.376.5801

Invoice to: PLEASE PRINT
Company Name: See Contact
Address:
Attn:
Phone:
Fax:

Project Name/Number: Terrestrial UXO Site Sampling/424181.FLFK.04
Sampler (Print): not required
Purchase Order Number: 948828
Sampler (Signature): not required

Date Shipped: 5/17/13
Carrier: FedEx
Waybill No.: 799789151057
Comments:

Sample Identification	Location	Date Collected	Time Collected	Time Zone	No. of Containers	Aq	Sed.	Soil		Analysis Requested/Method Number: Metals (TCL+Tentatively Identified)	SW-846 8270D	SW-846 8260D	SW-846 8260D	TOC	ASTM D422							
VENO-SS03-0001		5/16/13	14:20	AST	2			✓				X	X	X	X							
VENO-SS02-0001		5/16/13	14:35	AST	2			✓				X	X	X	X							
VENO-SS02-0001-MS		5/16/13	14:35	AST	1			✓				X										
VENO-SS02-0001-SD		5/16/13	14:35	AST	1			✓				X										
VENO-SS06-0001		5/16/13	15:10	AST	2			✓				X	X	X	X							
VENO-EB02-051613-SS		5/16/13	06:45	AST	1	✓						X										
									✓													
									✓													
									✓													
									✓													
									✓													

Shuttle Temperature:
Turnaround Requested: Check one ☑ Std. 28 days ☐ One week ☐ 24/48 Hrs. ☐ Other
Sample Disposal: ☐ Return to client ☐ Disposal by Lab (30 days received) not applicable

Relinquished by sampler:	Date	Time	Received by:	Relinquished by:	Date	Time	Received by:
[signature]	5/17/13	1225	[signature] 5/18/13 0825				
Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received at lab by:

White: Return to client with report Yellow: Laboratory Copy Pink: Sampler

Note: The first sampled date of the ARF will be used as the COC number unless indicated otherwise.

Environmental Conservation Labs, Inc.
10775 Central Port Drive
Orlando, FL 32824

phone: (407) 826-5314

ELECTRONIC CHAIN OF CUSTODY RECORD

A3028710

C.O.C. 20130517-1-CH2MHILL-Lagoon-CHAIN-02

Report to: PLEASE PRINT

Company Name: CH2MHILL Phone: 703.376.5301

Address: 15010 Conference Dr. ; 200
Chantilly, VA 20151 Fax: 703.376.5801

Attn: Mike Zamboni

Invoice to: PLEASE PRINT

Company Name: See Contact Phone:

Address: Fax:

Attn:

Project Name/Number: Terrestrial UXO Site Samples/424191.FUFK04

Sampler (Print): not required

Purchase Order Number: 948828

Sampler (Signature): not required

Date Shipped: 5/17/13
Carrier: FedEx
Waybill No.: 799789275756
Comments:

Sample Identification	Location	Date Collected	Time Collected	Time Zone	No. of Containers	Matrix: Aq	Matrix: Sed.	Matrix: Soil	Matrix:	Analysis Requested/Method Number: [illegible]	[illegible]	[illegible]	[illegible]	TOC	[illegible]						
VENO-SD04-000H		5/17/13	08:35	AST	5		✓			X	X	X	X	X	X						
VENO-SD04-0H01		5/17/13	08:20	AST	5		✓			X	X	X	X	X	X						
VENO-SD05-000H		5/17/13	09:10	AST	5		✓			X	X	X	X	X	X						
VENO-SD06-000H		5/17/13	09:35	AST	5		✓			X	X	X	X	X	X						
VENO-SD07-000H		5/17/13	10:15	AST	5		✓			X	X	X	X	X	X						
VENO-SD07P-000H		5/17/13	10:15	AST	4		✓			X	X	X									
VENO-EB01-051713-SD		5/17/13	07:00	AST	5	✓				X	X	X									
VENO-TB01-051713-SD		5/17/13	11:45	AST	2	✓				X											
									✓												
									✓												
									✓												

Shuttle Temperature:

Turnaround Requested: Check one
☑ Standard 28 days ☐ One week ☐ 24/48 Hrs. ☐ Other

Sample Disposal:
☐ Return to client ☐ Disposal by Lab (fee applies)

not applicable

Relinquished by sampler:	Date: 5/17/13	Time: 12:35	Received by:	Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:	Relinquished by:	Date	Time	Received at lab by:

White: Return to client with report Yellow: Laboratory Copy Pink: Sampler

Note: The first sampled date of the ARF will be used as the COC number unless indicated otherwise.

064

A302870

ENCO Orlando

Client:	**CH2M Hill, Inc. (CH029)**	**Lab Project Mgr:**	**Marcia Colon**
Project:	**East Vieques La Chiva SWMU 1, CTO-0037**	**Project Number:**	**408040**
PO #:	**948828**		

Report To:

CH2M Hill, Inc. (CH029)
Michael Zamboni
15010 Conference Center Drive, Suite 200
Chantilly, VA 20151
Phone: (703) 376-5301
Fax:

Invoice To:

CH2M Hill, Inc. (CH029)
Accounts Payable
PO Box 241329
Denver, CO 80224
Phone :(703) 376-5301
Fax:

Client Notes

Project Notes

Work Order Notes

NOTE: These are International Samples from Puerto Rico. JAJ 5/18/13.

Date Due:	10-Jun-13 17:00 (14 day TAT)		
Received By:	Jennifer A. Jones	Date Received:	18-May-13 09:25
Logged In By:	Jennifer A. Jones	Date Logged In:	18-May-13 12:20

Cooler: LG-64 received at 2.0°C

Containers Intact	Y	Containers Properly Preserved	Y	Proper Containers Received	Y	COC/Labels Agree	Y	Custody Seals Intact	Y
Volatile Containers Preserved	Y	Volatile Containers Headspace Fre	Y	Aqueous Samples Checked for Residual Cl	N	All Samples in PreLog Received	N	Received On Ice	Y

Cooler: ORL-2227 received at 2.0°C

Containers Intact	Y	Containers Properly Preserved	Y	Proper Containers Received	Y	COC/Labels Agree	Y	Custody Seals Intact	Y
Volatile Containers Preserved	Y	Volatile Containers Headspace Fre	Y	Aqueous Samples Checked for Residual Cl	N	All Samples in PreLog Received	N	Received On Ice	Y

Analysis	Due	TAT	Expires	Status	Comments
A302870-01 VENO-SS03-0001 [Soil] Sampled 16-May-13 14:20 Eastern					
8081B DOD	10-Jun-13 15:00	14	30-May-13 14:20	Received	DDD,DDE,DDT only
pH 9045D DOD	10-Jun-13 15:00	14	16-May-13 14:34	Received	
Solids, Dry Weight	10-Jun-13 15:00	14	12-Nov-13 14:20	Received	Auto-Included
TOC Walkley Black DOD	10-Jun-13 15:00	14	15-Jun-13 14:20	Received	
A302870-02 VENO-SS02-0001 [Soil] Sampled 16-May-13 14:35 Eastern					
8081B DOD	10-Jun-13 15:00	14	30-May-13 14:35	Received	DDD,DDE,DDT only; MS/MSD on 8081B only, JAJ 5/18/13.
pH 9045D DOD	10-Jun-13 15:00	14	16-May-13 14:49	Received	MS/MSD on 8081B only, JAJ 5/18/13.
Solids, Dry Weight	10-Jun-13 15:00	14	12-Nov-13 14:35	Received	MS/MSD on 8081B only, JAJ 5/18/13.
TOC Walkley Black DOD	10-Jun-13 15:00	14	15-Jun-13 14:35	Received	MS/MSD on 8081B only, JAJ 5/18/13.

A302870

ENCO Orlando

Client:	CH2M Hill, Inc. (CH029)	Lab Project Mgr:	Marcia Colon
Project:	East Vieques La Chiva SWMU 1, CTO-0037	Project Number:	408040
PO #:	948828		

Analysis	Due	TAT	Expires	Status	Comments
A302870-03 VENO-SS06-0001 [Soil] Sampled 16-May-13 15:10 Eastern					
8081B DOD	10-Jun-13 15:00	14	30-May-13 15:10	Received	DDD,DDE,DDT only
pH 9045D DOD	10-Jun-13 15:00	14	16-May-13 15:24	Received	
Solids, Dry Weight	10-Jun-13 15:00	14	12-Nov-13 15:10	Received	Auto-Included
TOC Walkley Black DOD	10-Jun-13 15:00	14	15-Jun-13 15:10	Received	
A302870-04 VENO-EB02-051613-SS [Water] Sampled 16-May-13 06:45 Eastern					
8081B DOD	10-Jun-13 15:00	14	23-May-13 06:45	Received	DDD,DDE,DDT only
A302870-05 VENO-SD04-000H [Soil] Sampled 17-May-13 08:35 Eastern					
8081B DOD	10-Jun-13 15:00	14	31-May-13 08:35	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 08:35	Received	
8270D TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 08:35	Received	
pH 9045D DOD	10-Jun-13 15:00	14	17-May-13 08:49	Received	
Solids, Dry Weight	10-Jun-13 15:00	14	13-Nov-13 08:35	Received	
TOC Walkley Black DOD	10-Jun-13 15:00	14	16-Jun-13 08:35	Received	
A302870-06 VENO-SD04-0H01 [Soil] Sampled 17-May-13 08:20 Eastern					
8081B DOD	10-Jun-13 15:00	14	31-May-13 08:20	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 08:20	Received	
8270D TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 08:20	Received	
pH 9045D DOD	10-Jun-13 15:00	14	17-May-13 08:34	Received	
Solids, Dry Weight	10-Jun-13 15:00	14	13-Nov-13 08:20	Received	
TOC Walkley Black DOD	10-Jun-13 15:00	14	16-Jun-13 08:20	Received	
A302870-07 VENO-SD05-000H [Soil] Sampled 17-May-13 09:10 Eastern					
8081B DOD	10-Jun-13 15:00	14	31-May-13 09:10	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 09:10	Received	
8270D TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 09:10	Received	
pH 9045D DOD	10-Jun-13 15:00	14	17-May-13 09:24	Received	
Solids, Dry Weight	10-Jun-13 15:00	14	13-Nov-13 09:10	Received	
TOC Walkley Black DOD	10-Jun-13 15:00	14	16-Jun-13 09:10	Received	

A302870

ENCO Orlando

Client:	**CH2M Hill, Inc. (CH029)**	**Lab Project Mgr:**	**Marcia Colon**
Project:	**East Vieques La Chiva SWMU 1, CTO-0037**	**Project Number:**	**408040**
PO #:	**948828**		

Analysis	Due	TAT	Expires	Status	Comments
A302870-08 VENO-SD06-000H [Soil] Sampled 17-May-13 09:35 Eastern					
8081B DOD	10-Jun-13 15:00	14	31-May-13 09:35	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 09:35	Received	
8270D TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 09:35	Received	
pH 9045D DOD	10-Jun-13 15:00	14	17-May-13 09:49	Received	
Solids, Dry Weight	10-Jun-13 15:00	14	13-Nov-13 09:35	Received	
TOC Walkley Black DOD	10-Jun-13 15:00	14	16-Jun-13 09:35	Received	
A302870-09 VENO-SD07-000H [Soil] Sampled 17-May-13 10:15 Eastern					
8081B DOD	10-Jun-13 15:00	14	31-May-13 10:15	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 10:15	Received	
8270D TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 10:15	Received	
pH 9045D DOD	10-Jun-13 15:00	14	17-May-13 10:29	Received	
Solids, Dry Weight	10-Jun-13 15:00	14	13-Nov-13 10:15	Received	
TOC Walkley Black DOD	10-Jun-13 15:00	14	16-Jun-13 10:15	Received	
A302870-10 VENO-SD07P-000H [Soil] Sampled 17-May-13 10:15 Eastern					
8081B DOD	10-Jun-13 15:00	14	31-May-13 10:15	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 10:15	Received	
8270D TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 10:15	Received	
Solids, Dry Weight	10-Jun-13 15:00	14	13-Nov-13 10:15	Received	
A302870-11 VENO-EB01-051713-SD [Water] Sampled 17-May-13 07:00 Eastern					
8081B DOD	10-Jun-13 15:00	14	24-May-13 07:00	Received	DDD,DDE,DDT only
8260B TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 07:00	Received	
8270D TCL SOM01.2 DOD	10-Jun-13 15:00	14	24-May-13 07:00	Received	
A302870-12 VENO-TB01-051713-SD [Water] Sampled 17-May-13 11:45 Eastern					
8260B TCL SOM01.2 DOD	10-Jun-13 15:00	14	31-May-13 11:45	Received	
Kemron Environmental Service					
A302870-01 VENO-SS03-0001 [Soil] Sampled 16-May-13 14:20 Eastern					
Grain Size ASTM D422	10-Jun-13 15:00	14	13-Jun-13 14:20	SubContracted	to Kemron
A302870-02 VENO-SS02-0001 [Soil] Sampled 16-May-13 14:35 Eastern					
Grain Size ASTM D422	10-Jun-13 15:00	14	13-Jun-13 14:35	SubContracted	
A302870-03 VENO-SS06-0001 [Soil] Sampled 16-May-13 15:10 Eastern					
Grain Size ASTM D422	10-Jun-13 15:00	14	13-Jun-13 15:10	SubContracted	to Kemron

067

WORK ORDER

Printed: 5/20/2013 11:28:11AM

A302870

ENCO Orlando

Client:	CH2M Hill, Inc. (CH029)	Lab Project Mgr:	Marcia Colon
Project:	East Vieques La Chiva SWMU 1, CTO-0037	Project Number:	408040
PO #:	948828		

Analysis	Due	TAT	Expires	Status	Comments
Kemron Environmental Service					
A302870-05 VENO-SD04-000H [Soil] Sampled 17-May-13 08:35 Eastern					
Grain Size ASTM D422	10-Jun-13 15:00	14	14-Jun-13 08:35	SubContracted	to Kemron
A302870-06 VENO-SD04-0H01 [Soil] Sampled 17-May-13 08:20 Eastern					
Grain Size ASTM D422	10-Jun-13 15:00	14	14-Jun-13 08:20	SubContracted	to Kemron
A302870-07 VENO-SD05-000H [Soil] Sampled 17-May-13 09:10 Eastern					
Grain Size ASTM D422	10-Jun-13 15:00	14	14-Jun-13 09:10	SubContracted	to Kemron
A302870-08 VENO-SD06-000H [Soil] Sampled 17-May-13 09:35 Eastern					
Grain Size ASTM D422	10-Jun-13 15:00	14	14-Jun-13 09:35	SubContracted	to Kemron
A302870-09 VENO-SD07-000H [Soil] Sampled 17-May-13 10:15 Eastern					
Grain Size ASTM D422	10-Jun-13 15:00	14	14-Jun-13 10:15	SubContracted	to Kemron

068

Reviewed By

Date

YES NO N/A

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: A302870 LAB: ENCO

SITE NAME: East Vieques La Chiva SWMU 1

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format or CLP Forms Equivalent? [✓] ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative, and/or cover letter signed release present? [✓] ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? [✓] ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

II. VOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Reports, and/or Chain of Custodies from the field samplers present for all samples sign release present? [✓] ___ ___

ACTION: If no, contact the laboratory/sampling team for replacement of missing or illegible copies.

1.2 Is a sampling trip report present (if required)? [✓] ___ ___

1.3 Sample Conditions/Problems

YES NO N/A

1.3.1 Do the Traffic Reports, Chain of Custodies, or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ✓ ___ 070313

ACTION: If all the VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, flag all positive results "J" and all non-detects "R".

See attached sheet

ACTION: If samples were not iced or if the ice was melted upon receipt at the laboratory and the temperature of the cooler was elevated (>10°C), flag all positive results "J" and all non-detects non"UJ".

2.0 Holding Times temp 2°C

2.1 Have any volatile holding times, determined from date of collection to date of analysis, been exceeded? ___ ✓ ___

The maximum holding time for aqueous samples is 14 days.

The maximum holding time for soils non aqueous samples is 14 days.

NOTE: If unpreserved, aqueous samples maintained at 4°C for aromatic hydrocarbons analysis must be analyzed within 7 days. If preserved with HCL acid to a pH<2 and stored at 4°C, then aqueous samples must be analyzed within 14 days from time of collection. For non-aqueous samples for volatile components that are frozen (less than 7°C) or are properly cooled (4°C ± 2°C) and perserved with $NaHSO_4$, the maximum holding time is 14 days from sample collection. If

HOLDING TIME SUMMARY

EPA 8260B

Laboratory: ENCO Orlando

SDG: A302870-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
VENO-SD04-000H	05/17/13 08:35	05/18/13 09:25	05/22/13 13:16	NA	NA	05/22/13 14:15	5.00	14.00	
VENO-SD04-0H01	05/17/13 08:20	05/18/13 09:25	05/22/13 13:16	NA	NA	05/22/13 14:48	5.00	14.00	
VENO-SD05-000H	05/17/13 09:10	05/18/13 09:25	05/22/13 13:16	NA	NA	05/22/13 15:20	5.00	14.00	
VENO-SD06-000H	05/17/13 09:35	05/18/13 09:25	05/22/13 13:16	NA	NA	05/22/13 15:52	5.00	14.00	
VENO-SD07-000H	05/17/13 10:15	05/18/13 09:25	05/22/13 13:16	NA	NA	05/22/13 16:24	5.00	14.00	
VENO-SD07P-000H	05/17/13 10:15	05/18/13 09:25	05/22/13 13:16	NA	NA	05/22/13 16:56	5.00	14.00	
VENO-EB01-051713-SD	05/17/13 07:00	05/18/13 09:25	05/24/13 12:57	NA	NA	05/24/13 16:14	7.00	14.00	
VENO-TB01-051713-SD	05/17/13 11:45	05/18/13 09:25	05/24/13 12:57	NA	NA	05/24/13 16:44	7.00	14.00	

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 302870

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	% Moisture
VENO-SD04-000H	76.15
VENO-SD04-0H01	68.45
VENO-SD05-000H	72.18
VENO-SD06-000H	63.09

YES NO N/A

uncertain about preservation, contact the laboratory /sampling team to determine whether or not samples were preserved.

ACTION: Qualify sample results according to Table 1:

Table 1. Holding Time Actions for Trace Volatile Analysis

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤7 days	No qualifications	
	No	> 7 days	J	R
	Yes	≤14 days	No qualifications	
	Yes	> 14 days	J	R
Non Aqueous	No	≤ 14 days	J	R
	Yes	≤ 14 days	No qualifications	
	Yes/No	> 14 days	J	R

3.0 Surrogate Recovery (CLP Form II Equivalent)

3.1 Have the volatile surrogate recoveries been listed on Surrogate Recovery forms for each of the following matrices:

a. Water ☑ ___ ___

b. Soil ☑ ___ ___

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery forms for each matrix:

a. Water ☑ ___ ___

b. Soil ☑ ___ ___

ACTION: If large errors exist, deliverables are unavailable or information is missing, document the effect(s) in Data

YES NO N/A

Assessments and contact the laboratory/project officer/appropriate official for an explanation /resubmittal, make any necessary corrections and document effect in the Data Assessment.

3.3 Were the surrogate recovery limits followed per Table 2. If Table 2 criteria were not followed, the laboratory may use in-house performance criteria (per SW-846, Method 8000C, section 9.7). Other compounds may be used as surrogates, depending upon the analysis requirements. Lab [✓] ___ ___

Table 2. Surrogate Spike Recovery Limits for Water and Soil/Sediments

DMC	Recovery Limits (%)Water	Recovery Limits Soil/Sediment
4-Bromofluorobenzene	80-120	70-130
Dibromofluoromethane	80-120	70-130
Toluene-d_8	80-120	70-130
Dichloroethane-d_4	80-120	70-130

Note: Use above table if laboratory did not provide in house recovery criteria.

Note: Other compounds may be used as surrogated depending upon the analysis requirements.

3.4 Were outliers marked correctly with an asterisk? [✓] ___ ___

ACTION: Circle all outliers with a red pencil.

3.5 Were one or more volatile surrogate recoveries out of specification for any sample or method blank. Table 2. [✓] ___ ___

If yes, were samples reanalyzed? [ ] [✓] ___
See attached e-mail from Lab
Were method blanks reanalyzed? [ ] ___ [✓]

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24269	Instrument:	OVGCMS2
Matrix:	Soil	Calibration:	1301045

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA24269-CCV1)			Lab File ID: 2EQ002.D		Analyzed: 05/22/13 11:48			
Dibromofluoromethane	50.0	86	80 - 120	10.9	10.898	0.0020	+/-1.0	
Toluene-d8	50.0	102	80 - 120	13.16	13.16	0.0000	+/-1.0	
4-Bromofluorobenzene	50.0	96	80 - 120	15.68	15.674	0.0060	+/-1.0	
LCS (3E22013-BS1)			Lab File ID: 2EQ003.D		Analyzed: 05/22/13 12:29			
Dibromofluoromethane	0.0500	90	74 - 133	10.9	10.898	0.0020	+/-1.0	
Toluene-d8	0.0500	104	85 - 115	13.16	13.16	0.0000	+/-1.0	
4-Bromofluorobenzene	0.0500	94	85 - 120	15.67	15.674	-0.0040	+/-1.0	
LCS Dup (3E22013-BSD1)			Lab File ID: 2EQ004.D		Analyzed: 05/22/13 13:01			
Dibromofluoromethane	0.0500	85	74 - 133	10.91	10.898	0.0120	+/-1.0	
Toluene-d8	0.0500	102	85 - 115	13.16	13.16	0.0000	+/-1.0	
4-Bromofluorobenzene	0.0500	93	85 - 120	15.67	15.674	-0.0040	+/-1.0	
Blank (3E22013-BLK1)			Lab File ID: 2EQ005.D		Analyzed: 05/22/13 13:33			
Dibromofluoromethane	0.0500	89	74 - 133	10.92	10.898	0.0220	+/-1.0	
Toluene-d8	0.0500	98	85 - 115	13.17	13.16	0.0100	+/-1.0	
4-Bromofluorobenzene	0.0500	90	85 - 120	15.68	15.674	0.0060	+/-1.0	
VENO-SD04-000H (A302870-05)			Lab File ID: 2EQ006.D		Analyzed: 05/22/13 14:15			
Dibromofluoromethane	0.288	83	74 - 133	10.91	10.898	0.0120	+/-1.0	
Toluene-d8	0.288	92	85 - 115	13.17	13.16	0.0100	+/-1.0	
4-Bromofluorobenzene	0.288	82	85 - 120	15.68	15.674	0.0060	+/-1.0	*
VENO-SD04-0H01 (A302870-06)			Lab File ID: 2EQ007.D		Analyzed: 05/22/13 14:48			
Dibromofluoromethane	0.190	86	74 - 133	10.92	10.898	0.0220	+/-1.0	
Toluene-d8	0.190	97	85 - 115	13.17	13.16	0.0100	+/-1.0	
4-Bromofluorobenzene	0.190	87	85 - 120	15.68	15.674	0.0060	+/-1.0	
VENO-SD05-000H (A302870-07)			Lab File ID: 2EQ008.D		Analyzed: 05/22/13 15:20			
Dibromofluoromethane	0.252	85	74 - 133	10.91	10.898	0.0120	+/-1.0	
Toluene-d8	0.252	95	85 - 115	13.17	13.16	0.0100	+/-1.0	
4-Bromofluorobenzene	0.252	86	85 - 120	15.68	15.674	0.0060	+/-1.0	
VENO-SD06-000H (A302870-08)			Lab File ID: 2EQ009.D		Analyzed: 05/22/13 15:52			
Dibromofluoromethane	0.196	86	74 - 133	10.91	10.898	0.0120	+/-1.0	
Toluene-d8	0.196	97	85 - 115	13.17	13.16	0.0100	+/-1.0	
4-Bromofluorobenzene	0.196	88	85 - 120	15.68	15.674	0.0060	+/-1.0	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24312	Instrument:	OVGCMS3
Matrix:	Water	Calibration:	1304028

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA24312-CCV1)			Lab File ID: 3ES002.D		Analyzed: 05/24/13 14:07			
Dibromofluoromethane	50.0	104	80 - 120	11.07	11.085	-0.0150	+/-0.5	
Toluene-d8	50.0	117	80 - 120	13.33	13.34667	-0.0167	+/-0.5	
4-Bromofluorobenzene	50.0	109	80 - 120	15.88	15.9	-0.0200	+/-0.5	
LCS (3E24030-BS1)			Lab File ID: 3ES003.D		Analyzed: 05/24/13 14:44			
Dibromofluoromethane	50.0	99	85 - 115	11.07	11.085	-0.0150	+/-0.5	
Toluene-d8	50.0	110	85 - 120	13.33	13.34667	-0.0167	+/-0.5	
4-Bromofluorobenzene	50.0	102	75 - 120	15.88	15.9	-0.0200	+/-0.5	
LCS Dup (3E24030-BSD1)			Lab File ID: 3ES004.D		Analyzed: 05/24/13 15:14			
Dibromofluoromethane	50.0	99	85 - 115	11.07	11.085	-0.0150	+/-0.5	
Toluene-d8	50.0	114	85 - 120	13.33	13.34667	-0.0167	+/-0.5	
4-Bromofluorobenzene	50.0	93	75 - 120	15.88	15.9	-0.0200	+/-0.5	
Blank (3E24030-BLK1)			Lab File ID: 3ES005.D		Analyzed: 05/24/13 15:44			
Dibromofluoromethane	50.0	97	85 - 115	11.07	11.085	-0.0150	+/-0.5	
Toluene-d8	50.0	103	85 - 120	13.34	13.34667	-0.0067	+/-0.5	
4-Bromofluorobenzene	50.0	102	75 - 120	15.88	15.9	-0.0200	+/-0.5	
VENO-EB01-051713-SD (A302870-11)			Lab File ID: 3ES006.D		Analyzed: 05/24/13 16:14			
Dibromofluoromethane	50.0	107	85 - 115	11.07	11.085	-0.0150	+/-0.5	
1,2-Dichloroethane-d4	50.0	129	70 - 120	11.64	11.65833	-0.0183	+/-0.5	* J⊕
Toluene-d8	50.0	109	85 - 120	13.33	13.34667	-0.0167	+/-0.5	*
4-Bromofluorobenzene	50.0	104	75 - 120	15.89	15.9	-0.0100	+/-0.5	
VENO-TB01-051713-SD (A302870-12)			Lab File ID: 3ES007.D		Analyzed: 05/24/13 16:44			
Dibromofluoromethane	50.0	103	85 - 115	11.07	11.085	-0.0150	+/-0.5	
1,2-Dichloroethane-d4	50.0	123	70 - 120	11.65	11.65833	-0.0083	+/-0.5	* J⊕
Toluene-d8	50.0	105	85 - 120	13.33	13.34667	-0.0167	+/-0.5	*
4-Bromofluorobenzene	50.0	105	75 - 120	15.88	15.9	-0.0200	+/-0.5	

* no ⊕ in samples, no qual

YES NO N/A

ACTION: If all surrogate recoveries are > 10% but 1 or more compounds do not meet method specifications:

1. Flag all positive results as estimated ("J").
2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.
3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects, but qualify positive results as estimated "J".

If any surrogate has a recovery of < 10%:

1. Positive results are qualified with ("J").
2. Non-detects for that should be qualified as unusable ("R").

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. The basic concern is whether the blank problems represent an isolated problem with the blank alone or whether there is a fundamental problem with the analytical process. If one or more samples in the batch show acceptable surrogate recoveries, the reviewer may choose the blank problem to be an isolated occurrence.

3.6 Are there any transcription/calculation errors between raw data and reported data? [ ] [✓] ___

ACTION: If large errors exist, take action as specified in section 3.2 above.

4.0 <u>Laboratory Control Sample(Form III/Equivalent)</u>

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples of a similar matrix, per SDG. [✓] ___ ___

YES NO N/A

Note: LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

4.2 Were the Laboratory Control Samples analyzed at the required frequency for each of the following matrices:

A. Water [✓] ___ ___

B. Soil [✓] ___ ___

C. Med Soil [ ] ___ ___

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

4.3 Have in house LCS recovery limits been developed (Method 8000C, Sect 9.7). [✓] ___ ___

4.4 If in house limits are not developed, are LCS acceptance recovery limits between 70 - 130% (Method 8000c Sect 9.5)? [ ] ___ [✓]

4.5 Were one or more of the volatile LCS recoveries outside the in house laboratory recovery criteria for spiked analytes? If in house limits are not present use 70 - 130% recovery limits. [ ] [✓] ___

YES NO N/A

Table 3. LCS Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	Non-Detected Spiked Compounds
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

5.0 Matrix Spikes(Form III or equivalent)

No MS/MSD

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? [ ] ___ ✓

NOTE: The laboratory should use one matrix spike and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If the sample is not expected to contain target analytes, a MS/MSD should be analyzed (SW-846, Method 8260B, Sect 8.4.2).

5.2 Have MS/MD or MS/MSD results been summarized on modified CLP Form III? [ ] ___ ✓

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples

YES NO N/A

of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000C, section 9.5.])

a. Water [ ] ___ ✓

b. Waste [ ] ___ ✓

c. Soil/Solid [ ] ___ ✓

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene. The concentration of the LCS should be determined as described SW-Method 8000C Section 9.5.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 Have in house MS recovery limits been developed (Method 8000C, Sect 9.7)for each matrix. [ ] ___ ✓

5.5 Were one or more of the volatile MS/MSD recoveries outside of the in-house laboratory recovery criteria for spiked analytes? If none are present, then use 70-130% recovery as per SW-846, 8000C, Sect. 9.5.4. [ ] ___ ✓

ACTION: Circle all outliers with a red pencil.

NOTE: If any individual % recovery in the MS (or MSD) falls outside the designated range for recovery the reviewer should determine if there is a matrix effect. A matrix effect is indicated if the LCS data are within limits but the MS data exceeds the limits.

YES NO N/A

NOTE: No qualification of data is necessary on MS and MSD data alone. However, using informed professional judgement, the data reviewer may use MS and MSD results in conjunction with other QC criteria to determine the need for some qualification.

Note: The data reviewer should first try to determine to what extent the results of the MS and MSD affect the associated data. This determination should be made with regard to he MS and MSD sample itself, as well as specific analytes for all samples associated with the MS and MSD.

Note: In those instances where it can be determine that the results of the MS and MSD affect only the sample spiked, limit qualification to this sample only. However, it may be determined through the MS and MSD results that a laboratory is having a systematic problem in the analysis of one or more analytes that affect all associated samples, and the reviewer must use professional judgement to qualify the data from all associated samples.

Note: The reviewer must use professional judgement to determine the need for qualification of non-spiked compounds.

ACTION: Follow criteria in Table 4 when professional judgement deems qualification of sample.

Table 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	Non-Detected Spiked Compounds
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

	YES	NO	N/A
6.0 Blank (CLP Form IV Equivalent)			
6.1 Is the Method Blank Summary form present?	[✓]	___	___
6.2 Frequency of Analysis: Has a method blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch?	[✓]	___	___
6.3 Has a method blank been analyzed for each GC/MS system used ?	[✓]	___	___

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject ® all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.4 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts. Is the chromatographic performance (baseline stability) for each instrument acceptable for volatile organic compounds?	[✓]	___	___

7.0 Contamination			

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary.	[ ]	[✓]	___

	YES	NO	N/A
7.2 Do any field/rinse blanks have positive volatile organic compound results?		✓	

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 5 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

VEN0-TB01-051713-SD NO⊕

VEN0-EB01-051713-SD NO⊕

Table 5. Volatile Organic Analysis Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, Field, Trip, Instrument**	Detects	Not detected	No qualification
	< CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	> CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U, or qualify the data as unusable R
		≥ CRQL and ≥ blank contamination	Use professional judgement
	= CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	Gross contam-ination	Detects	Qualify results as unusable R

* 2x the CRQL for methylene chloride, 2-butanone, and acetone

** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 ug/L.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected volatile organic target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

YES NO N/A

7.3 Are there field/rinse/equipment blanks associated with every sample? ✓ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 GC/MS Apparatus and Materials

8.1 Did the lab use the proper gas chromatographic column(s) for analysis of volatiles by Method 8260B? Check raw data, instrument logs or contact the lab to determine what type of column(s) was (were) used. ✓ ___ ___

NOTE: For the analysis of volatiles, the method requires the use of 60 m. x 0.75 mm capillary column, coated with VOCOL(Supelco) or equivalent column. (see SW-846, page 8260B-7, section 4.9.2)

ACTION: If the specified column, or equivalent, was not used, document the effects in the Data Assessment. Use professional judgement to determine the acceptability of the data.

9.0 GC/MS Instrument Performance Check (CLP Form V Equivalent)

9.1 Are the GC/MS Instrument Performance Check forms present for Bromofluorobenzene (BFB), and do these forms list the associated samples with date/time analyzed? ✓ ___ ___

9.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift? ✓ ___ ___

9.3 Has an instrument performance check solution (BFB)

YES NO N/A

been analyzed for every twelve hours of sample analysis per instrument?(see Table 4, SW-846, page 8260B-36) ✓ ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS GC/MS tuning data are available.

ACTION: If the laboratory/project officer cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable, "R".

9.4 Have the ion abundances been normalized to m/z 95? ✓ ___ ___

9.5 Have the ion abundance criteria been met for each instrument used? ✓ ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If ion abundance criteria are not met, take action as specified in section 3.2.

9.6 Are there any transcription/calculation errors between mass lists and reported values? (Check at least two values but if errors are found, check more.) ___ ✓ ___

9.7 Have the appropriate number of significant figures (two) been reported? ✓ ___ ___

ACTION: If large errors exist, take action as specified in section 3.2.

9.8 Are the spectra of the mass calibration compounds acceptable. ✓ ___ ___

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

	YES	NO	N/A
10.0 Target Analytes (CLP Form I Equivalent)			
10.1 Are the Organic Analysis reporting forms present with required header information on each page, for each of the following:			
a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates			✓
c. Blanks	✓		
d. Laboratory Control Samples	✓		
10.2 Are the reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?			
a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)			✓
c. Blanks	✓		
d. Laboratory Control Samples	✓		

ACTION: If any data are missing, take action specified in 3.2 above.

	YES	NO	N/A
10.3 Is chromatographic performance acceptable with respect to:			
Baseline stability?	✓		

	YES	NO	N/A
Resolution?	✓		
Peak shape?	✓		
Full-scale graph (attenuation)?	✓		
Other:_____			

ACTION: Use professional judgement to determine the acceptability of the data.

10.4 Are the lab-generated standard mass spectra of identified volatile compounds present for each sample? ✓

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the Data Assessment. If spectra are missing, contact the lab for missing spectra.

10.5 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration? ✓

10.6 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? ✓

10.7 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum? ✓

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected ("R"), flagged ("N") - Presumptive evidence of the presence of the compound) or changed to non detected ("U") at the calculated detection limit. In order to be

YES NO N/A

positively identified, the data must comply with the criteria listed in 9.6, 9.7, and 9.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

No TICs

11.0 Tentatively Identified Compounds (TIC) (CLP Form I/TIC Equivalent)

11.1 If Tentatively Identified Compound were required for this project, are all Tentatively Identified Compound reporting forms present; and do listed TICs include scan number or retention time, estimated concentration and a qualifier? [ ] ___ ✓

NOTE: Add "N" qualifier to all TICs which have CAS number, if missing.

NOTE: Have the project officer/appropriate official check the project plan to determine if lab was required to identify non-target analytes (SW-846, page 8260B-23, Sect. 7.6.2).

11.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:

a. Samples and/or fractions as appropriate [ ] ___ ✓

b. Blanks [ ] ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by a CAS#.

NOTE: If TICs are present in the associated blanks take action as specified in section 3.2 above.

YES NO N/A

11.3 Are any priority pollutants listed as TIC compounds (i.e., an BNA compound listed as a VOA TIC)? [ ] ___ ✓

ACTION: 1. Flag with "R" any target compound listed as a TIC.

2. Make sure all rejected compounds are properly reported if they are target compounds.

11.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [ ] ___ ✓

11.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%? [ ] ___ ✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate. Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R". (Common lab contaminants: CO_2(M/E 44), Siloxanes (M/E 73), Hexane, Aldol Condensation Products, Solvent Preservatives, and related byproducts).

12.0 Compound Quantitation and Reported Detection Limits

12.1 Are there any transcription/calculation errors in organic analysis reporting form results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and average initial RRF/CF were used to calculate organic analysis reporting form result. Were any errors found? [ ] ✓ ___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be

YES NO N/A

reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

12.2 Are the method CRQL's adjusted to reflect sample dilutions and, for soils, sample moisture? ✓ ___ ___

ACTION: If errors are large, take action as specified in section 3.2 above.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC accedence dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original reporting form (if present) and substituting the data from the analysis of the diluted sample. Specify which organic analysis reporting form is to be used, then draw a red "X" across the entire page of all reporting forms that should not be used, including any in the summary package.

13.0 Standards Data (GC/MS)

13.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant Reports) present for initial and continuing calibration? ✓ ___ ___

ACTION: If any calibration standard data are missing, take action specified in section 3.2 above.

14.0 GC/MS Initial Calibration (CLP Form VI Equivalent)

YES NO N/A

14.1 Are the Initial Calibration reporting forms present and complete for the volatile fraction? [✓] ___ ___

ACTION: If any calibration forms or standard raw data are missing, take action specified in section 3.2 above.

ACTION: If the percent relative standard deviation (% RSD) is > 20%, (8000C-39)qualify positive results for that analyte "J". When % RSD > 90%,. Qualify all positive results for that analyte "J" and all non-detects results for that analyte "R".

14.2 Are all average RRFs > 0.050? [ ] ✓ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list. If individual RRF values reported are below the listed values document in the Data Assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with red pencil.

ACTION: For any target analyte with average RRF < 0.05, or for the requirements for the 5 compounds in 14.2 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

14.3 Are response factors stable over the concentration range of the calibration. [✓] ___ ___

NOTE: (Method Requirement) For the following CCC compounds, the %RSD values must be ≤ 30.0%. If %RSD values reported are > 30.0% document in the Data Assessment.

YES NO N/A

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

ACTION: Circle all outliers with a red pencil.

ACTION: If the % RSD is > 20.0%, or > 30% for the 6 compounds in 14.3 above, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

14.4 Was the % RSD determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the linearity of the initial calibration? Document any effects to the case in the Data Assessment.

14.5 Are there any transcription/calculation errors in the reporting of RRF or % RSD? (Check at least two values but if errors are found, check more.) [ ] ✓ ___

ACTION: Circle errors with a red pencil.

ACTION: If errors are large, take action as specified in section 3.2 above.

15.0 GC/MS Calibration Verification (CLP Form VII Equivalent)

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA23761	Instrument:	OVGCMS3
		Calibration:	1304028

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA23761-TUN1	3DD001.D	04/09/13 07:52
Initial Cal Blank	AA23761-ICB1	3DD002.D	04/09/13 08:22
Cal Standard	AA23761-CAL3	3DD005.D	04/09/13 10:57
Cal Standard	AA23761-CAL4	3DD006.D	04/09/13 11:35
Cal Standard	AA23761-CAL5	3DD007.D	04/09/13 12:05
Cal Standard	AA23761-CAL6	3DD008.D	04/09/13 12:35
Cal Standard	AA23761-CAL7	3DD009.D	04/09/13 13:15
Cal Standard	AA23761-CAL2	3DD012.D	04/09/13 15:17
Cal Standard	AA23761-CAL1	3DD013.D	04/09/13 16:11
Secondary Cal Check	AA23761-SCV1	3DD015.D	04/09/13 17:11
Secondary Cal Check	AA23761-SCV2	3DD016.D	04/09/13 17:41

INITIAL CALIBRATION DATA (Continued)

EPA 8260B

Laboratory: ENCO Orlando

SDG: A302870-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Calibration: 1304028

Instrument: OVGCMS3

Matrix: Water

Calibration Date: 04/09/13 12:32

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Dichlorodifluoromethane	1.045137	9.352221	4.963333	0.1039146			15	
Chloromethane	1.452689	11.06914	5.516667	9.312013E-02			SPCC (0.1)	
Vinyl chloride	1.020702	9.178679	5.758334	6.701462E-02			CCC (30)	
Bromomethane	0.4083474	9.871646	6.561667	6.314456E-02			15	
Chloroethane	0.4588251	7.830256	6.836	0.2844984			15	
Trichlorofluoromethane	1.037116	6.81401	7.121667	0.1643185			15	
Freon 113	0.6347338	14.18108	8.096667	0.1025793			15	
Acetone	0.2386982	14.93262	9.035	0.0574048			15	
1,1-Dichloroethene	0.4766797	11.93991	8.066667	0.1012719			CCC (30)	
Carbon disulfide	2.19121	12.62861	8.153333	6.094817E-02			15	
Methylene Chloride	0.8494747	9.791554	8.966667	5.956773E-02			15	
Methyl-tert-Butyl Ether	1.237679	10.64301	9.306667	5.750991E-02			15	
trans-1,2-Dichloroethene	0.7685398	11.74591	9.188333	4.565442E-02			15	
cis-1,2-Dichloroethene	0.7417976	9.613822	10.615	5.201376E-02			15	
1,1-Dichloroethane	1.513364	13.23991	9.998333	7.496301E-02			SPCC (0.1)	
2-Butanone	4.396173E-02	9.342482	11.19833	6.608805E-02	JR		15	
Chloroform	1.402463	13.48206	10.88167	4.060685E-02			CCC (30)	
Bromochloromethane	0.3400808	11.51802	10.845	5.034445E-02			15	
1,1,1-Trichloroethane	0.9983739	9.850187	11.14667	4.894411E-02			15	
Methyl acetate	0.0853104	8.639185	9.178333	8.186206E-02			15	
Cyclohexane	1.39921	13.9509	10.85667	4.714439E-02			15	
Methyl cyclohexane	0.798159	11.89129	12.08167	2.693545E-02			15	
Carbon Tetrachloride	0.4837738	9.638003	11.075	4.711337E-02			15	
1,2-Dichloroethane	0.6051964	8.466085	11.72667	5.018619E-02			15	
Benzene	1.740088	11.51781	11.52333	3.724768E-02			15	
Trichloroethene	0.379863	4.706333	12.07167	3.040346E-02			15	
1,2-Dichloropropane	0.4922404	11.82531	12.59167	3.103671E-02			CCC (30)	
Bromodichloromethane	0.5709082	9.471192	12.61167	2.714976E-02			15	
4-Methyl-2-pentanone	3.096077E-02	11.89777	13.67429	7.079945E-02	JR		15	
2-Hexanone	0.2386703	12.96292	14.38714	3.691063E-02			15	
cis-1,3-Dichloropropene	0.6473497	14.8153	13.18167	0.0252442			15	
Toluene	1.148689	6.382588	13.39333	3.931257E-02			CCC (30)	

INITIAL CALIBRATION DATA (Continued)

EPA 8260B

Laboratory: ENCO Orlando

SDG: A302870-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Calibration: 1304028

Instrument: OVGCMS3

Matrix: Water

Calibration Date: 04/09/13 12:32

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
trans-1,3-Dichloropropene	0.5790786	13.40691	13.73333	4.198359E-02			15	
1,1,2-Trichloroethane	0.3784046	12.94258	13.89667	3.938419E-02			15	
Tetrachloroethene	0.3671155	7.951935	13.75667	3.424653E-02			15	
Dibromochloromethane	0.3921035	12.27866	14.08667	3.823486E-02			15	
1,2-Dibromoethane	0.3416361	5.581962	14.34833	3.245463E-02			15	
Chlorobenzene	1.227335	11.68599	14.78	1.210796E-02			SPCC (0.3)	
Ethylbenzene	0.5285616	11.76174	14.73667	0.0347469			CCC (30)	
m,p-Xylenes	0.7123413	8.756345	14.855	3.720799E-02			15	
o-Xylene	0.6615623	12.05617	15.27833	2.784823E-02			15	
Bromoform	0.2399217	13.34164	15.43333	3.579741E-02			SPCC (0.1)	
Styrene	1.072471	14.53876	15.32167	2.787352E-02			15	
Isopropylbenzene	1.710677	10.63016	15.55333	3.394314E-02			15	
1,1,2,2-Tetrachloroethane	0.4673375	9.30072	16.03333	0.019101			SPCC (0.3)	
1,2,4-Trichlorobenzene	1.08187	12.86485	20.16333	4.233861E-02			15	
1,3-Dichlorobenzene	1.835363	10.35498	17.075	3.532443E-02			15	
1,4-Dichlorobenzene	1.862128	9.840238	17.17167	2.003261E-02			15	
1,2-Dichlorobenzene	1.686558	14.14791	17.74667	2.651544E-02			15	
1,2-Dibromo-3-chloropropane	0.1220866	8.640953	18.93667	5.518876E-02			15	
1,2,3-Trichlorobenzene	0.8765956	13.63765	21.345	3.763256E-02			15	
Dibromofluoromethane	0.6806788	8.520567	11.085	4.923857E-02			15	
Toluene-d8	1.177503	4.565039	13.34667	3.230521E-02			15	
4-Bromofluorobenzene	0.5738038	10.83719	15.9	1.625923E-02			15	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24312	Instrument:	OVGCMS3
		Calibration:	1304028

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA24312-TUN1	3ES001.D	05/24/13 13:37
Calibration Check	AA24312-CCV1	3ES002.D	05/24/13 14:07
LCS	3E24030-BS1	3ES003.D	05/24/13 14:44
LCS Dup	3E24030-BSD1	3ES004.D	05/24/13 15:14
Blank	3E24030-BLK1	3ES005.D	05/24/13 15:44
VENO-EB01-051713-SD	A302870-11	3ES006.D	05/24/13 16:14
VENO-TB01-051713-SD	A302870-12	3ES007.D	05/24/13 16:44

CONTINUING CALIBRATION CHECK

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OVGCMS3	Calibration:	1304028
Lab File ID:	3ES002.D	Calibration Date:	04/09/13 12:32
Sequence:	AA24312	Injection Date:	05/24/13
Lab Sample ID:	AA24312-CCV1	Injection Time:	14:07

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Dichlorodifluoromethane	A	50.0	55	1.045137	1.146164		9.7	20
Chloromethane	A	50.0	42	1.452689	1.233454	0.1	-15.1	20
Vinyl chloride	A	50.0	45	1.020702	0.9143115		-10.4	20
Bromomethane	A	50.0	40	0.4083474	0.3304848		-19.1	20
Chloroethane	A	50.0	45	0.4588251	0.3921271		-14.5	20
Trichlorofluoromethane	A	50.0	52	1.037116	1.088123		4.9	20
Freon 113	A	50.0	44	0.6347338	0.559993		-11.8	20
Acetone	A	50.0	44	0.2386982	0.2111165		-11.6	20
1,1-Dichloroethene	A	50.0	41	0.4766797	0.3863465		-19.0	20
Carbon disulfide	A	50.0	44	2.19121	1.929125		-12.0	20
Methylene Chloride	A	50.0	42	0.8494747	0.7069091		-16.8	20
Methyl-tert-Butyl Ether	A	50.0	42	1.237679	1.038692		-16.1	20
trans-1,2-Dichloroethene	A	50.0	44	0.7685398	0.6783577		-11.7	20
cis-1,2-Dichloroethene	A	50.0	47	0.7417976	0.697552		-6.0	20
1,1-Dichloroethane	A	50.0	44	1.513364	1.332675	0.1	-11.9	20
2-Butanone	A	50.0	47	4.396173E-02	4.102025E-02	JR	-6.7	20
Chloroform	A	50.0	52	1.402463	1.468953		4.7	20
Bromochloromethane	A	50.0	46	0.3400808	0.3153896		-7.3	20
1,1,1-Trichloroethane	A	50.0	58	0.9983739	1.166262		16.8	20
Methyl acetate	A	50.0	41	0.0853104	7.016849E-02		-17.7	20
Cyclohexane	A	50.0	42	1.39921	1.188209		-15.1	20
Methyl cyclohexane	A	50.0	42	0.798159	0.6665545		-16.5	20
Carbon Tetrachloride	A	50.0	51	0.4837738	0.4977817		2.9	20
1,2-Dichloroethane	A	50.0	57	0.6051964	0.6841946		13.1	20
Benzene	A	50.0	45	1.740088	1.577712		-9.3	20
Trichloroethene	A	50.0	53	0.379863	0.4036727		6.3	20
1,2-Dichloropropane	A	50.0	43	0.4922404	0.4248276		-13.7	20
Bromodichloromethane	A	50.0	56	0.5709082	0.6392035		12.0	20
4-Methyl-2-pentanone	A	50.0	49	3.096077E-02	3.026206E-02	JR	-2.3	20

CONTINUING CALIBRATION CHECK

EPA 8260B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OVGCMS3	Calibration:	1304028
Lab File ID:	3ES002.D	Calibration Date:	04/09/13 12:32
Sequence:	AA24312	Injection Date:	05/24/13
Lab Sample ID:	AA24312-CCV1	Injection Time:	14:07

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
2-Hexanone	A	50.0	43	0.2386703	0.2059449		-13.7	20
cis-1,3-Dichloropropene	A	50.0	57	0.6473497	0.7394618		14.2	20
Toluene	A	50.0	49	1.148689	1.126352		-1.9	20
trans-1,3-Dichloropropene	A	50.0	56	0.5790786	0.6486432		12.0	20
1,1,2-Trichloroethane	A	50.0	48	0.3784046	0.3618343		-4.4	20
Tetrachloroethene	A	50.0	52	0.3671155	0.378106		3.0	20
Dibromochloromethane	A	50.0	55	0.3921035	0.427439		9.0	20
1,2-Dibromoethane	A	50.0	57	0.3416361	0.388343		13.7	20
Chlorobenzene	A	50.0	51	1.227335	1.252224	0.3	2.0	20
Ethylbenzene	A	50.0	57	0.5285616	0.6035615		14.2	20
m,p-Xylenes	A	100	110	0.7123413	0.7881631		10.6	20
o-Xylene	A	50.0	53	0.6615623	0.7009922		6.0	20
Bromoform	A	50.0	53	0.2399217	0.2534963	0.1	5.7	20
Styrene	A	50.0	58	1.072471	1.254862		17.0	20
Isopropylbenzene	A	50.0	58	1.710677	1.993927		16.6	20
1,1,2,2-Tetrachloroethane	A	50.0	53	0.4673375	0.4974221	0.3	6.4	20
1,2,4-Trichlorobenzene	A	50.0	51	1.08187	1.108237		2.4	20
1,3-Dichlorobenzene	A	50.0	47	1.835363	1.738657		-5.3	20
1,4-Dichlorobenzene	A	50.0	47	1.862128	1.734487		-6.9	20
1,2-Dichlorobenzene	A	50.0	47	1.686558	1.589484		-5.8	20
1,2-Dibromo-3-chloropropane	A	50.0	56	0.1220866	0.1363799		11.7	20
1,2,3-Trichlorobenzene	A	50.0	56	0.8765956	0.9822859		12.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

YES NO N/A

15.1 Are the Calibration Verification reporting forms present and complete for all compounds of interest? [✓] ___ ___

15.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument? [✓] ___ ___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

_____

ACTION: If any forms are missing or no calibration verification standard has been analyzed twelve hours prior to sample analysis, take action as specified in section 3.2 above. If calibration verification data are not available, flag all associated sample data as unusable ("R").

15.3 Was the % D determined from the calibration verification determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the calibration verification? Document any effects to the case in the Data Assessment.

15.4 Do any volatile compounds have a % D (difference or drift) between the initial and continuing RRF or CF which exceeds 20% (SW-846, page 8260B-19, section 7.4.5.2). [ ] [✓] ___

NOTE: (Method Requirement) For the following CCC compounds, the %D values must be ≤ 20.0%. If %D values reported are > 20.0% document in the Data Assessment.

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

YES NO N/A

ACTION: Circle all outliers with a red pencil.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated, "J". When %D is above 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

15.5 Do any volatile compounds have a RRF < 0.05? [✓] ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list for each calibration verification. If average RRF values reported are below the listed values document in the data assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with a red pencil.

ACTION: If RRF < 0.05, or < the requirements for the 5 compounds is section 15.5 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

16.0 Internal Standards (CLP Form VIII Equivalent)

16.1 Are the internal standard (IS) areas on the internal standard reporting forms of every sample and blank within the upper and lower limits (-50% to + 100%) for each initial mid-point calibration (SW-846, 8260B-20, Sect. 7.4.7)? [✓] ___ ___

YES NO N/A

ACTION: If errors are large or information is missing, take action as specified in section 3.2 above.

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area Lower Limit	Area Upper Limit

(Attach additional sheets if necessary.)

ACTION:
1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.
2. Do not qualify non-detects when the associated IS are counts area > + 100%.
3. If the IS area is below the lower limit (< -50%), qualify all associated non-detects (U-values) "J".
4. If extremely low area counts are reported (< -25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable "R" and positive results as estimated "J".

16.2 Are the retention times of all internal standards within 30 seconds of the associated initial mid-point calibration standard (SW-846, 8260B-20, Sect. 7.4.6)? [✓] ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

YES NO N/A

17.0 Field Duplicates

17.1 Were any field duplicates submitted for volatile analysis? ✓ ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the Data Assessment. However, if large differences exist, take action specified in section 3.2 above.

VEN0-SD07-000H
VEN0-SD07P-000H
> no ⓔ above LOD, no qual

Initial Calibration Date: 4/9/2013

RRF and %RSD Calculations:

Compound Name: vinyl chloride
Lab Value: 1.1150

Area of Compound	1542465
Area of Internal STD	1383393
Conc. of Internal STD	50
Conc. of Compound	50
Calculated RRF	1.1150

Compound Name: trichloroethene
Lab Value: 4.71

RRF of STD 1	0.3823
RRF of STD 2	0.3544
RRF of STD 3	0.4035
RRF of STD 4	0.3957
RRF of STD 5	0.3721
RRF of STD 6	0.3712
Calculated % RSD	4.71

Continuing Calibration File ID: 5/24/2013

RRF and %D Calculations:

Compound Name: cis-1,2-dichloroethene
Lab Value: 0.698

Area of Compound	1034282
Area of Internal STD	1482731
Conc. of Internal STD	50
Conc. of Compound	50
Calculated RRF	0.698

Compound Name: tetrachloroethene
Lab Value: 3.0

Average RRF	0.367
Calibration Check RRF	0.378
Calculated % D	-3.0

DataQual

From: Marcia Colon <mcolon@encolabs.com>
Sent: Wednesday, July 03, 2013 2:00 PM
To: 'DataQual'
Cc: Juliana.Dean@ch2m.com; 'Michael Zamboni'; 'Jacqueline Cleveland'
Subject: RE: CTO-037 La Chiva VOA fraction

Hi Laura-These samples were not rerun for the low 4-BFB. The other 2 surrogates were within acceptable limits and since the 4-BFB only failed minimally the analyst did not rerun. The soils were problematic for SVOC and pesticide and thus the analyst feels that the low 4-BFB recovery could be attributed to the matrix interference.

Let me know if you need more information, I'll be out Friday but back Monday.

Happy 4th!!
Marcia

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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ENCO is an eco-friendly lab offering paperless service options, please contact me anytime with questions.

From: DataQual [mailto:dataqual@charter.net]
Sent: Wednesday, July 03, 2013 12:38 PM
To: Marcia Colon
Cc: Juliana.Dean@ch2m.com; Michael Zamboni; Jacqueline Cleveland
Subject: CTO-037 La Chiva VOA fraction

Hi Marcia,

The following questions are for project CTO-037 East Vieques La Chiva concerning the **VOA fraction** data packages.

SDG# A302870

- Sample VENO-SD04-000H (A302870-05) exhibited a low surrogate recovery. I am not finding that the sample was re-analyzed. Please check if the sample was re-analyzed and if so please provide the sample analysis and all associated forms.

SDG# A302428

- Sample VENO-SD02-0H01 (A302428-13) exhibited a low surrogate recovery. I am not finding that the sample was re-analyzed. Please check if the sample was re-analyzed and if so please provide the sample analysis and all associated forms.

SDG# A302857

- Samples VENO-SD11-0H01 (A302857-01) and VENO-SD09-000H (A302857-05exhibited a low surrogate recovery. I am not finding that these samples were re-analyzed. Please check if the samples were re-analyzed and if so please provide the sample analyses and all associated forms.

If there are any questions concerning these issues please feel free to contact me.

Thank you,
Laura

Laura Maschhoff
DataQual Environmental Services, LLC
dataqual@charter.net
314-330-1327

YES NO N/A

E - The concentration of this analyte exceeds the calibration range of the instrument.

A - Indicates a Tentatively Identified Compound (TIC) is a suspected adol-condensation product.

X,Y,Z- Laboratory defined flags. The data reviewer must change these qualifiers during validation so that the data user may understand their impact on the data.

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: A302870 LAB: ENCO

SITE NAME: East Vieques La Chiva SWMU 1

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format? ✓ ___ ___

ACTION: If not, note the effect on review of the data in the data assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative or cover letter present? ✓ ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? ✓ ___ ___

YES NO N/A

II. SEMIVOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Report Forms present for all samples? [✓] ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? [✓] [ ] ___

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, all non-detects data are qualified as unusable (R), and detects are flagged "J".

All attached form

ACTION: If samples were not iced, or if the ice was melted upon arrival at the laboratory and the cooler temperature was elevated (10°C), flag all positive results "J" and all non-detects "UJ".

2°C temp

2.0 Holding Times

2.1 Have any semivolatile technical holding times, determined from date of collection to date of extraction, been exceeded? [✓] [ ] ___

Continuous extraction of water samples for semivolatile analysis must be started within **7** days of the date of collection. Soil/sediment samples must be extracted within **14** days of collection. Extracts must be analyzed within

All attached form

YES NO N/A

40 days of the date of extraction.

Table of Holding Time Violations

Sample ID	Sample Matrix	Date Sampled	Date Lab Received	(See Traffic Report) Date Extracted	Date Analyzed
	See attached form				

ACTION: If technical holding times are exceeded, flag all positive results as estimated ("J") and sample quantitation limits as estimated ("UJ"), and document in the narrative that holding times were exceeded.

If analyses were done more than 14 days beyond holding time, either on the first analysis or upon re analysis, the reviewer must use professional judgement to determine the reliability of the data and the effects of additional storage on the sample results. At a minimum, all results should be qualified "J", but the reviewer may determine that non-detect data are unusable ("R"). If holding times are exceeded by more than 28 days, all non-detect data are unusable (R).

HOLDING TIME SUMMARY

EPA 8270D

Laboratory: ENCO Orlando

SDG: A302870-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
VENO-SD04-000H	05/17/13 08:35	05/18/13 09:25	05/22/13 09:00	5.00	14.00	06/03/13 18:51	12.00	40.00	
VENO-SD04-000H	05/17/13 08:35	05/18/13 09:25	06/07/13 09:45	21.00	14.00	06/10/13 19:01	3.00	40.00	*
VENO-SD04-0H01	05/17/13 08:20	05/18/13 09:25	05/22/13 09:00	5.00	14.00	06/03/13 19:20	12.00	40.00	
VENO-SD05-000H	05/17/13 09:10	05/18/13 09:25	05/22/13 09:00	5.00	14.00	06/03/13 19:48	12.00	40.00	
VENO-SD06-000H	05/17/13 09:35	05/18/13 09:25	05/22/13 09:00	5.00	14.00	06/03/13 20:17	12.00	40.00	
VENO-SD07-000H	05/17/13 10:15	05/18/13 09:25	05/22/13 09:00	5.00	14.00	06/03/13 20:45	12.00	40.00	
VENO-SD07P-000H	05/17/13 10:15	05/18/13 09:25	05/22/13 09:00	5.00	14.00	06/03/13 21:13	12.00	40.00	
VENO-EB01-051713-SD	05/17/13 07:00	05/18/13 09:25	05/22/13 01:30	5.00	7.00	06/05/13 15:03	14.00	40.00	

JNS

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 302870

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	% Moisture
VENO-SD04-000H	76.15
VENO-SD04-0H01	68.45
VENO-SD05-000H	72.18
VENO-SD06-000H	63.09

	YES	NO	N/A
3.0 Surrogate Recovery (Form II/Equivalent)			
3.1 Have the semi volatile surrogate recoveries been listed on CLP Surrogate Recovery forms (Form II) for each of the following matrices:			
a. Low Water	✓		
b. Low/Med Soil	✓		
3.2 If so, are all the samples listed on the appropriate Surrogate Recovery Summary forms for each matrix:			
a. Low Water	✓		
b. Low/Med Soil	✓		
ACTION: If CLP deliverables are unavailable, document the effect(s) in data assessments. In some cases the lab may have to be contacted to obtain the data necessary to complete the validation.			
3.3 Were outliers marked correctly with an asterisk?	✓		
ACTION: Circle all outliers in red.			
3.4 Were two or more base neutral OR acid surrogate recoveries out of specification for any sample or method blank (Reviewer should use lab in house recovery limits. Use surrogate recovery limits from USEPA National Functional Guidlines January 2005 page 130, if in house limits are not available. See Method 8000B-43 or 80000C-24).	✓		
Note: Examine lab in house limits for reasonableness.			
If yes, were samples re-analyzed?	✓		

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8270D

Laboratory: ENCO Orlando
SDG: A302870-CTO0037
Client: CH2M Hill, Inc. (CH029)
Project: East Vieques La Chiva SWMU 1, CTO-0037

Sequence: AA24398
Instrument: OSVGCMS1
Matrix: Soil
Calibration: 1304084

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (3E22007-MSD1)			Lab File ID: 1f3008.D		Analyzed: 06/03/13 12:39			
2-Fluorophenol	3.54	64	35 - 105	5.327	5.3845	-0.0575	+/-0.5	
Phenol-d5	3.54	64	40 - 100	6.406	6.4685	-0.0625	+/-0.5	
Nitrobenzene-d5	3.54	69	35 - 100	7.546	7.626	-0.0800	+/-0.5	
2-Fluorobiphenyl	3.54	63	45 - 105	9.775	9.8535	-0.0785	+/-0.5	
2,4,6-Tribromophenol	3.54	79	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	3.54	91	30 - 125	14.5	14.57375	-0.0738	+/-0.5	
VENO-SD04-000H (A302870-05)			Lab File ID: 1f3021.D		Analyzed: 06/03/13 18:51			
2-Fluorophenol	6.94	19	35 - 105	5.317	5.3845	-0.0675	+/-0.5	*
Phenol-d5	6.94	21	40 - 100	6.396	6.4685	-0.0725	+/-0.5	*
Nitrobenzene-d5	6.94	12	35 - 100	7.536	7.626	-0.0900	+/-0.5	*
2-Fluorobiphenyl	6.94		45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	6.94	8	35 - 125	11.644	11.72025	-0.0762	+/-0.5	*
Terphenyl-d14	6.94	11	30 - 125	14.5	14.57375	-0.0738	+/-0.5	*
VENO-SD04-0H01 (A302870-06)			Lab File ID: 1f3022.D		Analyzed: 06/03/13 19:20			
2-Fluorophenol	5.23	20	35 - 105	5.307	5.3845	-0.0775	+/-0.5	*
Phenol-d5	5.23	24	40 - 100	6.396	6.4685	-0.0725	+/-0.5	*
Nitrobenzene-d5	5.23	13	35 - 100	7.536	7.626	-0.0900	+/-0.5	*
2-Fluorobiphenyl	5.23		45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	5.23	7	35 - 125	11.644	11.72025	-0.0762	+/-0.5	*
Terphenyl-d14	5.23	9	30 - 125	14.5	14.57375	-0.0738	+/-0.5	*
VENO-SD05-000H (A302870-07)			Lab File ID: 1f3023.D		Analyzed: 06/03/13 19:48			
2-Fluorophenol	5.97	17	35 - 105	5.307	5.3845	-0.0775	+/-0.5	*
Phenol-d5	5.97	20	40 - 100	6.396	6.4685	-0.0725	+/-0.5	*
Nitrobenzene-d5	5.97	9	35 - 100	7.536	7.626	-0.0900	+/-0.5	*
2-Fluorobiphenyl	5.97		45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	5.97	4	35 - 125	11.644	11.72025	-0.0762	+/-0.5	*
Terphenyl-d14	5.97	6	30 - 125	14.49	14.57375	-0.0838	+/-0.5	*
VENO-SD06-000H (A302870-08)			Lab File ID: 1f3024.D		Analyzed: 06/03/13 20:17			
2-Fluorophenol	4.47	17	35 - 105	5.307	5.3845	-0.0775	+/-0.5	*
Phenol-d5	4.47	20	40 - 100	6.396	6.4685	-0.0725	+/-0.5	*
Nitrobenzene-d5	4.47	10	35 - 100	7.536	7.626	-0.0900	+/-0.5	*
2-Fluorobiphenyl	4.47		45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	4.47	4	35 - 125	11.634	11.72025	-0.0862	+/-0.5	*
Terphenyl-d14	4.47	7	30 - 125	14.49	14.57375	-0.0838	+/-0.5	*

* J/R all

J/R all

J/R all

J/R all

* Sample not used in favor of RE

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24398	Instrument:	OSVGCMS1
Matrix:	Soil	Calibration:	1304084

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
VENO-SD07-000H (A302870-09)			Lab File ID: 1f3025.D		Analyzed: 06/03/13 20:45			
2-Fluorophenol	2.19	72	35 - 105	5.317	5.3845	-0.0675	+/-0.5	
Phenol-d5	2.19	76	40 - 100	6.396	6.4685	-0.0725	+/-0.5	
Nitrobenzene-d5	2.19	67	35 - 100	7.546	7.626	-0.0800	+/-0.5	
2-Fluorobiphenyl	2.19	47	45 - 105	9.775	9.8535	-0.0785	+/-0.5	
2,4,6-Tribromophenol	2.19	61	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	2.19	54	30 - 125	14.5	14.57375	-0.0738	+/-0.5	
VENO-SD07P-000H (A302870-10)			Lab File ID: 1f3026.D		Analyzed: 06/03/13 21:13			
2-Fluorophenol	2.16	84	35 - 105	5.327	5.3845	-0.0575	+/-0.5	
Phenol-d5	2.16	89	40 - 100	6.396	6.4685	-0.0725	+/-0.5	
Nitrobenzene-d5	2.16	76	35 - 100	7.546	7.626	-0.0800	+/-0.5	
2-Fluorobiphenyl	2.16	39	45 - 105	9.775	9.8535	-0.0785	+/-0.5	*
2,4,6-Tribromophenol	2.16	70	35 - 125	11.644	11.72025	-0.0762	+/-0.5	
Terphenyl-d14	2.16	72	30 - 125	14.5	14.57375	-0.0738	+/-0.5	

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SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24468	Instrument:	OSVGCMS1
Matrix:	Soil	Calibration:	1304084

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
VENO-SD04-000H (A302870-05RE1)			Lab File ID: 1fe018.D		Analyzed: 06/10/13 19:01			
2-Fluorophenol	6.99	31	35 - 105	5.217	5.3845	-0.1675	+/-0.5	*
Phenol-d5	6.99	37	40 - 100	6.316	6.4685	-0.1525	+/-0.5	*
Nitrobenzene-d5	6.99	23	35 - 100	7.446	7.626	-0.1800	+/-0.5	*
2-Fluorobiphenyl	6.99	4	45 - 105	9.691	9.8535	-0.1625	+/-0.5	*
2,4,6-Tribromophenol	6.99	16	35 - 125	11.543	11.72025	-0.1773	+/-0.5	*
Terphenyl-d14	6.99	7	30 - 125	14.399	14.57375	-0.1748	+/-0.5	*

JWJ acid
JR B/N

	YES	NO	N/A
Were method blanks re-analyzed?	✓		

ACTION: If all surrogate recoveries are > 10% but two within the base-neutral or acid fraction do not meet method specifications, <u>for the affected fraction only (i.e. either base-neutral or acid compounds):</u>

1. Flag all positive results as estimated ("J").

2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.

3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects.

If any base-neutral <u>or</u> acid surrogate has a recovery of < 10%:

1. Positive results for the fraction with < 10% surrogate recovery are qualified with "J".

2. Non-detects for that fraction should be qualified as unusable (R) .

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. Check the internal standard areas.

3.5 Are there any transcription/calculation errors between raw data and Form II?		✓	

ACTION: If large errors exist, call lab for explanation/resubmittal, make any necessary corrections and document

YES NO N/A

effect in data assessments.

MS/MSD not assoc. w/ sample in this SDG

4.0 Matrix Spikes (Form III/Equivalent)

4.1 Have the semivolatile Matrix Spike and Matrix Spike Duplicate/or duplicate unspiked Sample recoveries been listed on the Recovery Form (Form III)? [ ] ___ ✓

NOTE: Method 3500B/page 4 states the spiking compounds:

Base/neutrals	Acids
1,2,4-Trichlorobenzene	Pentachlorophenol
Acenaphthene	Phenol
2,4-Dinitrotoluene	2-Chlorophenol
Pyrene	4-Chloro-3-methylphenol
N-Nitroso-di-n-propylamine	4-Nitrophenol
1,4-Dichlorobenzene	

Note: Some projects may require the spiking of specific compounds of interest.

Note: See Method 8270D-sec 8.4.2 for deciding on whether to prepare and analyze duplicate samples or a martix spike/matrix spike duplicate. If samples are expected to contain target analytes, then laboratory may use one matrix spike and a duplicate analysis of an unspiked field sample. If samples are not expected to contain target analytes, laboratory should use a matrix spike and matrix spike duplicate pair.

4.2 Were matrix spikes analyzed at the required frequency for each of the following matrices:

a. Low Water [ ] ___ ✓

b. Low Solid [ ] ___ ✓

c. Med Solid [ ] ___ ✓

YES NO N/A

ACTION: If any matrix spike data are missing, take the action specified in 3.2 above. It may be necessary to contact the lab to obtain the required data.

NOTE: If the data has not been reported on CLP equivalent form, then the laboratory must provide the information necessary to evaluate the spike recoveries in the MS and MSD. The required data which should have been provided by the lab include the analytes and concentrations used for spiking, background concentrations of the spiked analytes (i.e., concentrations in unspiked sample), methods and equations used to calculate the QC acceptance criteria for the spiked analytes, percent recovery data for all spiked analytes.

The data reviewer must verify that all reported equations and percent recoveries are correct before proceeding to the next section.

4.3 Were matrix spikes performed at concentration equal to 100ug/L for acid compounds, and 200ug/l for base compounds (Method 3500B-4), or those specified in project plan. [ ] ___ ✓

4.4 How many semivolatile spike recoveries are outside Laboratory in house MS/MSD recovery limits (use recovery limits values in Method 8270D-43&44 Table 6 if in house values not available).

Water	Solids
____ out of ____	____ out of ____

YES NO N/A

4.5 How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?

Water

____ out of ____

Solids

____ out of ____

ACTION: Circle all outliers with red pencil.

ACTION: No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the matrix spike and matrix spike duplicate results in conjunction with other QC criteria to determine the need for some qualification of the data.

4.6 Was a Laboratory Control Sample (LCS) analyzed with each analytical batch? [✓] ___ ___

NOTE: When the results of the matrix spike analysis indicate a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

5.0 Blanks (Form IV/Equivalent)

5.1 Is the Method Blank Summary (Form IV) present? [✓] ___ ___

5.2 Frequency of Analysis:

Has a reagent/method blank analysis been reported per 20 samples of similar matrix, or concentration level, and for each extraction batch? [✓] ___ ___

5.3 Has a method blank been analyzed either after

	YES	NO	N/A
the calibration standard or at any other time during the analytical shift for each GC/MS system used ?	✓		

ACTION: If any method blank data are missing, call lab for explanation/resubmittal. If not available, use professional judgement to determine if the associated sample data should be qualified.

	YES	NO	N/A
5.4 Chromatography: review the blank raw data - chromatograms (RICs), quant reports or data system printouts and spectra.			
Is the chromatographic performance (baseline stability) for each instrument acceptable for the semivolatiles?	✓		

ACTION: Use professional judgement to determine the effect on the data.

6.0 Contamination

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

	YES	NO	N/A
6.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary.		✓	
6.2 Do any field/rinse/ blanks have positive results for target analytes and/or TICs (if required, see section 10 below)?		✓	

VEND-EB01-051713-SD

YES NO N/A

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case) must be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field Blanks must be qualified for outlying surrogates, poor spectra, instrument performance or calibration QC problems.

ACTION: Follow the directions in the table below to qualify sample results due to contamination. Use the largest value from all the associated blanks. If gross contamination exists, all data in the associated samples should be qualified as unusable (R).

YES NO N/A

Blank Action for Semivolatile Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Field	Detects	Not detected	No qualification required
	< CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	= CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification required
	> CRQL *	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report concentration of sample with a U
		≥ CRQL and ≥ blank contamination	No qualification required

NOTE: Analytes qualified "U" for blank contamination are still considered as "hits" when qualifying for calibration criteria.

NOTE: If the laboratory did not report TIC analyses, check the project plans to verify whether or not it was required.

6.3 Are there field/rinse/equipment blanks associated with every sample? ✓ ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

6.4 Was a instrument blank analyzed after each sample/dilution which contained a target compound

	YES	NO	N/A
that exceeded the initial calibration range.	[ ]		✓
6.5 Does the instrument blank have positive results for target analytes and/or TICs?		[ ]	✓

Note: Use professional judgement to determine if carryover occurred and qualify analytes accordingly.

7.0 GC/MS Apparatus and Materials

	YES	NO	N/A
7.1 Did the lab use the proper gas chromatographic column for analysis of semivolatiles by Method 8270D? Check raw data, instrument logs or contact the lab to determine what type of column was used. The method requires the use of 30 m x 0.25 mm ID (or 0.32 mm ID), silicone-coated, fused silica, capillary column.	✓ [ ]		

ACTION: If the specified column, or equivalent, was not used, document the effects in the data assessment. Use professional judgement to determine the acceptability of the data.

8.0 GC/MS Instrument Performance Check (Form V/Equivalent)

	YES	NO	N/A
8.1 Are the GC/MS Instrument Performance Check Forms (Form V) present for decafluorotriphenylphosphine (DFTPP)?	✓ [ ]		

NOTE: The performance solution should also contain 4,4-DDT, pentachlorophenol, and benzidine to verify injection port inertness and column performance. The degradation of DDT to DDE and DDD must be less than 20% total and the response of pentachlorophenol and benzidine should be within normal ranges for these compounds (based upon lab experience) and show no peak degradation or tailing before samples are analyzed. (see section 5.5

	YES	NO	N/A
page 8270D-12).			
8.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve hour shift?	✓		
8.3 Has an instrument performance check solution been analyzed for every twelve hours of sample analysis per instrument?	✓		

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS tuning data are available.

DATE	TIME	INSTRUMENT	SAMPLE NUMBERS

ACTION: If lab cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable (R).

	YES	NO	N/A
8.4 Have the ion abundances been normalized to m/z 198?	✓		
8.5 Have the ion abundance criteria been met for each instrument used?	✓		

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

	YES	NO	N/A
ACTION: If ion abundance criteria are not met, take action specified in section 3.2			
8.6 Are there any transcription/calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.)		✓	
8.7 Have the appropriate number of significant figures (two) been reported?	✓		
ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document effect in data assessments.			
8.8 Are the spectra of the mass calibration compound acceptable?	✓		
ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.			
9.0 Target Analytes			
9.1 Are the Organic Analysis Data Sheets (Form I) present with required header information on each page, for each of the following:			
a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates	✓		
c. Blanks	✓		
9.2 Has any special cleanup, such as GPC, been performed on all soil/sediment sample extracts (see section 7.2, page 8270D-14)?		✓	

	YES	NO	N/A
ACTION: If data suggests that extract cleanup was not performed, use professional judgement. Make note in the data assessment narrative.			
9.3 Are the Reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?			
a. Samples and/or fractions as appropriate	✓		
b. Matrix spikes and matrix spike duplicates (Mass spectra not required)	✓		
c. Blanks	✓		
ACTION: If any data are missing, take action specified in 3.2 above.			
9.4 Are the response factors shown in the Quant Report?	✓		
9.5 Is chromatographic performance acceptable with respect to:			
Baseline stability?	✓		
Resolution?	✓		
Peak shape?	✓		
Full-scale graph (attenuation)?	✓		
Other:_____			
ACTION: Use professional judgement to determine the acceptability of the data.			
9.6 Are the lab-generated standard mass spectra of identified semivolatile compounds present for			

	YES	NO	N/A
each sample?	✓		

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the data assessment narrative. If spectra are missing, reject all positive data.

9.7 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	✓		
9.8 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum?	✓		
9.9 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum?	✓		

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected (R), flagged "N" (Presumptive evidence of the presence of the compound) or changed to not detected (U) at the calculated detection limit. In order to be positively identified, the data must comply with the criteria listed in 9.7, 9.8, and 9.9.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

	YES	NO	N/A
10.0 Tentatively Identified Compounds (TIC)			
10.1 If Tentatively Identified Compounds were required for this project, are all Form Is, Part B present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier?			
NOTE: Review sampling reports to determine if the lab was required to identify non target analytes (refer to section 7.6.2,page 8270D-21).			
10.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:	[ ]	___	✓
a. Samples and/or fractions as appropriate	[ ]	___	✓
b. Blanks	[ ]	___	✓
ACTION: If any TIC data are missing, take action specified in 3.2 above.			
ACTION: Add "JN" qualifier only to analytes identified by CAS #.			
10.3 Are any target compounds from one fraction listed as TIC compounds in another (e.g., an acid compound listed as a base neutral TIC)?	___	[ ]	✓
ACTION: i. Flag with "R" any target compound listed as a TIC.			
ii. Make sure all rejected compounds are properly reported in the other fraction.			
10.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the			

No TICs

	YES	NO	N/A
sample mass spectrum?	[ ]	___	✓
10.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%?	[ ]	___	✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate and remove "JN". Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R."

11.0 Compound Quantitation and Reported Detection Limits

	YES	NO	N/A
11.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and RRF were used to calculate Form I result. Were any errors found?	___	✓	___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

	YES	NO	N/A
11.2 Are the method detection limits adjusted to reflect sample dilutions and, for soils, sample moisture?	✓	___	___

YES NO N/A

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC exceedance dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original Form I (if present) and substituting the data from the analysis of the diluted sample. Specify which Form I is to be used, then draw a red " X" across the entire page of all Form I's that should not be used, including any in the summary package.

12.0 Standards Data (GC/MS)

12.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant, Reports) present for initial and continuing calibration? [✓] ___ ___

ACTION: If any calibration standard data are missing, take action specified in 3.2 above.

13.0 GC/MS Initial Calibration (Form VI/Equivalent)

13.1 Is the Initial Calibration Form (Form VI/ Equivalent) present and complete for the semivolatile fraction? [✓] ___ ___

ACTION: If any calibration forms or standard row data are missing, take action specified in 3.2 above.

13.2 Are all base neutral or acid RRFs > 0.050? [✓] ___ ___

YES NO N/A

Check the **average RRFs** of the four System Performance Check Compounds (SPCCs): N-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, and 4-nitrophenol. These compounds must have **average RRFs** greater than or equal to 0.05 before running samples and should not show any peak tailing.

ACTION: Circle all outliers in red.

ACTION: For any target analyte with **average RRF <0.05**

1. "R" all non-detects;

2. "J" all positive results.

13.3 Are response factors for base neutral or acid target analytes stable over the concentration range of the calibration (% Relative standard deviation [%RSD] < 20.0%)? [ ] ✓ ___

NOTE: The % RSD for each individual Calibration Check Compound (CCC, Method 8270D-40 see Table 4) must be less than 30% before analysis can begin. If grater 30%, the lab must clean and recalibrate the instrument.

CALIBRATION CHECK COMPOUNDS

Base/Neutral Fraction	Acid Fraction
Acenaphthene	4-Chloro-3-methylphenol
1,4-Dichlorobenzene	2,4-Dichlorophenol
Hexachlorobutadiene	2-Nitrophenol
Diphenylamine	Phenol
Di-n-octyl phthalate	Pentachlorophenol
Fluoranthene	2,4,6-Trichlorophenol

YES NO N/A

Benzo(a)pyrene

ACTION: If the %RSD for any CCC >30% and no corrective action taken, then "J" qualify all positive hits and "UJ" qualify all non-detects.

ACTION: Circle all outliers in red.

ACTION: If the % RSD is ≥ 20.0%, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, flag all non- detect results for that analyte "R," unusable. Alternatively, the lab should calculate first or second order regression fit of the calibration curve and select the fit which introduces the least amount of error.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

13.4 Did the laboratory calculate the calibration curve by the least squares regression fit? ___ [✓] ___

13.5 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or % RSD? (Check at least two values but if errors are found, check more.) ___ [✓] ___

ACTION: Circle Errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and note errors in data assessments.

13.5 Do the target compounds for this SDG include Pesticides? [ ] [✓] ___

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA23913	Instrument:	OSVGCMS1
		Calibration:	1304084

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA23913-TUN1	1dr001.D	04/24/13 10:27
Cal Standard	AA23913-CAL6	1dr008.D	04/24/13 13:31
Cal Standard	AA23913-CAL7	1dr009.D	04/24/13 13:59
Cal Standard	AA23913-CAL8	1dr010.D	04/24/13 14:27
Cal Standard	AA23913-CAL9	1dr011.D	04/24/13 14:55
Cal Standard	AA23913-CALA	1dr012.D	04/24/13 15:23
Cal Standard	AA23913-CALB	1dr013.D	04/24/13 15:51
Secondary Cal Check	AA23913-SCV2	1dr014.D	04/24/13 16:20
Cal Standard	AA23913-CALC	1dr015.D	04/24/13 16:48
Cal Standard	AA23913-CALD	1dr016.D	04/24/13 17:16
Cal Standard	AA23913-CALE	1dr017.D	04/24/13 17:44
Cal Standard	AA23913-CALF	1dr018.D	04/24/13 18:12
Cal Standard	AA23913-CALG	1dr019.D	04/24/13 18:41
Cal Standard	AA23913-CALH	1dr020.D	04/24/13 19:09
Cal Standard	AA23913-CALI	1dr021.D	04/24/13 19:37
Cal Standard	AA23913-CALJ	1dr022.D	04/24/13 20:05
Secondary Cal Check	AA23913-SCV3	1dr023.D	04/24/13 20:33

INITIAL CALIBRATION DATA (Continued)

EPA 8270D

Laboratory: ENCO Orlando
SDG: A302870-CTO0037
Client: CH2M Hill, Inc. (CH029)
Project: East Vieques La Chiva SWMU 1, CTO-0037
Calibration: 1304084
Instrument: OSVGCMS1
Matrix: Water
Calibration Date: 04/25/13 14:38

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
4-Chloroaniline	0.420784	10.81733	8.596875	0.1299278			15	
4-Chloroaniline	0.420784	10.81733	8.596875	0.1299278			15	
Hexachlorobutadiene	0.133537	11.14084	8.696125	3.570073E-02			CCC (30)	
Hexachlorobutadiene	0.133537	11.14084	8.696125	3.570073E-02			CCC (30)	
Caprolactam	0.1023145	7.930677	9.0035	0.2410231	0.9997362		0.995	
Caprolactam	0.1023145	7.930677	9.0035	0.2410231	0.9997362		0.995	
4-Chloro-3-methylphenol	0.2875731	5.662493	9.173125	0.1065105			CCC (30)	
4-Chloro-3-methylphenol	0.2875731	5.662493	9.173125	0.1065105			CCC (30)	
Hexachlorocyclopentadiene	0.160971	3.91213	9.6115	5.126929E-02			SPCC (0.05)	
Hexachlorocyclopentadiene	0.160971	3.91213	9.6115	5.126929E-02			SPCC (0.05)	
1,2,4,5-Tetrachlorobenzene	0.5777248	12.52696	9.624429	6.801648E-02			15	
1,2,4,5-Tetrachlorobenzene	0.5777248	12.52696	9.624429	6.801648E-02			15	
2,4,6-Trichlorophenol	0.3906062	2.717846	9.7515	5.009164E-02			CCC (30)	
2,4,6-Trichlorophenol	0.3906062	2.717846	9.7515	5.009164E-02			CCC (30)	
2,4,5-Trichlorophenol	0.4048454	6.596888	9.796625	0.1011245			15	
2,4,5-Trichlorophenol	0.4048454	6.596888	9.796625	0.1011245			15	
1,1'-Biphenyl	1.408911	14.49249	9.982667	4.906209E-02			15	
1,1'-Biphenyl	1.408911	14.49249	9.982667	4.906209E-02			15	
2-Nitroaniline	0.2872128	6.284036	10.13212	9.884085E-02			15	
2-Nitroaniline	0.2872128	6.284036	10.13212	9.884085E-02			15	
Dimethylphthalate	1.380391	6.878142	10.346	0.1170416			15	
Dimethylphthalate	1.380391	6.878142	10.346	0.1170416			15	
2,6-Dinitrotoluene	0.321366	5.339978	10.42987	0.1170326			15	
2,6-Dinitrotoluene	0.321366	5.339978	10.42987	0.1170326			15	
3-Nitroaniline	0.2941958	9.995937	10.6465	0.1019011			15	
3-Nitroaniline	0.2941958	9.995937	10.6465	0.1019011			15	
2,4-Dinitrophenol	0.1094045	37.65892	10.77271	0.1071948	JWJ	0.9956609	SPCC (0.05)	
2,4-Dinitrophenol	0.1094045	37.65892	10.77271	0.1071948		0.9956609	SPCC (0.05)	
4-Nitrophenol	0.1206959	13.08687	10.83529	0.1667762			SPCC (0.05)	
4-Nitrophenol	0.1206959	13.08687	10.83529	0.1667762			SPCC (0.05)	
Dibenzofuran	1.550377	12.47786	10.98488	6.975772E-02			15	
Dibenzofuran	1.550377	12.47786	10.98488	6.975772E-02			15	

INITIAL CALIBRATION DATA (Continued)

EPA 8270D

Laboratory: ENCO Orlando

SDG: A302870-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Calibration: 1304084

Instrument: OSVGCMS1

Matrix: Soil

Calibration Date: 04/25/13 14:38

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
2,4-Dinitrotoluene	0.3453686	11.07432	10.9405	0.1387042			15	
2,4-Dinitrotoluene	0.3453686	11.07432	10.9405	0.1387042			15	
2,3,4,6-Tetrachlorophenol	0.2947519	7.254076	11.1305	4.339181E-02			15	
2,3,4,6-Tetrachlorophenol	0.2947519	7.254076	11.1305	4.339181E-02			15	
Diethylphthalate	1.313816	11.00762	11.22375	9.913253E-02			15	
Diethylphthalate	1.313816	11.00762	11.22375	9.913253E-02			15	
4-Chlorophenyl-phenylether	0.6288451	10.68041	11.3905	6.295195E-02			15	
4-Chlorophenyl-phenylether	0.6288451	10.68041	11.3905	6.295195E-02			15	
4-Nitroaniline	0.2551348	8.570398	11.42925	0.1868726			15	
4-Nitroaniline	0.2551348	8.570398	11.42925	0.1868726			15	
2-Methyl-4,6-dinitrophenol	0.1790558	30.22664	11.458	0.1193095	J/UJ	0.9979228	0.99	
2-Methyl-4,6-dinitrophenol	0.1790558	30.22664	11.458	0.1193095		0.9979228	0.99	
N-nitrosodiphenylamine/Diphenylamine	0.9340443	13.85035	11.53729	0.0993536			15	
N-nitrosodiphenylamine/Diphenylamine	0.9340443	13.85035	11.53729	0.0993536			15	
4-Bromophenyl-phenylether	0.2478567	7.341758	12.01163	0.0391537			15	
4-Bromophenyl-phenylether	0.2478567	7.341758	12.01163	0.0391537			15	
Hexachlorobenzene	0.2677796	14.31915	12.12487	6.982579E-02			15	
Hexachlorobenzene	0.2677796	14.31915	12.12487	6.982579E-02			15	
Atrazine	0.3543928	5.458518	12.18083	7.041725E-02			15	
Atrazine	0.3543928	5.458518	12.18083	7.041725E-02			15	
Pentachlorophenol	0.1386658	10.69653	12.3585	7.961759E-02			CCC (30)	
Pentachlorophenol	0.1386658	10.69653	12.3585	7.961759E-02			CCC (30)	
Carbazole	0.9210803	8.251612	12.881	4.871411E-02			15	
Carbazole	0.9210803	8.251612	12.881	4.871411E-02			15	
Di-n-butylphthalate	1.318872	14.38763	13.26286	4.735941E-02			15	
Di-n-butylphthalate	1.318872	14.38763	13.26286	4.735941E-02			15	
Butylbenzylphthalate	0.3370092	6.03829	15.19925	3.254494E-02			15	
Butylbenzylphthalate	0.3370092	6.03829	15.19925	3.254494E-02			15	
3,3'-Dichlorobenzidine	0.3430223	6.014244	16.1015	3.503599E-02			15	
3,3'-Dichlorobenzidine	0.3430223	6.014244	16.1015	3.503599E-02			15	
Bis(2-ethylhexyl)phthalate	0.7507349	8.731109	16.107	1.481631E-02			15	
Bis(2-ethylhexyl)phthalate	0.7507349	8.731109	16.107	1.481631E-02			15	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24398	Instrument:	OSVGCMS1
		Calibration:	1304084

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA24398-TUN1	1f3001.D	06/03/13 09:36
Calibration Check	AA24398-CCV1	1f3002.D	06/03/13 09:49
Calibration Check	AA24398-CCV2	1f3003.D	06/03/13 10:17
Instrument RL Check	AA24398-CRL1	1f3004.D	06/03/13 10:46
Blank	3E22007-BLK1	1f3005.D	06/03/13 11:14
LCS	3E22007-BS1	1f3006.D	06/03/13 11:42
Veno-SD02-000H	3E22007-MS1	1f3007.D	06/03/13 12:11
Veno-SD02-000H	3E22007-MSD1	1f3008.D	06/03/13 12:39
~~VENO-SD04-000H~~	A302870-05	1f3021.D	06/03/13 18:51
VENO-SD04-0H01	A302870-06	1f3022.D	06/03/13 19:20
VENO-SD05-000H	A302870-07	1f3023.D	06/03/13 19:48
VENO-SD06-000H	A302870-08	1f3024.D	06/03/13 20:17
VENO-SD07-000H	A302870-09	1f3025.D	06/03/13 20:45
VENO-SD07P-000H	A302870-10	1f3026.D	06/03/13 21:13

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1f3002.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24398	Injection Date:	06/03/13
Lab Sample ID:	AA24398-CCV1	Injection Time:	09:49

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Phenol	A	50.0	47	1.689286	1.605678		-4.9	20
Bis(2-chloroethyl)ether	A	50.0	46	1.321272	1.238048		-6.3	20
2-Chlorophenol	A	50.0	49	1.533498	1.49972		-2.2	20
2-Methylphenol	A	50.0	47	1.193165	1.114891		-6.6	20
Bis(2-chloroisopropyl)ether	A	50.0	47	2.116017	2.003114		-5.3	20
Acetophenone	A	50.0	44	1.88376	1.685536		-10.5	20
3 & 4-Methylphenol	Q	100	93	1.201132	1.005152		-6.6	20
N-Nitroso-di-n-propylamine	A	50.0	46	0.8771514	0.831172	0.05	-5.2	20
Hexachloroethane	A	50.0	51	0.6637878	0.6870651		3.5	20
Nitrobenzene	A	50.0	53	0.3702381	0.3898397		5.3	20
Isophorone	A	50.0	47	0.6814322	0.6450938		-5.3	20
2-Nitrophenol	A	50.0	51	0.1975773	0.1991617		0.8	20
2,4-Dimethylphenol	A	50.0	46	0.3606494	0.3317925		-8.0	20
Bis(2-chloroethoxy)methane	A	50.0	56	0.4863715	0.525957		8.1	20
2,4-Dichlorophenol	A	50.0	47	0.3146341	0.2941624		-6.5	20
4-Chloroaniline	A	50.0	48	0.420784	0.4058986		-3.5	20
Hexachlorobutadiene	A	50.0	52	0.133537	0.1386822		3.9	20
4-Chloro-3-methylphenol	A	50.0	50	0.2875731	0.2912282		1.3	20
Hexachlorocyclopentadiene	A	50.0	46	0.160971	0.1469257	0.05	-8.7	20
1,2,4,5-Tetrachlorobenzene	A	50.0	51	0.5777248	0.5941719		2.8	20
2,4,6-Trichlorophenol	A	50.0	49	0.3906062	0.3830367		-1.9	20
2,4,5-Trichlorophenol	A	50.0	50	0.4048454	0.4084489		0.9	20
2-Nitroaniline	A	50.0	59	0.2872128	0.3393129		18.1	20
Dimethylphthalate	A	50.0	50	1.380391	1.389091		0.6	20
2,6-Dinitrotoluene	A	50.0	49	0.321366	0.3157428		-1.7	20
3-Nitroaniline	A	50.0	56	0.2941958	0.3298385		12.1	20
2,4-Dinitrophenol	Q	50.0	63	0.1094045	0.1891839	0.05	26.9	20 * JN
4-Nitrophenol	A	50.0	69	0.1206959	0.1716166	0.05	42.2	20 * JN
Dibenzofuran	A	50.0	51	1.550377	1.577133		1.7	20

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1f3002.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24398	Injection Date:	06/03/13
Lab Sample ID:	AA24398-CCV1	Injection Time:	09:49

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
2,4-Dinitrotoluene	A	50.0	60	0.3453686	0.4193774		21.4	20 *	J/UJ
2,3,4,6-Tetrachlorophenol	A	50.0	55	0.2947519	0.3254578		10.4	20	
Diethylphthalate	A	50.0	52	1.313816	1.367474		4.1	20	
4-Chlorophenyl-phenylether	A	50.0	50	0.6288451	0.6264092		-0.4	20	
4-Nitroaniline	A	50.0	63	0.2551348	0.326343		27.9	20 *	J/UJ
2-Methyl-4,6-dinitrophenol	Q	50.0	54	0.1790558	0.2571171		8.2	20	
N-nitrosodiphenylamine/Diphenylam	A	100	100	0.9340443	0.9848232		5.4	20	
4-Bromophenyl-phenylether	A	50.0	46	0.2478567	0.2295137		-7.4	20	
Hexachlorobenzene	A	50.0	45	0.2677796	0.2408662		-10.1	20	
Pentachlorophenol	A	50.0	56	0.1386658	0.1569705		13.2	20	
Carbazole	A	50.0	53	0.9210803	0.9859446		7.0	20	
Di-n-butylphthalate	A	50.0	47	1.318872	1.254951		-4.8	20	
Butylbenzylphthalate	A	50.0	60	0.3370092	0.4091973		21.4	20 *	J/UJ
3,3'-Dichlorobenzidine	A	50.0	53	0.3430223	0.3645568		6.3	20	
Bis(2-ethylhexyl)phthalate	A	50.0	52	0.7507349	0.7855493		4.6	20	
Di-n-octylphthalate	Q	50.0	53	1.026902	1.300694		6.7	20	

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTQ0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTQ-0037
Sequence:	AA24423	Instrument:	OSVGCMS1
		Calibration:	1304084

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA24423-TUN1	1f5001.D	06/05/13 11:02
Calibration Check	AA24423-CCV2	1f5002.D	06/05/13 11:16
Calibration Check	AA24423-CCV1	1f5003.D	06/05/13 11:44
Instrument RL Check	AA24423-CRL1	1f5004.D	06/05/13 12:13
Blank	3E22001-BLK1	1f5005.D	06/05/13 12:41
LCS	3E22001-BS1	1f5006.D	06/05/13 13:09
LCS Dup	3E22001-BSD1	1f5007.D	06/05/13 13:38
VENO-EB01-051713-SD	A302870-11	1f5010.D	06/05/13 15:03

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1f5003.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24423	Injection Date:	06/05/13
Lab Sample ID:	AA24423-CCV1	Injection Time:	11:44

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Phenol	A	50.0	48	1.689286	1.617159		-4.3	20
Bis(2-chloroethyl)ether	A	50.0	48	1.321272	1.300908		-1.5	20
2-Chlorophenol	A	50.0	51	1.533498	1.552941		1.3	20
2-Methylphenol	A	50.0	50	1.193165	1.193457		0.02	20
Bis(2-chloroisopropyl)ether	A	50.0	50	2.116017	2.12146		0.3	20
Acetophenone	A	50.0	46	1.88376	1.74886		-7.2	20
3 & 4-Methylphenol	Q	100	97	1.201132	1.03333		-2.6	20
N-Nitroso-di-n-propylamine	A	50.0	50	0.8771514	0.8953231	0.05	2.1	20
Hexachloroethane	A	50.0	53	0.6637878	0.7037441		6.0	20
Nitrobenzene	A	50.0	52	0.3702381	0.3868131		4.5	20
Isophorone	A	50.0	52	0.6814322	0.7156853		5.0	20
2-Nitrophenol	A	50.0	51	0.1975773	0.1995943		1.0	20
2,4-Dimethylphenol	A	50.0	47	0.3606494	0.3388591		-6.0	20
Bis(2-chloroethoxy)methane	A	50.0	58	0.4863715	0.5421676		11.5	20
2,4-Dichlorophenol	A	50.0	48	0.3146341	0.3041436		-3.3	20
4-Chloroaniline	A	50.0	50	0.420784	0.4230471		0.5	20
Hexachlorobutadiene	A	50.0	51	0.133537	0.1358111		1.7	20
4-Chloro-3-methylphenol	A	50.0	57	0.2875731	0.3264283		13.5	20
Hexachlorocyclopentadiene	A	50.0	43	0.160971	0.1367276	0.05	-15.1	20
1,2,4,5-Tetrachlorobenzene	A	50.0	50	0.5777248	0.5839634		1.1	20
2,4,6-Trichlorophenol	A	50.0	51	0.3906062	0.3951695		1.2	20
2,4,5-Trichlorophenol	A	50.0	50	0.4048454	0.4031567		-0.4	20
2-Nitroaniline	A	50.0	59	0.2872128	0.3397253		18.3	20
Dimethylphthalate	A	50.0	49	1.380391	1.370197		-0.7	20
2,6-Dinitrotoluene	A	50.0	48	0.321366	0.3080651		-4.1	20
3-Nitroaniline	A	50.0	52	0.2941958	0.3090914		5.1	20
2,4-Dinitrophenol	Q	50.0	56	0.1094045	0.1677564	0.05	12.9	20
4-Nitrophenol	A	50.0	60	0.1206959	0.1497185	0.05	24.0	20 *
Dibenzofuran	A	50.0	51	1.550377	1.577133		1.7	20

JW

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1f5003.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24423	Injection Date:	06/05/13
Lab Sample ID:	AA24423-CCV1	Injection Time:	11:44

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
2,4-Dinitrotoluene	A	50.0	54	0.3453686	0.3773141		9.2	20
2,3,4,6-Tetrachlorophenol	A	50.0	53	0.2947519	0.3138181		6.5	20
Diethylphthalate	A	50.0	48	1.313816	1.278421		-2.7	20
4-Chlorophenyl-phenylether	A	50.0	53	0.6288451	0.667005		6.1	20
4-Nitroaniline	A	50.0	55	0.2551348	0.2838535		11.3	20
2-Methyl-4,6-dinitrophenol	Q	50.0	47	0.1790558	0.2181885		-5.9	20
N-nitrosodiphenylamine/Diphenylam	A	100	99	0.9340443	0.9317645		-0.2	20
4-Bromophenyl-phenylether	A	50.0	50	0.2478567	0.2462324		-0.7	20
Hexachlorobenzene	A	50.0	52	0.2677796	0.279425		4.3	20
Pentachlorophenol	A	50.0	53	0.1386658	0.1506073		8.6	20
Carbazole	A	50.0	50	0.9210803	0.9237331		0.3	20
Di-n-butylphthalate	A	50.0	45	1.318872	1.213567		-8.0	20
Butylbenzylphthalate	A	50.0	51	0.3370092	0.3469804		3.0	20
3,3'-Dichlorobenzidine	A	50.0	51	0.3430223	0.3517633		2.5	20
Bis(2-ethylhexyl)phthalate	A	50.0	52	0.7507349	0.7907036		5.3	20
Di-n-octylphthalate	Q	50.0	49	1.026902	1.192878		-2.5	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24468	Instrument:	OSVGCMS1
		Calibration:	1304084

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA24468-TUN1	1fe001.D	06/10/13 10:14
Calibration Check	AA24468-CCV1	1fe002.D	06/10/13 10:28
Calibration Check	AA24468-CCV2	1fe003.D	06/10/13 11:25
Instrument RL Check	AA24468-CRL1	1fe004.D	06/10/13 11:53
Blank	3F06021-BLK1	1fe013.D	06/10/13 16:38
LCS	3F06021-BS1	1fe014.D	06/10/13 17:06
LCS Dup	3F06021-BSD1	1fe015.D	06/10/13 17:35
VENO-SD04-000H	A302870-05RE1	1fe018.D	06/10/13 19:01

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1fe002.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24468	Injection Date:	06/10/13
Lab Sample ID:	AA24468-CCV1	Injection Time:	10:28

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Phenol	A	50.0	50	1.689286	1.676699		-0.7	20
Bis(2-chloroethyl)ether	A	50.0	50	1.321272	1.348793		2.1	20
2-Chlorophenol	A	50.0	53	1.533498	1.623502		5.9	20
2-Methylphenol	A	50.0	51	1.193165	1.223194		2.5	20
Bis(2-chloroisopropyl)ether	A	50.0	49	2.116017	2.08872		-1.3	20
Acetophenone	A	50.0	48	1.88376	1.823158		-3.2	20
3 & 4-Methylphenol	Q	100	110	1.201132	1.116428		10.0	20
N-Nitroso-di-n-propylamine	A	50.0	48	0.8771514	0.8640592	0.05	-1.5	20
Hexachloroethane	A	50.0	54	0.6637878	0.7150569		7.7	20
Nitrobenzene	A	50.0	53	0.3702381	0.3958845		6.9	20
Isophorone	A	50.0	50	0.6814322	0.6819915		0.08	20
2-Nitrophenol	A	50.0	53	0.1975773	0.2091639		5.9	20
2,4-Dimethylphenol	A	50.0	48	0.3606494	0.3493353		-3.1	20
Bis(2-chloroethoxy)methane	A	50.0	58	0.4863715	0.5425963		11.6	20
2,4-Dichlorophenol	A	50.0	50	0.3146341	0.3110463		-1.1	20
4-Chloroaniline	A	50.0	51	0.420784	0.4254935		1.1	20
Hexachlorobutadiene	A	50.0	51	0.133537	0.137003		2.6	20
4-Chloro-3-methylphenol	A	50.0	54	0.2875731	0.3107002		8.0	20
Hexachlorocyclopentadiene	A	50.0	44	0.160971	0.1411043	0.05	-12.3	20
1,2,4,5-Tetrachlorobenzene	A	50.0	52	0.5777248	0.5987072		3.6	20
2,4,6-Trichlorophenol	A	50.0	50	0.3906062	0.391		0.1	20
2,4,5-Trichlorophenol	A	50.0	50	0.4048454	0.4047181		-0.03	20
2-Nitroaniline	A	50.0	58	0.2872128	0.3384649		17.8	20
Dimethylphthalate	A	50.0	49	1.380391	1.36033		-1.5	20
2,6-Dinitrotoluene	A	50.0	49	0.321366	0.3155483		-1.8	20
3-Nitroaniline	A	50.0	53	0.2941958	0.3119498		6.0	20
2,4-Dinitrophenol	Q	50.0	55	0.1094045	0.1636498	0.05	10.2	20
4-Nitrophenol	A	50.0	70	0.1206959	0.1727453	0.05	43.1	20 * JV
Dibenzofuran	A	50.0	50	1.550377	1.558624		0.5	20

CONTINUING CALIBRATION CHECK

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCMS1	Calibration:	1304084
Lab File ID:	1fe002.D	Calibration Date:	04/25/13 14:38
Sequence:	AA24468	Injection Date:	06/10/13
Lab Sample ID:	AA24468-CCV1	Injection Time:	10:28

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
2,4-Dinitrotoluene	A	50.0	57	0.3453686	0.4003286		15.9	20
2,3,4,6-Tetrachlorophenol	A	50.0	53	0.2947519	0.3163824		7.3	20
Diethylphthalate	A	50.0	50	1.313816	1.322216		0.6	20
4-Chlorophenyl-phenylether	A	50.0	51	0.6288451	0.6484395		3.1	20
4-Nitroaniline	A	50.0	61	0.2551348	0.3143032		23.2	20 * JVC
2-Methyl-4,6-dinitrophenol	Q	50.0	48	0.1790558	0.2256932		-3.2	20
N-nitrosodiphenylamine/Diphenylam	A	100	100	0.9340443	0.9607244		2.9	20
4-Bromophenyl-phenylether	A	50.0	47	0.2478567	0.2357128		-4.9	20
Hexachlorobenzene	A	50.0	48	0.2677796	0.2558145		-4.5	20
Pentachlorophenol	A	50.0	51	0.1386658	0.1442912		4.1	20
Carbazole	A	50.0	51	0.9210803	0.9436196		2.4	20
Di-n-butylphthalate	A	50.0	46	1.318872	1.220289		-7.5	20
Butylbenzylphthalate	A	50.0	52	0.3370092	0.3583426		6.3	20
3,3'-Dichlorobenzidine	A	50.0	56	0.3430223	0.3862984		12.6	20
Bis(2-ethylhexyl)phthalate	A	50.0	52	0.7507349	0.7825499		4.2	20
Di-n-octylphthalate	Q	50.0	53	1.026902	1.293829		6.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

	YES	NO	N/A
13.6 If the pesticide compounds include DDT, was the percent breakdown of DDT to DDD and DDE greater than 20%?		[ ]	✓

ACTION: If DDT percent breakdown exceeds 20%:

i. Qualify all positive results for DDT with "J". If DDT was not detected, but DDD and DDE results are positive, qualify the quantitation limit for DDT as unusable, "R".

ii. Qualify all positive results for DDD and DDE as presumptively present at an approximate concentration "JN".

14.0 GC/MS Calibration Verification (Form VII/Equivalent)

	YES	NO	N/A
14.1 Are the Calibration Verification Forms (Form VII) present and complete for all compounds of interest?	✓		
14.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument?	✓		

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

_____

_____

_____

ACTION: If any forms are missing or no calibration verification standard has been analyzed within twelve hours of every sample analysis,

	YES	NO	N/A
call lab for explanation/resubmittal. If continuing calibration data are not available, flag all associated sample data as unusable ("R").			
14.3 Do any of the SPCCs have an RRF <0.05?		✓	
If YES, make a note in data assessment if the lab did not take corrective action specified in section 7.4.4, page 8270D-18.	[ ]	✓	
14.4 Do any of the CCCs have a %D between the initial and continuing RRF which exceeds 20.0%?			
ACTION: If yes, make a note in data assessment.			
14.5 Do any semivolatile compounds have a % Difference (% D) between the initial and continuing RRF which exceeds 20.0%?	✓	[ ]	
ACTION: Circle all outliers in red.			
ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated (J). When %D is above 90%, qualify all non-detects for that analyte as "R", unusable.			
14.6 Do any semivolatile compounds have a RRF < 0.05?		✓	
ACTION: Circle all outliers in red.			
ACTION: If RRF < 0.05, qualify as unusable ("R") associated non-detects and "J" associated positive values.			
14.7 Are there any transcription/calculation errors in the reporting of average response factors (RRF) or percent difference (%D) between initial and continuing RRFs? (Check at least two values but if errors are found, check more).		✓	

YES NO N/A

ACTION: Circle errors in red.

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect(s) in the data assessments.

15.0 Internal Standards (Form VIII)

15.1 Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits (-50% to + 100%) for each continuing calibration? ✓ ___ ___

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area	LowerLimit	Upper Limit

NA

(Attach additional sheets if necessary.)

Note: Check Table 5, 8270D-41 for associated analytes.

ACTION: i. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results and non-detects (U values) quantitated with this internal standard.

ii. Non-detects associated with IS > 100% should not be qualified.

	YES	NO	N/A
iii. If the IS area is below the lower limit (<50%), qualify all associated non-detects (U-values) "J". If extremely low area counts are reported (<25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable (R).			
15.2 Are the retention times of all internal standards within 30 seconds of the associated calibration standard?	✓		

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

16.0 Laboratory Control Samples (LCS)

	YES	NO	N/A
16.1 Were any LCS samples run in order to verify analytes which failed criteria for spike recovery?		✓	
16.2 Did the lab spike LCS sample spiked with the same analytes and the same concentrations as the matrix spike?	✓		
16.3 Were the mean and standard deviation of all analytes within the QC acceptance ranges as shown in Table 6, 8270D-43?		✓	

ACTION: If the recovery of any analyte falls out of the designated range, the analytical results for that compound is suspect and should be qualified "J" in the unspiked samples.

See attached form
no qual

17.0 Field Duplicates

	YES	NO	N/A
17.1 Were any field duplicates submitted for semivolatile analysis?	✓		

PREPARATION BATCH SUMMARY

EPA 8270D

Laboratory: ENCO Orlando SDG: A302870-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Batch: 3E22001 Batch Matrix: Water Preparation: EPA 3510C_MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	3E22001-BLK1	1f5005.D	05/22/13 01:30	
LCS	3E22001-BS1	1f5006.D	05/22/13 01:30	
LCS Dup	3E22001-BSD1	1f5007.D	05/22/13 01:30	
VENO-EB01-051713-SD	A302870-11	1f5010.D	05/22/13 01:30	

high rec - no ⊕ for compds, no qual

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Water		
Batch:	3E22001	Laboratory ID:	3E22001-BS1
Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Benzaldehyde	50.0	49	99 *	43 - 87
Phenol	50.0	18	37	0 - 115
Bis(2-chloroethyl)ether	50.0	46	91	35 - 110
2-Chlorophenol	50.0	39	79	35 - 105
2-Methylphenol	50.0	34	68	40 - 110
Bis(2-chloroisopropyl)ether	50.0	41	82	25 - 130
Acetophenone	50.0	42	83	41 - 92
3 & 4-Methylphenol	50.0	31	63	30 - 110
N-Nitroso-di-n-propylamine	50.0	52	103	35 - 130
Hexachloroethane	50.0	24	49	30 - 100
Nitrobenzene	50.0	42	84	45 - 110
Isophorone	50.0	46	92	50 - 110
2-Nitrophenol	50.0	41	82	40 - 115
2,4-Dimethylphenol	50.0	37	73	30 - 110
Bis(2-chloroethoxy)methane	50.0	36	73	45 - 105
2,4-Dichlorophenol	50.0	39	77	50 - 105
4-Chloroaniline	50.0	34	69	15 - 110
Hexachlorobutadiene	50.0	23	47	25 - 105
Caprolactam	50.0	20	40	10 - 51
4-Chloro-3-methylphenol	50.0	43	87	45 - 110
Hexachlorocyclopentadiene	50.0	22	43	10 - 117
1,2,4,5-Tetrachlorobenzene	50.0	26	53	24 - 69
2,4,6-Trichlorophenol	50.0	40	79	50 - 115
2,4,5-Trichlorophenol	50.0	40	81	50 - 110
1,1'-Biphenyl	50.0	38	76	46 - 83
2-Nitroaniline	50.0	50	100	50 - 115
Dimethylphthalate	50.0	37	75	25 - 125
2,6-Dinitrotoluene	50.0	44	88	50 - 115
3-Nitroaniline	50.0	46	91	20 - 125
2,4-Dinitrophenol	50.0	50	101	15 - 140

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Water		
Batch:	3E22001	Laboratory ID:	3E22001-BS1
Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
4-Nitrophenol	50.0	31	62	0 - 125
Dibenzofuran	50.0	39	77	55 - 105
2,4-Dinitrotoluene	50.0	57	113	50 - 120
2,3,4,6-Tetrachlorophenol	50.0	48	95 *	61 - 94
Diethylphthalate	50.0	47	95	40 - 120
4-Chlorophenyl-phenylether	50.0	43	86	50 - 110
4-Nitroaniline	50.0	58	116	35 - 120
2-Methyl-4,6-dinitrophenol	50.0	52	104	40 - 130
N-nitrosodiphenylamine/Diphenylamine	50.0	46	92	50 - 110
4-Bromophenyl-phenylether	50.0	39	78	50 - 115
Hexachlorobenzene	50.0	45	89	50 - 110
Atrazine	50.0	52	103 *	47 - 101
Pentachlorophenol	50.0	50	99	40 - 115
Carbazole	50.0	52	103	50 - 115
Di-n-butylphthalate	50.0	51	103	55 - 115
Butylbenzylphthalate	50.0	56	112	45 - 115
3,3'-Dichlorobenzidine	50.0	43	86	20 - 110
Bis(2-ethylhexyl)phthalate	50.0	58	116	40 - 125
Di-n-octylphthalate	50.0	51	102	35 - 135

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzaldehyde	50.0	44	89 *	11	30	43 - 87
Phenol	50.0	16	33	11	30	0 - 115
Bis(2-chloroethyl)ether	50.0	41	81	11	30	35 - 110
2-Chlorophenol	50.0	36	71	10	30	35 - 105
2-Methylphenol	50.0	31	61	11	30	40 - 110
Bis(2-chloroisopropyl)ether	50.0	36	72	12	30	25 - 130
Acetophenone	50.0	37	74	11	30	41 - 92
3 & 4-Methylphenol	50.0	27	55	14	30	30 - 110

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Water		
Batch:	3E22001	Laboratory ID:	3E22001-BSD1
Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
N-Nitroso-di-n-propylamine	50.0	45	90	14	30	35 - 130
Hexachloroethane	50.0	22	45	9	30	30 - 100
Nitrobenzene	50.0	38	76	11	30	45 - 110
Isophorone	50.0	41	82	12	30	50 - 110
2-Nitrophenol	50.0	39	77	6	30	40 - 115
2,4-Dimethylphenol	50.0	33	65	11	30	30 - 110
Bis(2-chloroethoxy)methane	50.0	33	65	11	30	45 - 105
2,4-Dichlorophenol	50.0	35	70	10	30	50 - 105
4-Chloroaniline	50.0	31	62	10	30	15 - 110
Hexachlorobutadiene	50.0	21	43	10	30	25 - 105
Caprolactam	50.0	18	37	9	30	10 - 51
4-Chloro-3-methylphenol	50.0	39	78	11	30	45 - 110
Hexachlorocyclopentadiene	50.0	20	40	7	30	10 - 117
1,2,4,5-Tetrachlorobenzene	50.0	24	48	9	30	24 - 69
2,4,6-Trichlorophenol	50.0	36	72	9	30	50 - 115
2,4,5-Trichlorophenol	50.0	37	73	9	30	50 - 110
1,1'-Biphenyl	50.0	34	68	10	30	46 - 83
2-Nitroaniline	50.0	46	91	9	30	50 - 115
Dimethylphthalate	50.0	34	68	10	30	25 - 125
2,6-Dinitrotoluene	50.0	39	79	11	30	50 - 115
3-Nitroaniline	50.0	42	83	9	30	20 - 125
2,4-Dinitrophenol	50.0	48	97	4	30	15 - 140
4-Nitrophenol	50.0	29	58	7	30	0 - 125
Dibenzofuran	50.0	35	70	10	30	55 - 105
2,4-Dinitrotoluene	50.0	52	103	9	30	50 - 120
2,3,4,6-Tetrachlorophenol	50.0	43	86	10	30	61 - 94
Diethylphthalate	50.0	43	87	9	30	40 - 120
4-Chlorophenyl-phenylether	50.0	38	77	11	30	50 - 110
4-Nitroaniline	50.0	54	107	8	30	35 - 120
2-Methyl-4,6-dinitrophenol	50.0	49	99	5	30	40 - 130

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Water		
Batch:	3E22001	Laboratory ID:	3E22001-BSD1
Preparation:	EPA 3510C_MS	Initial/Final:	500 mL / 0.5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
N-nitrosodiphenylamine/Diphenylam	50.0	42	84	9	30	50 - 110
4-Bromophenyl-phenylether	50.0	34	68	13	30	50 - 115
Hexachlorobenzene	50.0	39	78	14	30	50 - 110
Atrazine	50.0	46	93	11	30	47 - 101
Pentachlorophenol	50.0	45	91	9	30	40 - 115
Carbazole	50.0	46	92	11	30	50 - 115
Di-n-butylphthalate	50.0	45	90	13	30	55 - 115
Butylbenzylphthalate	50.0	49	99	13	30	45 - 115
3,3'-Dichlorobenzidine	50.0	38	77	12	30	20 - 110
Bis(2-ethylhexyl)phthalate	50.0	52	104	10	30	40 - 125
Di-n-octylphthalate	50.0	46	93	10	30	35 - 135

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

EPA 8270D

Laboratory: ENCO Orlando SDG: A302870-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Batch: 3E22007 Batch Matrix: Soil Preparation: EPA 3550C_MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	3E22007-BLK1	1f3005.D	05/22/13 09:00	
LCS	3E22007-BS1	1f3006.D	05/22/13 09:00	
Veno-SD02-000H	3E22007-MS1	1f3007.D	05/22/13 09:00	
Veno-SD02-000H	3E22007-MSD1	1f3008.D	05/22/13 09:00	
VENO-SD04-000H	A302870-05	1f3021.D	05/22/13 09:00	
VENO-SD04-0H01	A302870-06	1f3022.D	05/22/13 09:00	
VENO-SD05-000H	A302870-07	1f3023.D	05/22/13 09:00	
VENO-SD06-000H	A302870-08	1f3024.D	05/22/13 09:00	
VENO-SD07-000H	A302870-09	1f3025.D	05/22/13 09:00	
VENO-SD07P-000H	A302870-10	1f3026.D	05/22/13 09:00	

high rec - no ⊕ for compd, no qual

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E22007	Laboratory ID:	3E22007-BS1
Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	LCS % REC. #	QC LIMITS REC.
Benzaldehyde	1.67	1.4	83	45 - 99
Phenol	1.67	1.2	70	40 - 100
Bis(2-chloroethyl)ether	1.67	1.3	76	40 - 105
2-Chlorophenol	1.67	1.1	68	45 - 105
2-Methylphenol	1.67	1.1	65	40 - 105
Bis(2-chloroisopropyl)ether	1.67	1.2	73	20 - 115
Acetophenone	1.67	1.2	71	52 - 86
3 & 4-Methylphenol	1.67	1.2	72	40 - 105
N-Nitroso-di-n-propylamine	1.67	1.5	90	40 - 115
Hexachloroethane	1.67	1.2	70	35 - 110
Nitrobenzene	1.67	1.3	78	40 - 115
Isophorone	1.67	1.5	92	45 - 110
2-Nitrophenol	1.67	1.2	74	40 - 110
2,4-Dimethylphenol	1.67	1.1	65	30 - 105
Bis(2-chloroethoxy)methane	1.67	1.2	69	45 - 110
2,4-Dichlorophenol	1.67	1.2	75	45 - 110
4-Chloroaniline	1.67	0.94	57	10 - 100
Hexachlorobutadiene	1.67	1.2	74	40 - 115
Caprolactam	1.67	2.1	124	14 - 125
4-Chloro-3-methylphenol	1.67	1.5	92	45 - 115
Hexachlorocyclopentadiene	1.67	1.3	80	10 - 170
1,2,4,5-Tetrachlorobenzene	1.67	1.4	81	59 - 81
2,4,6-Trichlorophenol	1.67	1.4	84	45 - 110
2,4,5-Trichlorophenol	1.67	1.4	86	50 - 110
1,1'-Biphenyl	1.67	1.6	94	52 - 100
2-Nitroaniline	1.67	1.7	103	45 - 120
Dimethylphthalate	1.67	1.6	99	50 - 110
2,6-Dinitrotoluene	1.67	1.6	94	50 - 110
3-Nitroaniline	1.67	1.4	86	25 - 110
2,4-Dinitrophenol	1.67	0.99	59	15 - 130

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E22007	Laboratory ID:	3E22007-BS1
Preparation:	EPA 3550C MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	LCS % REC. #	QC LIMITS REC.
4-Nitrophenol	1.67	1.9	114	15 - 140
Dibenzofuran	1.67	1.5	91	50 - 105
2,4-Dinitrotoluene	1.67	1.9	113	50 - 115
2,3,4,6-Tetrachlorophenol	1.67	1.6	97	18 - 98
Diethylphthalate	1.67	1.8	106	50 - 115
4-Chlorophenyl-phenylether	1.67	1.6	95	45 - 110
4-Nitroaniline	1.67	1.5	92	35 - 115
2-Methyl-4,6-dinitrophenol	1.67	1.5	90	30 - 135
N-nitrosodiphenylamine/Diphenylamine	1.67	1.6	96	50 - 115
4-Bromophenyl-phenylether	1.67	1.5	90	45 - 115
Hexachlorobenzene	1.67	1.7	100	45 - 120
Atrazine	1.67	1.6	94	45 - 120
Pentachlorophenol	1.67	1.5	91	25 - 120
Carbazole	1.67	1.8	106	45 - 115
Di-n-butylphthalate	1.67	1.7	103	55 - 110
Butylbenzylphthalate	1.67	2.3	136 *	50 - 125
3,3'-Dichlorobenzidine	1.67	1.3	76	10 - 130
Bis(2-ethylhexyl)phthalate	1.67	1.9	115	45 - 125
Di-n-octylphthalate	1.67	1.9	112	40 - 130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

PREPARATION BATCH SUMMARY

EPA 8270D

Laboratory: ENCO Orlando SDG: A302870-CTO0037

Client: CH2M Hill, Inc. (CH029) Project: East Vieques La Chiva SWMU 1, CTO-0037

Batch: 3F06021 Batch Matrix: Soil Preparation: EPA 3550C MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	3F06021-BLK1	1fe013.D	06/07/13 09:45	
LCS	3F06021-BS1	1fe014.D	06/07/13 09:45	
LCS Dup	3F06021-BSD1	1fe015.D	06/07/13 09:45	
VENO-SD04-000H	A302870-05RE1	1fe018.D	06/07/13 09:45	

high rec - no ⊕ for compd, no qual

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3F06021	Laboratory ID:	3F06021-BS1
Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	LCS % REC. #	QC LIMITS REC.
Benzaldehyde	1.67	1.5	92	45 - 99
Phenol	1.67	1.4	86	40 - 100
Bis(2-chloroethyl)ether	1.67	1.5	92	40 - 105
2-Chlorophenol	1.67	1.4	84	45 - 105
2-Methylphenol	1.67	1.3	79	40 - 105
Bis(2-chloroisopropyl)ether	1.67	1.4	86	20 - 115
Acetophenone	1.67	1.4	86	52 - 86
3 & 4-Methylphenol	1.67	1.4	86	40 - 105
N-Nitroso-di-n-propylamine	1.67	1.7	102	40 - 115
Hexachloroethane	1.67	1.4	85	35 - 110
Nitrobenzene	1.67	1.5	88	40 - 115
Isophorone	1.67	1.5	92	45 - 110
2-Nitrophenol	1.67	1.4	87	40 - 110
2,4-Dimethylphenol	1.67	1.2	70	30 - 105
Bis(2-chloroethoxy)methane	1.67	1.3	75	45 - 110
2,4-Dichlorophenol	1.67	1.3	80	45 - 110
4-Chloroaniline	1.67	0.90	54	10 - 100
Hexachlorobutadiene	1.67	1.4	84	40 - 115
Caprolactam	1.67	1.7	104	14 - 125
4-Chloro-3-methylphenol	1.67	1.5	90	45 - 115
Hexachlorocyclopentadiene	1.67	1.5	91	10 - 170
1,2,4,5-Tetrachlorobenzene	1.67	1.5	89 *	59 - 81
2,4,6-Trichlorophenol	1.67	1.4	86	45 - 110
2,4,5-Trichlorophenol	1.67	1.4	84	50 - 110
1,1'-Biphenyl	1.67	1.5	92	52 - 100
2-Nitroaniline	1.67	1.7	100	45 - 120
Dimethylphthalate	1.67	1.5	90	50 - 110
2,6-Dinitrotoluene	1.67	1.4	86	50 - 110
3-Nitroaniline	1.67	1.3	79	25 - 110
2,4-Dinitrophenol	1.67	1.0	62	15 - 130

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3F06021	Laboratory ID:	3F06021-BS1
Preparation:	EPA 3550C MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	LCS % REC. #	QC LIMITS REC.
4-Nitrophenol	1.67	1.9	114	15 - 140
Dibenzofuran	1.67	1.5	88	50 - 105
2,4-Dinitrotoluene	1.67	1.7	104	50 - 115
2,3,4,6-Tetrachlorophenol	1.67	1.5	92	18 - 98
Diethylphthalate	1.67	1.6	97	50 - 115
4-Chlorophenyl-phenylether	1.67	1.5	91	45 - 110
4-Nitroaniline	1.67	1.5	91	35 - 115
2-Methyl-4,6-dinitrophenol	1.67	1.5	90	30 - 135
N-nitrosodiphenylamine/Diphenylamine	1.67	1.5	87	50 - 115
4-Bromophenyl-phenylether	1.67	1.4	83	45 - 115
Hexachlorobenzene	1.67	1.5	88	45 - 120
Atrazine	1.67	1.7	104	45 - 120
Pentachlorophenol	1.67	1.3	76	25 - 120
Carbazole	1.67	1.5	88	45 - 115
Di-n-butylphthalate	1.67	1.6	97	55 - 110
Butylbenzylphthalate	1.67	1.8	110	50 - 125
3,3'-Dichlorobenzidine	1.67	1.3	75	10 - 130
Bis(2-ethylhexyl)phthalate	1.67	1.8	107	45 - 125
Di-n-octylphthalate	1.67	1.7	103	40 - 130

COMPOUND	SPIKE ADDED (mg/kg wet)	LCSD CONCENTRATION (mg/kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzaldehyde	1.67	1.5	93	2	30	45 - 99
Phenol	1.67	1.5	89	4	30	40 - 100
Bis(2-chloroethyl)ether	1.67	1.6	93	2	30	40 - 105
2-Chlorophenol	1.67	1.4	87	4	30	45 - 105
2-Methylphenol	1.67	1.4	82	4	30	40 - 105
Bis(2-chloroisopropyl)ether	1.67	1.4	86	0.4	30	20 - 115
Acetophenone	1.67	1.5	89 *	4	30	52 - 86
3 & 4-Methylphenol	1.67	1.4	86	0.09	30	40 - 105

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3F06021	Laboratory ID:	3F06021-BSD1
Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCSD CONCENTRATION (mg/kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
N-Nitroso-di-n-propylamine	1.67	1.7	102	0.5	30	40 - 115
Hexachloroethane	1.67	1.4	86	0.9	30	35 - 110
Nitrobenzene	1.67	1.5	89	2	30	40 - 115
Isophorone	1.67	1.5	91	1	30	45 - 110
2-Nitrophenol	1.67	1.5	90	4	30	40 - 110
2,4-Dimethylphenol	1.67	1.2	71	1	30	30 - 105
Bis(2-chloroethoxy)methane	1.67	1.3	75	0.3	30	45 - 110
2,4-Dichlorophenol	1.67	1.4	83	3	30	45 - 110
4-Chloroaniline	1.67	0.92	55	2	30	10 - 100
Hexachlorobutadiene	1.67	1.4	83	0.9	30	40 - 115
Caprolactam	1.67	1.8	109	5	30	14 - 125
4-Chloro-3-methylphenol	1.67	1.6	95	5	30	45 - 115
Hexachlorocyclopentadiene	1.67	1.7	101	10	30	10 - 170
1,2,4,5-Tetrachlorobenzene	1.67	1.5	88 *	0.4	30	59 - 81
2,4,6-Trichlorophenol	1.67	1.5	87	2	30	45 - 110
2,4,5-Trichlorophenol	1.67	1.5	88	4	30	50 - 110
1,1'-Biphenyl	1.67	1.5	92	0.6	30	52 - 100
2-Nitroaniline	1.67	1.8	108	8	30	45 - 120
Dimethylphthalate	1.67	1.5	90	0.04	30	50 - 110
2,6-Dinitrotoluene	1.67	1.5	87	1	30	50 - 110
3-Nitroaniline	1.67	1.4	83	5	30	25 - 110
2,4-Dinitrophenol	1.67	1.1	67	8	30	15 - 130
4-Nitrophenol	1.67	2.2	130	13	30	15 - 140
Dibenzofuran	1.67	1.5	90	3	30	50 - 105
2,4-Dinitrotoluene	1.67	1.8	107	3	30	50 - 115
2,3,4,6-Tetrachlorophenol	1.67	1.6	96	4	30	18 - 98
Diethylphthalate	1.67	1.6	98	0.6	30	50 - 115
4-Chlorophenyl-phenylether	1.67	1.5	93	2	30	45 - 110
4-Nitroaniline	1.67	1.7	102	11	30	35 - 115
2-Methyl-4,6-dinitrophenol	1.67	1.6	93	4	30	30 - 135

LCS / LCS DUPLICATE RECOVERY

EPA 8270D

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3F06021	Laboratory ID:	3F06021-BSD1
Preparation:	EPA 3550C_MS	Initial/Final:	30 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCSD CONCENTRATION (mg/kg wet)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
N-nitrosodiphenylamine/Diphenylam	1.67	1.5	92	5	30	50 - 115
4-Bromophenyl-phenylether	1.67	1.4	82	1	30	45 - 115
Hexachlorobenzene	1.67	1.4	85	4	30	45 - 120
Atrazine	1.67	1.9	112	7	30	45 - 120
Pentachlorophenol	1.67	1.3	79	4	30	25 - 120
Carbazole	1.67	1.5	92	4	30	45 - 115
Di-n-butylphthalate	1.67	1.5	93	5	30	55 - 110
Butylbenzylphthalate	1.67	1.8	107	3	30	50 - 125
3,3'-Dichlorobenzidine	1.67	1.3	79	4	30	10 - 130
Bis(2-ethylhexyl)phthalate	1.67	1.8	106	0.7	30	45 - 125
Di-n-octylphthalate	1.67	1.8	106	3	30	40 - 130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

YES NO N/A

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, identification of field duplicates should be confirmed by contacting the sampler.

VENO-SD07-000H
VENO-SD07P-000H
Not
No qual

Sample VENO-SD04-000H exhibited low surr rec. including zero and <10% rec. The sample was RE out of HT w/ similar non-compl surr rec however there were no zero % rec and ∴ the RE was used.

Initial Calibration Date: 4/24/2013

RRF and %RSD Calculations:

Compound Name: phenol
Lab Value: 1.792

Area of Compound	312861
Area of Internal STD	349085
Conc. of Internal STD	40
Conc. of Compound	20
Calculated RRF	1.792

Compound Name: nitrobenzene
Lab Value: 8.77

RRF of STD 1	0.412
RRF of STD 2	0.3979607
RRF of STD 3	0.3934665
RRF of STD 4	0.3727513
RRF of STD 5	0.3725207
RRF of STD 6	0.3590465
RRF of STD 7	0.34256
RRF of STD 8	0.3116514
Calculated % RSD	8.77

Continuing Calibration File ID: 6/5/2013

RRF and %D Calculations:

Compound Name: 2-chlorophenol
Lab Value: 1.553

Area of Compound	900667
Area of Internal STD	463980
Conc. of Internal STD	40
Conc. of Compound	50
Calculated RRF	1.553

Compound Name: butylbenzylphthalate
Lab Value: 3.0

Average RRF	0.3370092
Calibration Check RRF	0.3469804
Calculated % D	-3.0

Jacqueline Cleveland

From:	Marcia Colon <mcolon@encolabs.com>
Sent:	Wednesday, July 10, 2013 6:11 AM
To:	'DataQual'
Cc:	Juliana.Dean@ch2m.com; 'Michael Zamboni'; 'Jacqueline Cleveland'
Subject:	RE: CTO-037 La Chiva SVOA fraction

Hi Laura-

The samples VENO-SD04-0H01 (A302870-06), VENO-SD05-000H (A302870-07), VENO-SD06-000H (A302870-08), VENO-SD02-000H (A302428-10), VENO-SD01P-000H (A302428-08), VENO-SD01-0H01 (A302428-09), VENO-SD12-000H (A302428-12) and VENO-SD02-0H01 (A302428-13) were not re-extracted due to their matrix interference issues. The client was informed of the low surrogate issues for a number of samples from this site in multiple methods. There were many comments and observations about matrix interferences with these particular samples. The laboratory decided to re-extract a sample from each different SDG to confirm the original results and matrix interference effects.

Marcia Colon
Project Manager

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mcolon@encolabs.com

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ENCO is an eco-friendly lab offering paperless service options, please contact me anytime with questions.

From: DataQual [mailto:dataqual@charter.net]
Sent: Monday, July 08, 2013 3:21 PM
To: Marcia Colon
Cc: Juliana.Dean@ch2m.com; Michael Zamboni; Jacqueline Cleveland
Subject: CTO-037 La Chiva SVOA fraction

Hi Marcia,

The following questions are for project CTO-037 East Vieques La Chiva concerning the **SVOA fraction** data packages.

SDG# A302870

- Samples VENO-SD04-0H01 (A302870-06), VENO-SD05-000H (A302870-07) and VENO-SD06-000H (A302870-08) exhibited a low surrogate recoveries for all surrogates. Surrogate results exhibited for all these samples include zero and less than 10% recoveries. I am not finding that the samples were re-analyzed. Please check if the samples were re-analyzed and if so please provide the sample analysis and all associated forms for all samples listed.

SDG# A302428

- Samples VENO-SD02-000H (A302428-10), VENO-SD01P-000H (A302428-08), VENO-SD01-0H01 (A302428-09), VENO-SD12-000H (A302428-12) and VENO-SD02-0H01 (A302428-13) exhibited two or more low surrogate recoveries. I am not finding that the samples were re-analyzed. Please check if the samples were re-analyzed and if so please provide the sample analysis and all associated forms for all samples listed.

If there are any questions concerning these issues please feel free to contact me.

Thank you,
Laura

Laura Maschhoff
DataQual Environmental Services, LLC
dataqual@charter.net
314-330-1327

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: Na SDG# A302870
LAB: ENCO Labs SITE: E. Vieques SWMU La Chuva

1.0 Data Completeness and Deliverables	YES	NO	N/A
1.1 Has all the data been submitted in CLP deliverable format?	[ ]	✓	✓
1.2 Have any missing deliverables been received and added to the data package?	[✓]		

ACTION: Call lab for explanation/resubmittal of any missing deliverables. If lab cannot provide them, note the effect on review of the data in the reviewer narrative.

2.0 Cover Letter, SDG Narrative			
2.1 Is a laboratory narrative or cover letter present?	[✓]		
2.2 Are the case number and/or SDG number contained in the narrative or cover letter?	[✓]		

3.0 Data Validation Checklist			
3.1 Does this data package contain:			
Water data? EB	[✓]		
Waste data?	[ ]		✓
Soil/solid data? SD & SB	[✓]		

ORGANOCHLORINE PESTICIDE

YES NO N/A

1.0 Traffic Reports and Laboratory Narrative

1.1 Are traffic report and chain-of-custody forms present for all samples? [✓] ___ ___

ACTION: If no, contact lab for replacement of missing or illegible copies.

1.2 Do the traffic reports, chain-of-custody forms or SDG narrative indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data? ✓ [ ] ___

high % moisture quals required

ACTION: If any sample analyzed as a soil, other than than TCLP, contains 50%-90% water, all data should be qualified as estimated, "J." If a soil sample, other than TCLP, contains more than 90% water, all non detects are qualified as unusable, "R", and positive results flagged "J".

ACTION: If samples were not iced or if the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10° C), flag all positive results "J" and all non-detects "UJ".

2.0 Holding Times

2.1 Have any organochlorine pesticide technical holding times, determined from date of collection to date of extraction, been exceeded? ✓ [ ] ___

Exclude REI samples

Water and waste samples for organochlorine pesticide analysis must be extracted within 7 days of the date of collection. Extracts must be analyzed within 40 days of the date of extraction Soils and solid samples must be extracted within 14 days of collection and analyzed within 40 days of extraction.

Additional Region II Worksheet listing samples that contain 50-90% water

SDG# 302870

All results for samples listed below were flagged as estimated (J/UJ).

Sample ID	% Moisture
VENO-SD04-000H	76.15
VENO-SD04-0H01	68.45
VENO-SD05-000H	72.18
VENO-SD06-000H	63.09

ACTION: Qualify sample results according to Table 1.

Table 1. Holding Time Criteria

Matrix	Preserved	Criteria	Action	
			Detected compounds	Non-detected compounds
Aqueous	No	≤ 7 days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 7 days (extraction) > 40 days (analysis)	J*	UJ
	Yes	≤ 7 days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R
Non-aqueous	No	≤ 14days (extraction) ≤ 40 days (analysis)	J*	UJ*
	No	> 14days (extraction) >40 days (analysis)	J	UJ
	Yes	≤ 14days (extraction) ≤ 40 days (analysis)	No qualification	
	Yes	> 14days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 28 days (gross exceedance)	J	R

* only if cooler temperature exceeds 10°C; no action required if cooler temperature < 10°C.

HOLDING TIME SUMMARY

EPA 8081B

Laboratory: ENCO Orlando

SDG: A302870-CTO0037

Client: CH2M Hill, Inc. (CH029)

Project: East Vieques La Chiva SWMU 1, CTO-0037

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q	
VENO-SS03-0001	05/16/13 14:20	05/18/13 09:25	05/21/13 03:30	5.00	14.00	06/04/13 17:59	14.00	40.00		
VENO-SS02-0001	05/16/13 14:35	05/18/13 09:25	05/21/13 14:30	5.00	14.00	06/04/13 13:33	13.00	40.00		
VENO-SS02-0001	05/16/13 14:35	05/18/13 09:25	06/05/13 10:30	20.00	14.00	06/07/13 13:35	2.00	40.00	*	NR-Repo Origi
VENO-SS06-0001	05/16/13 15:10	05/18/13 09:25	05/21/13 03:30	5.00	14.00	06/04/13 18:11	14.00	40.00		
VENO-EB02-051613-SS	05/16/13 06:45	05/18/13 09:25	05/20/13 13:30	4.00	7.00	06/04/13 14:21	15.00	40.00		
VENO-SD04-000H	05/17/13 08:35	05/18/13 09:25	05/21/13 03:30	4.00	14.00	06/04/13 18:23	14.00	40.00		
VENO-SD04-0H01	05/17/13 08:20	05/18/13 09:25	05/21/13 14:30	4.00	14.00	06/04/13 18:35	14.00	40.00		
VENO-SD05-000H	05/17/13 09:10	05/18/13 09:25	05/21/13 14:30	4.00	14.00	06/04/13 18:47	14.00	40.00		
VENO-SD06-000H	05/17/13 09:35	05/18/13 09:25	05/21/13 14:30	4.00	14.00	06/04/13 18:59	14.00	40.00		
VENO-SD07-000H	05/17/13 10:15	05/18/13 09:25	05/21/13 14:30	4.00	14.00	06/04/13 19:11	14.00	40.00		
VENO-SD07-000H	05/17/13 10:15	05/18/13 09:25	06/06/13 12:45	20.00	14.00	06/07/13 15:00	1.00	40.00	*	NR-Repo Orig
VENO-SD07P-000H	05/17/13 10:15	05/18/13 09:25	05/21/13 14:30	4.00	14.00	06/04/13 19:23	14.00	40.00		
VENO-EB01-051713-SD	05/17/13 07:00	05/18/13 09:25	05/20/13 13:30	3.00	7.00	06/04/13 14:33	15.00	40.00		

YES NO N/A

3.0 Surrogate Recovery (Form II/Equivalent)

3.1 Were the recoveries of tetrachloro-m-xylene (TCMX) and decachlorobiphenyl (DCB) presented on CLP Surrogate Recovery Summary forms (Form II), or equivalent, for each of the following matrices?

a. Water/Waste [✓] ___ ___

b. Soil/Solid [✓] ___ ___

3.2 Are all the pesticide samples listed on the appropriate surrogate recovery form for each of the following matrices?

a. Water [✓] ___ ___

b. Waste [ ] ___ ✓

c. Soil/Solid [✓] ___ ___

ACTION: Call lab for explanation/resubmittals. If missing deliverables are unavailable, document the effect in the data assessment.

3.3 Are all recovery limits for the surrogates TCMX and DCB between ~~30-150%~~ for all samples, including MS and MSDs, LCSs and all blanks? [ ] ✓ ___

Note: Reviewer shall use lab in-house recover limits if available. In-house criteria should be examined for reasonableness.

ACTION: Circle all outliers in red. Follow surrogate action Table 2. See Form 2 for flags

3.5 Were surrogate retention times (RT) within the windows established during the initial 5-point analysis? [✓] ___ ___

ACTION: Follow surrogate action, Table 2 below. RT were stable

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24376	Instrument:	OSVGCECD2
Matrix:	Water	Calibration:	1304047

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
LCS Dup (3E20028-BSD1)			Lab File ID: 2F4008.D		Analyzed: 06/04/13 11:33			
2,4,5,6-TCMX	1.00	106	25 - 140	2.156	2.003333	0.1527	+/-1.0	
2,4,5,6-TCMX	1.00	106	25 - 140	2.156	2.003333	0.1527	+/-1.0	
2,4,5,6-TCMX [2C]	1.00	92	25 - 140	2.037	1.894667	0.1423	+/-1.0	
2,4,5,6-TCMX [2C]	1.00	92	25 - 140	2.037	1.894667	0.1423	+/-1.0	
Decachlorobiphenyl	1.00	85	30 - 135	6.19	6.021	0.1690	+/-1.0	
Decachlorobiphenyl	1.00	85	30 - 135	6.19	6.021	0.1690	+/-1.0	
Decachlorobiphenyl [2C]	1.00	76	30 - 135	6.253	6.089167	0.1638	+/-1.0	
Decachlorobiphenyl [2C]	1.00	76	30 - 135	6.253	6.089167	0.1638	+/-1.0	
Blank (3E21001-BLK1)			Lab File ID: 2F4009.D		Analyzed: 06/04/13 11:45			
2,4,5,6-TCMX	0.0333	126	70 - 125	2.15	2.003333	0.1467	+/-1.0	* NQ
2,4,5,6-TCMX	0.0333	126	70 - 125	2.15	2.003333	0.1467	+/-1.0	*
2,4,5,6-TCMX [2C]	0.0333	117	70 - 125	2.033	1.894667	0.1383	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	117	70 - 125	2.033	1.894667	0.1383	+/-1.0	
Decachlorobiphenyl	0.0333	142	55 - 130	6.188	6.021	0.1670	+/-1.0	*
Decachlorobiphenyl	0.0333	142	55 - 130	6.188	6.021	0.1670	+/-1.0	*
Decachlorobiphenyl [2C]	0.0333	127	55 - 130	6.252	6.089167	0.1628	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	127	55 - 130	6.252	6.089167	0.1628	+/-1.0	
LCS (3E21001-BS1)			Lab File ID: 2F4010.D		Analyzed: 06/04/13 11:57			
2,4,5,6-TCMX	0.0333	104	70 - 125	2.155	2.003333	0.1517	+/-1.0	
2,4,5,6-TCMX	0.0333	104	70 - 125	2.155	2.003333	0.1517	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	91	70 - 125	2.038	1.894667	0.1433	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	91	70 - 125	2.038	1.894667	0.1433	+/-1.0	
Decachlorobiphenyl	0.0333	86	55 - 130	6.189	6.021	0.1680	+/-1.0	
Decachlorobiphenyl	0.0333	86	55 - 130	6.189	6.021	0.1680	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	77	55 - 130	6.253	6.089167	0.1638	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	77	55 - 130	6.253	6.089167	0.1638	+/-1.0	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24376	Instrument:	OSVGCECD2
Matrix:	Soil	Calibration:	1304047

Surrogate Compound	Spike Level mg/kg wet	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Blank (3E21021-BLK1)			Lab File ID: 2F4011.D		Analyzed: 06/04/13 12:09			
2,4,5,6-TCMX	0.0333	89	70 - 125	2.15	2.003333	0.1467	+/-1.0	
2,4,5,6-TCMX	0.0333	89	70 - 125	2.15	2.003333	0.1467	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	84	70 - 125	2.033	1.894667	0.1383	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	84	70 - 125	2.033	1.894667	0.1383	+/-1.0	
Decachlorobiphenyl	0.0333	102	55 - 130	6.189	6.021	0.1680	+/-1.0	
Decachlorobiphenyl	0.0333	102	55 - 130	6.189	6.021	0.1680	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	93	55 - 130	6.253	6.089167	0.1638	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	93	55 - 130	6.253	6.089167	0.1638	+/-1.0	
LCS (3E21021-BS1)			Lab File ID: 2F4012.D		Analyzed: 06/04/13 12:21			
2,4,5,6-TCMX	0.0333	92	70 - 125	2.156	2.003333	0.1527	+/-1.0	
2,4,5,6-TCMX	0.0333	92	70 - 125	2.156	2.003333	0.1527	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	81	70 - 125	2.038	1.894667	0.1433	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	81	70 - 125	2.038	1.894667	0.1433	+/-1.0	
Decachlorobiphenyl	0.0333	76	55 - 130	6.189	6.021	0.1680	+/-1.0	
Decachlorobiphenyl	0.0333	76	55 - 130	6.189	6.021	0.1680	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	68	55 - 130	6.253	6.089167	0.1638	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	68	55 - 130	6.253	6.089167	0.1638	+/-1.0	
Matrix Spike (3E21001-MS1)			Lab File ID: 2F4013.D		Analyzed: 06/04/13 12:33			
2,4,5,6-TCMX	0.0708	62	70 - 125	2.15	2.003333	0.1467	+/-1.0	*
2,4,5,6-TCMX	0.0708	62	70 - 125	2.15	2.003333	0.1467	+/-1.0	*
2,4,5,6-TCMX [2C]	0.0708	59	70 - 125	2.033	1.894667	0.1383	+/-1.0	*
2,4,5,6-TCMX [2C]	0.0708	59	70 - 125	2.033	1.894667	0.1383	+/-1.0	*
Decachlorobiphenyl	0.0708	71	55 - 130	6.188	6.021	0.1670	+/-1.0	
Decachlorobiphenyl	0.0708	71	55 - 130	6.188	6.021	0.1670	+/-1.0	
Decachlorobiphenyl [2C]	0.0708	59	55 - 130	6.253	6.089167	0.1638	+/-1.0	
Decachlorobiphenyl [2C]	0.0708	59	55 - 130	6.253	6.089167	0.1638	+/-1.0	

NQ

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24376	Instrument:	OSVGCECD2
Matrix:	Water	Calibration:	1304047

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q	
Matrix Spike Dup (3E21001-MSD1)			Lab File ID: 2F4014.D		Analyzed: 06/04/13 12:45				
2,4,5,6-TCMX	0.0710	51	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	NQ
2,4,5,6-TCMX	0.0710	51	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0710	49	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0710	49	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
Decachlorobiphenyl	0.0710	64	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl	0.0710	64	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0710	53	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0710	53	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	
Matrix Spike (3E21021-MS1)			Lab File ID: 2F4016.D		Analyzed: 06/04/13 13:09				
2,4,5,6-TCMX	0.0460	44	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	NQ
2,4,5,6-TCMX	0.0460	44	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0460	41	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0460	41	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
Decachlorobiphenyl	0.0460	50	55 - 130	6.189	6.021	0.1680	+/-1.0	*	
Decachlorobiphenyl	0.0460	50	55 - 130	6.189	6.021	0.1680	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0460	43	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0460	43	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	
Matrix Spike Dup (3E21021-MSD1)			Lab File ID: 2F4017.D		Analyzed: 06/04/13 13:21				
2,4,5,6-TCMX	0.0460	49	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	NQ
2,4,5,6-TCMX	0.0460	49	70 - 125	2.15	2.003333	0.1467	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0460	46	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
2,4,5,6-TCMX [2C]	0.0460	46	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
Decachlorobiphenyl	0.0460	48	55 - 130	6.189	6.021	0.1680	+/-1.0	*	
Decachlorobiphenyl	0.0460	48	55 - 130	6.189	6.021	0.1680	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0460	41	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0460	41	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	
VENO-SS02-0001 (A302870-02)			Lab File ID: 2F4018.D		Analyzed: 06/04/13 13:33				
2,4,5,6-TCMX	0.0458	41	70 - 125	2.149	2.003333	0.1457	+/-1.0	*	J/K
2,4,5,6-TCMX [2C]	0.0458	40	70 - 125	2.033	1.894667	0.1383	+/-1.0	*	
Decachlorobiphenyl	0.0458	48	55 - 130	6.19	6.021	0.1690	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0458	42	55 - 130	6.254	6.089167	0.1648	+/-1.0	*	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory: ENCO Orlando
SDG: A302870-CTO0037
Client: CH2M Hill, Inc. (CH029)
Project: East Vieques La Chiva SWMU 1, CTO-0037

Sequence: AA24376
Instrument: OSVGCECD2
Matrix: Water
Calibration: 1304047

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q	
VENO-EB02-051613-SS (A302870-04)			Lab File ID: 2F4022.D		Analyzed: 06/04/13 14:21				
2,4,5,6-TCMX	1.00	80	25 - 140	2.15	2.003333	0.1467	+/-1.0		
2,4,5,6-TCMX [2C]	1.00	72	25 - 140	2.033	1.894667	0.1383	+/-1.0		
Decachlorobiphenyl	1.00	79	30 - 135	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	1.00	69	30 - 135	6.253	6.089167	0.1638	+/-1.0		
VENO-EB01-051713-SD (A302870-11)			Lab File ID: 2F4023.D		Analyzed: 06/04/13 14:33				
2,4,5,6-TCMX	1.00	85	25 - 140	2.15	2.003333	0.1467	+/-1.0		
2,4,5,6-TCMX [2C]	1.00	78	25 - 140	2.034	1.894667	0.1393	+/-1.0		
Decachlorobiphenyl	1.00	83	30 - 135	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	1.00	73	30 - 135	6.253	6.089167	0.1638	+/-1.0		
VENO-SS03-0001 (A302870-01)			Lab File ID: 2F4040.D		Analyzed: 06/04/13 17:59				
2,4,5,6-TCMX	0.0466	80	70 - 125	2.152	2.003333	0.1487	+/-1.0		
2,4,5,6-TCMX [2C]	0.0466	70	70 - 125	2.035	1.894667	0.1403	+/-1.0		
Decachlorobiphenyl	0.0466	80	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.0466	69	55 - 130	6.253	6.089167	0.1638	+/-1.0		
VENO-SS06-0001 (A302870-03)			Lab File ID: 2F4041.D		Analyzed: 06/04/13 18:11				
2,4,5,6-TCMX	0.0657	67	70 - 125	2.153	2.003333	0.1497	+/-1.0	*	J/ü
2,4,5,6-TCMX [2C]	0.0657	61	70 - 125	2.035	1.894667	0.1403	+/-1.0	*	↓
Decachlorobiphenyl	0.0657	73	55 - 130	6.19	6.021	0.1690	+/-1.0		
Decachlorobiphenyl [2C]	0.0657	62	55 - 130	6.254	6.089167	0.1648	+/-1.0		
VENO-SD04-000H (A302870-05)			Lab File ID: 2F4042.D		Analyzed: 06/04/13 18:23				
2,4,5,6-TCMX	0.138	62	70 - 125	2.152	2.003333	0.1487	+/-1.0	*	J/ü
2,4,5,6-TCMX [2C]	0.138	59	70 - 125	2.035	1.894667	0.1403	+/-1.0	*	↓
Decachlorobiphenyl	0.138	69	55 - 130	6.189	6.021	0.1680	+/-1.0		
Decachlorobiphenyl [2C]	0.138	60	55 - 130	6.253	6.089167	0.1638	+/-1.0		
VENO-SD04-0H01 (A302870-06)			Lab File ID: 2F4043.D		Analyzed: 06/04/13 18:35				
2,4,5,6-TCMX	0.105	27	70 - 125	2.151	2.003333	0.1477	+/-1.0	*	J/
2,4,5,6-TCMX [2C]	0.105	25	70 - 125	2.034	1.894667	0.1393	+/-1.0	*	
Decachlorobiphenyl	0.105	34	55 - 130	6.189	6.021	0.1680	+/-1.0	*	
Decachlorobiphenyl [2C]	0.105	25	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	↓
VENO-SD05-000H (A302870-07)			Lab File ID: 2F4044.D		Analyzed: 06/04/13 18:47				
2,4,5,6-TCMX	0.120	17	70 - 125	2.151	2.003333	0.1477	+/-1.0	*	J/ü
2,4,5,6-TCMX [2C]	0.120	21	70 - 125	2.034	1.894667	0.1393	+/-1.0	*	
Decachlorobiphenyl	0.120	26	55 - 130	6.189	6.021	0.1680	+/-1.0	*	
Decachlorobiphenyl [2C]	0.120	21	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	↓

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24376	Instrument:	OSVGCECD2
Matrix:	Water	Calibration:	1304047

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q	
VENO-SD06-000H (A302870-08)			Lab File ID: 2F4045.D		Analyzed: 06/04/13 18:59				
2,4,5,6-TCMX	0.0903	35	70 - 125	2.151	2.003333	0.1477	+/-1.0	*	JK
2,4,5,6-TCMX [2C]	0.0903	35	70 - 125	2.034	1.894667	0.1393	+/-1.0	*	
Decachlorobiphenyl	0.0903	43	55 - 130	6.189	6.021	0.1680	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0903	38	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	
VENO-SD07-000H (A302870-09)			Lab File ID: 2F4046.D		Analyzed: 06/04/13 19:11				
2,4,5,6-TCMX	0.0437	22	70 - 125	2.151	2.003333	0.1477	+/-1.0	*	JK
2,4,5,6-TCMX [2C]	0.0437	20	70 - 125	2.034	1.894667	0.1393	+/-1.0	*	
Decachlorobiphenyl	0.0437	34	55 - 130	6.189	6.021	0.1680	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0437	33	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	
VENO-SD07P-000H (A302870-10)			Lab File ID: 2F4047.D		Analyzed: 06/04/13 19:23				
2,4,5,6-TCMX	0.0438	29	70 - 125	2.152	2.003333	0.1487	+/-1.0	*	JK
2,4,5,6-TCMX [2C]	0.0438	27	70 - 125	2.035	1.894667	0.1403	+/-1.0	*	
Decachlorobiphenyl	0.0438	39	55 - 130	6.19	6.021	0.1690	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0438	35	55 - 130	6.253	6.089167	0.1638	+/-1.0	*	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory: ENCO Orlando
SDG: A302870-CTO0037
Client: CH2M Hill, Inc. (CH029)
Project: East Vieques La Chiva SWMU 1, CTO-0037

Sequence: AA24452
Instrument: OSVGCECD2
Matrix: Soil
Calibration: 1304047

Surrogate Compound	Spike Level ug/mL	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA24452-CCV1)			Lab File ID: 2FB003.D		Analyzed: 06/07/13 10:28			
2,4,5,6-TCMX	0.100	109	80 - 120	2.136	2.003333	0.1327	+/-1.0	
2,4,5,6-TCMX [2C]	0.100	111	80 - 120	2.011	1.894667	0.1163	+/-1.0	
Decachlorobiphenyl	0.100	106	80 - 120	6.165	6.021	0.1440	+/-1.0	
Decachlorobiphenyl [2C]	0.100	105	80 - 120	6.222	6.089167	0.1328	+/-1.0	
Blank (3F06020-BLK1)			Lab File ID: 2FB007.D		Analyzed: 06/07/13 11:05			
2,4,5,6-TCMX	0.0333	103	70 - 125	2.134	2.003333	0.1307	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	102	70 - 125	2.013	1.894667	0.1183	+/-1.0	
Decachlorobiphenyl	0.0333	100	55 - 130	6.164	6.021	0.1430	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	98	55 - 130	6.222	6.089167	0.1328	+/-1.0	
LCS (3F06020-BS1)			Lab File ID: 2FB008.D		Analyzed: 06/07/13 11:17			
2,4,5,6-TCMX	0.0333	101	70 - 125	2.129	2.003333	0.1257	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	112	70 - 125	2.009	1.894667	0.1143	+/-1.0	
Decachlorobiphenyl	0.0333	115	55 - 130	6.165	6.021	0.1440	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	114	55 - 130	6.224	6.089167	0.1348	+/-1.0	
LCS Dup (3F06020-BSD1)			Lab File ID: 2FB009.D		Analyzed: 06/07/13 11:29			
2,4,5,6-TCMX	0.0333	89	70 - 125	2.129	2.003333	0.1257	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	98	70 - 125	2.009	1.894667	0.1143	+/-1.0	
Decachlorobiphenyl	0.0333	101	55 - 130	6.164	6.021	0.1430	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	99	55 - 130	6.223	6.089167	0.1338	+/-1.0	
Blank (3F05007-BLK1)			Lab File ID: 2FB010.D		Analyzed: 06/07/13 11:59			
2,4,5,6-TCMX	0.0333	127	70 - 125	2.142	2.003333	0.1387	+/-1.0	*
2,4,5,6-TCMX [2C]	0.0333	128	70 - 125	2.014	1.894667	0.1193	+/-1.0	*
Decachlorobiphenyl	0.0333	123	55 - 130	6.174	6.021	0.1530	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	120	55 - 130	6.229	6.089167	0.1398	+/-1.0	
LCS (3F05007-BS1)			Lab File ID: 2FB011.D		Analyzed: 06/07/13 12:11			
2,4,5,6-TCMX	0.0333	107	70 - 125	2.129	2.003333	0.1257	+/-1.0	
2,4,5,6-TCMX [2C]	0.0333	116	70 - 125	2.008	1.894667	0.1133	+/-1.0	
Decachlorobiphenyl	0.0333	115	55 - 130	6.166	6.021	0.1450	+/-1.0	
Decachlorobiphenyl [2C]	0.0333	111	55 - 130	6.224	6.089167	0.1348	+/-1.0	
Matrix Spike (3F05007-MS1)			Lab File ID: 2FB016.D		Analyzed: 06/07/13 13:11			
2,4,5,6-TCMX	0.0461	46	70 - 125	2.13	2.003333	0.1267	+/-1.0	*
2,4,5,6-TCMX [2C]	0.0461	51	70 - 125	2.009	1.894667	0.1143	+/-1.0	*
Decachlorobiphenyl	0.0461	94	55 - 130	6.165	6.021	0.1440	+/-1.0	
Decachlorobiphenyl [2C]	0.0461	94	55 - 130	6.223	6.089167	0.1338	+/-1.0	

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SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Sequence:	AA24452	Instrument:	OSVGCECD2
Matrix:	Soil	Calibration:	1304047

Surrogate Compound	Spike Level mg/kg dry	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q	
Matrix Spike Dup (3F05007-MSD1)			Lab File ID: 2FB017.D		Analyzed: 06/07/13 13:23				
2,4,5,6-TCMX	0.0461	49	70 - 125	2.13	2.003333	0.1267	+/-1.0	*	NC
2,4,5,6-TCMX [2C]	0.0461	54	70 - 125	2.01	1.894667	0.1153	+/-1.0	*	
Decachlorobiphenyl	0.0461	93	55 - 130	6.165	6.021	0.1440	+/-1.0		
Decachlorobiphenyl [2C]	0.0461	94	55 - 130	6.224	6.089167	0.1348	+/-1.0		
VENO-SS02-0001 (A302870-02RE1)			Lab File ID: 2FB018.D		Analyzed: 06/07/13 13:35				
2,4,5,6-TCMX	0.0461	35	70 - 125	2.13	2.003333	0.1267	+/-1.0	*	NC
2,4,5,6-TCMX [2C]	0.0461	40	70 - 125	2.01	1.894667	0.1153	+/-1.0	*	
Decachlorobiphenyl	0.0461	76	55 - 130	6.165	6.021	0.1440	+/-1.0		
Decachlorobiphenyl [2C]	0.0461	78	55 - 130	6.224	6.089167	0.1348	+/-1.0		
VENO-SD07-000H (A302870-09RE1)			Lab File ID: 2FB023.D		Analyzed: 06/07/13 15:00				
2,4,5,6-TCMX	0.0440	15	70 - 125	2.13	2.003333	0.1267	+/-1.0	*	NC
2,4,5,6-TCMX [2C]	0.0440	14	70 - 125	2.009	1.894667	0.1143	+/-1.0	*	
Decachlorobiphenyl	0.0440	14	55 - 130	6.166	6.021	0.1450	+/-1.0	*	
Decachlorobiphenyl [2C]	0.0440	13	55 - 130	6.224	6.089167	0.1348	+/-1.0	*	

*RE1's excluded in favor of original analyses.

YES NO N/A

Table 2. Surrogate Recovery Criteria

Criteria	Action	
	Detected Target Compounds	Non-detected Target Compounds
%R > 200%	J	Use professional judgement
150% < %R ≤ 200%	J	No qualification
30% ≤ %R ≤ 150%	No qualification	
10% ≤ %R < 30%	J	UJ
%R < 10% (sample dilution not a factor)	J	R
%R < 10% (sample dilution is a factor)	Use professional judgement	
RT out of RT window	Use professional judgement	
RT within RT window	No qualification	

3.6 Are there any transcription/calculation errors between raw data and Form II? [ ] ✓ ___

ACTION: If large errors exist, call lab for explanation/resubmittal. Make any necessary corrections and document the effect in data assessments.

4.0 Laboratory Control Sample(LCS)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples. [✓] ___ ___

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

YES NO N/A

4.2 Were Laboratory Control Samples analyzed at the required concentration for all analytes of interest as specified ~~in Table~~ 3 below. Lab SOP/SAP [✓] ___ ___

Note: Use lab in-house criteria, if available.

Table 3. LCS Spiking Criteria

LCS Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml	Recovery Limits (%)
gamma-BHC	0.05	1	50-120
Heptachor epoxide	0.05	1	50-120
Dieldrin	0.01	1	30-130
4,4'-DDE	0.01	1	50-150
Endrin	0.01	1	50-120
Endosulfan sulfate	0.01	1	50-120
gamma-Chloradane	0.05	1	30-130
Tetrachloro-m-xylene(surrogate)	0.20	3	30-150
Decachlorobiphenyl (surrogate)	0.40	3	30-150

Note: The LCS might be spiked with the same analytes at the same concentration as the matrix spike.

ACTION: If Laboratory Control Samples were not analyzed at the required concentration or the required frequency, make note in the data assessment and use professional judgement to determined the affect on the data.

4.3 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed in table above? [✓] ___ ___

YES NO N/A

ACTION: For LCS % recovery not meeting the required recovery, follow the required action in Table 4 below.

Table 4. LCS Recovery Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R > Upper Acceptance Limit	J	No qualification
%R < Upper Acceptance Limit	J	R
Lower Acceptance Limit ≤ %R ≤ Upper Acceptance Limit	No qualifications	

5.0 Matrix Spikes (Form III/Equivalent)

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? [✓] ___ ___

NOTE: For soil and waste samples showing detectable amounts of organics, the lab may substitute replicate samples in place of the matrix spike (see page 8000B-40, section 8.5.3).

veno - SD02 - 0001+
veno - SS02 - 0001

5.2 Have MS/MD or MS/MSD results been summarized on Form III/Equivalent? [✓] ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000B-39, section 8.5.])

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8081B

Veno-SD02-000H

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1. CTO-0037
Matrix:	Soil		
Batch:	3E21001	Laboratory ID:	3E21001-MS1
Preparation:	EPA 3550C	Initial/Final:	30.1 g / 10 mL

Source Sample Name: Veno-SD02-000H

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	MS CONCENTRATION (mg/kg dry)	MS % REC. #	QC LIMITS REC.	
4,4'-DDE	0.0708	0.017	0.066	69 *	70 - 125	NQ
4,4'-DDD	0.0708	0.0071	0.057	71	30 - 135	
4,4'-DDT	0.0708	0.0037	0.038	48	45 - 140	

COMPOUND	SPIKE ADDED (mg/kg dry)	MSD CONCENTRATION (mg/kg dry)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.	
4,4'-DDE	0.0710	0.066	68 *	0.009	30	70 - 125	NQ
4,4'-DDD	0.0710	0.065	82	13	30	30 - 135	
4,4'-DDT	0.0710	0.032	39 *	17	30	45 - 140	NQ

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

all samples not qualified - but native sample flagged J/UJ for DDE only. Found in SDG A302428.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8081B

VENO-SS02-0001

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Matrix:	Soil		
Batch:	3E21021	Laboratory ID:	3E21021-MS1
Preparation:	EPA 3550C	Initial/Final:	30.1 g / 10 mL

Source Sample Name: VENO-SS02-0001

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	MS CONCENTRATION (mg/kg dry)	MS % REC. #	QC LIMITS REC.	
4,4'-DDE	0.0460	ND	0.025	54 *	70 - 125	JNJ
4,4'-DDD	0.0460	ND	0.032	70	30 - 135	
4,4'-DDT	0.0460	ND	0.015	33 *	45 - 140	JNJ

COMPOUND	SPIKE ADDED (mg/kg dry)	MSD CONCENTRATION (mg/kg dry)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.	
4,4'-DDE	0.0460	0.027	59 *	9	30	70 - 125	JNJ
4,4'-DDD	0.0460	0.035	76	8	30	30 - 135	
4,4'-DDT	0.0460	0.018	39 *	16	30	45 - 140	JNJ

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Flag in native sample only.

	YES	NO	N/A
a. Water	[ ]	___	✓
b. Waste	[ ]	___	✓
c. Soil/Solid	[✓]	___	___

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 We Were Matrix Spike Samples analyzed at the required concentration for all analytes of interest as specified in ~~Table 5 below.~~ lab SOP/client SAP [✓] ___ ___

Note: Spiking analytes may differ from those in Table 5. Check QA project plan or task order.

Table 5. Matrix Spiking Criteria

Matrix Spike Compound	Spiking solution ug/l	Amount spiked to 100ml aqueous sample or 30g soil sample ml
gamma-BHC	0.05	1
Heptachor	0.05	1
Aldrin	0.05	1
Dieldrin	1.0	1
Endrin	1.0	1
4,4'-DDT	1.0	1

Note: For aqueous organic extractable, the spike concentration should be:

1) For regulatory compliance monitoring - the regulatory concentration limit or 1 to 5 times the expected background concentration, whichever is higher;

2) For all other aqueous samples - the larger of either 1 to 5 x times the expected background

YES NO N/A

concentration, or the same as the QC check sample concentration (see section 4 above);

3) For soil/solid and waste samples - the recommended concentration is 20 times the estimated quantitation limit (EQL).

No action is taken based on MS or replicate data alone. However, using informed professional judgement, the data reviewer may use the matrix spike or laboratory replicate results in conjunction with other QC criteria and determine the need for some qualification of the data. In some instances it may be determined that only the replicate or spiked samples are affected. Alternatively, the data may suggest that the laboratory is having a systematic problem with one or more analytes, thereby affecting all associated samples.

5.5 Do average recovery for each analyte meet the corresponding QC acceptance criteria listed in ~~Table 6 below.~~ Lab SOP / client SAP [ ] ✓ ___

Note: Use lab in-house criteria, if available. See Form 3's for qual's

Table 6. Matrix Spike Recovery Criteria

Compound	% Recovery Water	RPD Water	% Recovery Soil	RPD Soil
gamma-BHC	56-123	0-15	46-127	0-50
Heptachor	40-13	0-20	35-130	0-31
Aldrin	40-120	0-22	34-132	0-43
Dieldrin	52-126	0-18	31-134	0-38
Endrin	56-121	0-21	42-139	0-45
4,4'-DDT	38-127	0-27	23-134	0-50

NOTE: The actual number of MS analytes depends on the number analytes being measured (e.g., total number of MS plus MSD compounds). If only chlordane or toxaphene are the analytes of

YES NO N/A

interest, the spiked sample should contain the most representative multi-component analyte.

ACTION: Follow the matrix spike actions (Table 7) for pesticide analyses.

Table 7. Matrix Spike Qualifying Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% R ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use professional judgement
Lower Acceptance Limit ≤ %R; RPD ≤ Upper Acceptance Limit	No qualifications	

Note: When the results of the matrix spike analyses indicates a potential problem due to the sample matrix itself, the LCS results are used to verify the laboratory can perform analyses in a clean matrix.

6.0 Blanks (Form IV/Equivalent)

6.1 Was reagent blank data reported on Method Blank Summary form(s) (Form IV)?

6.2 Frequency of Analysis: Has a reagent blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch? ☑ ___ ___

Note: Method blank should be analyzed, either after the calibration standard or at any other time during the analytical shift.

YES NO N/A

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.3 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.

Is the chromatographic performance (baseline stability) for each instrument acceptable for pesticides? [✓] ___ ___

ACTION: Use professional judgement to determine the effect on the data.

7.0 Contamination

NOTE: "Water blanks", "distilled water blanks" and "drilling water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent/cleanup blanks have positive results for organochlorine pesticides? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample Dilution Factor and corrected for % moisture when necessary. ___ [✓] ___

7.2 Do any field/rinse blanks have positive organochlorine pesticide results? ___ [✓] ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in

YES NO N/A

another blank. Field blanks must be qualified for surrogate, or calibration QC problems.

ACTION: Follow the directions in Table 8 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 8. Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Clean up, Instrument, Field	Detects	Not detected	No qualification
	< CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	> CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U
		≥ CRQL and ≥ blank contamination	No qualification
	= CRQL	< CRQL	Report CRQL value with a U
		≥ CRQL	No qualification
	Gross contamination	Detects	Qualify results as unusable R

Note: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying the calibration criteria.

Note: When applied as described in Table 8 above, the contaminant concentration in the blank is multiplied by the sample dilution factor.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams", "junk peaks"), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference.

YES NO N/A

Non-detected pesticide target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

7.3 Are there field/rinse/equipment blanks associated with every sample? [✓] ___ ___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 Gas Chromatography with Electron Capture Detector (GC/ECD) Instrument Performance Check (CLP Form VI and Form VII Equivalent)

8.1 Was the proper gas chromatographic column used for the analysis of organochlorine pesticides? Check raw data, instrument logs, or contact the lab to determine what type of columns were used. (See Method 8081B-8, section 4.2) [✓] ___ ___

8.2 If capillary columns were used, were they both wide bore (.53 mm ID) fused silica GC columns, such as DB-608 and DB-1701 or equivalent. Indicate the specific type of column used for:

column 1: Stx-CLP Pesticides, 0.32mm

column 2: Stx-CLP Pesticides 2, 0.32mm

ACTION: Note any changes to the suggested materials in section 8.1 above in the data assessment. Also note the impact (positive or negative) such changes have on the analytical results.

9.0 Calibration and GC Performance

9.1 Are the following Gas Chromatograms and Data Systems Printouts for both columns present for all samples, blanks, MS, replicates?

a. DDT/endrin breakdown check [✓] ___ ___

189

	YES	NO	N/A
b. toxaphene	[ ]		✓
c. technical chlordane	[ ]		✓
d. 5 pt. initial calibration standards	[✓]		
e. calibration verification standards	[✓]		
f. LCS	[✓]		
g. Method blanks	[✓]		

ACTION: If no, take action specified in 3.2 above.

9.2 Has a DDT/endrin breakdown check standard (at the mid-concentration level) been analyzed at the beginning of each analytical sequence on both columns (page 8081B-24, section 8.2.3)?	[✓]		

ACTION: If no, take action as specified in 3.2 above.

9.3 Has the individual % breakdown exceeded 20.0% on either column for:

- 4,4' - DDT?		[✓]	
- endrin?		[✓]	

ACTION: If any % breakdown has failed the QC criteria in the breakdown check standard, qualify all sample analyses in the entire analytical sequence as described below.

a. If 4,4'-DDT breakdown is greater than 20.%:

i. Qualify all positive results for DDT with 'J". If DDT was not detected, but DDD and DDE are positive, then qualify the quantitation limit for DDT as unusable ("R").

ii. Qualify positive results for DDD and DDE as presumptively present at an approximated quantity ("NJ").

YES NO N/A

b. If endrin breakdown is greater than 20.0%:

i. Qualify all positive results for endrin with "J". If endrin was not detected, but endrin aldehyde and endrin ketone are positive, then qualify the quantitation limit for endrin as unusable ("R").

ii. Qualify positive results for endrin ketone and endrin aldehyde as presumptively present at an approximated quantity ("NJ").

9.4 Are data summary forms (containing calibration factors or response factors) for the initial 5 pt. calibration and daily calibration verification standards present and complete for each column and each analytical sequence? [✓] ___ ___

NOTE: If internal standard calibration procedure is used (page 8000B-16, section 7.4.2.2), then response factors must be used for %RSD calculations and compound quantitation. If, external standard calibration procedures are used (page 8000B-16, section 7.4.2.1), then calibration factors must be used.

ACTION: If any data are missing or it cannot be determined how the laboratory calculated calibration factors or response factors, contact the lab for explanation/resubmittals. Make necessary corrections and note any problems in the data assessment.

9.5 Are there any transcription/calculation errors between raw data and data summary forms. ___ [✓] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and document the effect in data assessments.

9.6 Are standard retention time (RT) windows for each analyte of interest presented on modified CLP summary forms? [ ] [✓] [✓]

RT's were stable
Exp RT & RT diff rep on form 10's

YES NO N/A

ACTION: If any data are missing, or it cannot be determined how RT windows were calculated, call the lab for explanation/resubmittals. Note any problems in the data assessment.

NOTE: Retention time windows for all pesticides are established using retention times from three calibration standards analyzed during the entire analytical sequence (page 8081B-15, section 7.4.6).

A 72 hr. sequence is not required with this method, however, the method states that best results are obtained using retention times which span the entire sequence; i.e., using the mid level from the 5 pt. calibration, one of the mid-concentration standards analyzed during mid-sequence and one analyzed at the end.

9.7 Were RT windows on the confirmation column established using three standards as described above? [ ] ___ ✓

Dual Column Sequence

NOTE: RT windows for the confirmation column should be established using a 3 pt. calibration, preferably spanning the entire analytical sequence as described in 9.6 above. If RT windows on one column are tighter than the other, this may result in false negatives when attempting to identify compounds in the samples.

ACTION: Note potential problems, if any, in the data assessment.

9.8 Do all standard retention times in each level of the initial 5 pt. calibrations for pesticides fall within the windows established during the initial calibration sequence? RT stably [✓] ___ ___

ACTION: i. If no, all samples in the entire analytical sequence are potentially affected. Check to see if three standards, spanning the entire sequence were used to obtained RT windows. If the lab used three standards from the 5 pt., RT windows

YES NO N/A

may be too tight. If so, RT windows should be recalculated as per page 8081B-15, section 7.4.6.2

ii. Alternatively, check to see if the chromatograms contain peaks within an expanded window surrounding the expected retention times.

If no peaks are found and the surrogates are visible, non-detects are valid. If peaks are present but cannot be discerned through pattern recognition or by using revised RT windows, qualify all positive results and non-detects as unusable, "R".

ACTION: For toxaphene and chlordane, the RT may be outside the RT window, but these analytes may still be identified from their individual patterns.

9.9 Has the linearity criteria for the initial calibration standards been satisfied for both columns? (% RSD must be < allowable limits* for all analytes). [✓] ___ ___

ACTION: If no, follow the actions in Table 9 below. Lab assessed curve using RF's

Table 9. Initial Calibration Linearity Criteria

Criteria	Criteria	
	Detected Associated Compounds	Non-Detected Associated Compounds
% RSD exceeds allowable limits*	J	No qualification
% RSD within allowable limits*	NO qualifications	

* %RSD ≤ 20% for single component compounds except alpha-BHC and delta-BHC.
%RSD ≤ 25% for alpha-BHC and delta-BHC
%RSD ≤ 30% for Toxaphene peaks
%RSD ≤ 30% for surrogates(tetrachloro-m-xylene and decachlorobiphenyl).

9.10 Has a calibration verification standard containing all analytes of interest been analyzed on each

YES NO N/A

working day, prior to sample analyses (pages 8081B-15, sections 7.5.2)? [✓] ___ ___

9.11 Has a calibration verification standard also been analyzed after every 10 samples and at the end of each analytical sequence (page 8081B-15, section 7.5.2)? [ ] ✓ ✓

Internal std method - see exceptions

ACTION: If no, take action as specified in section 3.2 above.

9.12 Has no more than 12 hours elapsed from the injection of the opening CCV and the end of the analytical sequence (closing CCV). Has no more than 72 hours elapsed from the injection of the sample with a Toxaphene detection and the Toxaphene CCV? [✓] ___ ___

ACTION: See Table 10 below.

9.13 Has the percent difference (%D) exceeded ± 20% for any organochlorine pesticide analyte in any calibration verification standard? ✓ [ ] ___

9.14 Has a new 5 pt. calibration curve been generated for those analytes which failed in the calibration verification standard (page 8081B-16, section 7.5.2.2), and all samples which followed the out-of-control standard (page 8081B-16, section 7.5.2.3) reinjected? [ ] ___ ✓

See Form 7 equivalent for flags

ACTION: If the %D for any analyte exceeded the ± 20% criterion and the instrument was not recalibrated for those analytes, see table below.

9.15 Have <u>daily</u> retention time windows been properly calculated for each analyte of interest (page 8081B-16, section 7.5.3)), using RTs from the associated mid concentration standard and standard deviation from the initial calibration)? [ ] ✓ ___

RTs calculated per lab method - RTs stable

CONTINUING CALIBRATION CHECK

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCECD2	Calibration:	1304047
Lab File ID:	2F4003.D	Calibration Date:	04/16/13 08:54
Sequence:	AA24376	Injection Date:	06/04/13
Lab Sample ID:	AA24376-CCV1	Injection Time:	10:28

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
4,4'-DDE	A	0.100	0.10	1.65308	1.859108		12.5	20
4,4'-DDD	A	0.100	0.097	1.000398	1.031309		3.1	20
4,4'-DDT	A	0.100	0.080	0.8654057	0.6892789		-20.4	20 * J/a

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

Flag DDT JNJ in all samples

CONTINUING CALIBRATION CHECK

EPA 8081B

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037
Instrument ID:	OSVGCECD2	Calibration:	1304047
Lab File ID:	2FB003.D	Calibration Date:	04/16/13 08:54
Sequence:	AA24452	Injection Date:	06/07/13
Lab Sample ID:	AA24452-CCV1	Injection Time:	10:28

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
4,4'-DDE	A	0.100	0.11	1.65308	2.030394		22.8	20	* J+
4,4'-DDD	A	0.100	0.091	1.000398	0.9663401		-3.4	20	
4,4'-DDT	A	0.100	0.096	0.8654057	0.8329565		-3.7	20	

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

*NQ - RE samples were not reported.

YES NO N/A

ACTION: If no, take action specified in section 3.2 above or recalculate RT windows using the procedure outlined in method 8081B-16, section 7.5.3.

9.16 Do all standard retention times for each mid concentration standard fall within the windows established during the initial calibration sequence? [ ] ___ ✓

9.17 Do all standard retention times for each mid-concentration standard (analyzed after every 10 samples) fall within the daily RT windows (page 8081B-16, section 7.5.3)? RTs stable [✓] ___ ___

ACTION: If the answer to either 9.15 or 9.16 above is no, check the chromatograms of all samples which followed the last in-control standard. All samples analyzed after the last in-control standard must be re-injected, if initial analysis indicated the presence of the specific analyte that exceeded the retention time criteria (page 8081B-18, section 7.5.7.). If samples were not re-analyzed, document under Contract Non-compliance in the Data Assessment.

Reviewer has two options to determine how to qualify questionable sample data. First option is to determine if possible peaks are present within daily retention time window. If no possible peaks are found, non-detects are valid. If possible peaks are found (or interference), qualify positive hits as presumptively present "NJ" and non-detects are rejected "R". Second option is to use the ratio of the retention time of the analyte over the retention time of either surrogate. The passing criteria is ± 0.06 RRT units of the RRT of the standard component. Reject "R" all questionable analytes exceeding criteria, and "NJ" all other positive hits.

For any multi-response analytes, retention time windows should be used but analyst and reviewer should rely primarily on pattern recognition or use option 2 specified in paragraph above.

YES NO N/A

See Table 10 below.

Table 10. CCV Criteria

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
RT out of RT window	Use professional judgement	
%D not within +/- 20%	J	UJ
Time elapsed greater than section 9.12 criteria.	R	
%D, time elapsed, RT are all within acceptable limits.	No qualifications	

9.18 Are there any transcription/calculation errors between raw data and data summary forms? ___ [✓] ___

ACTION: If large errors exists, call lab for explanation/resubmittal, make any necessary corrections and document the effect in data assessments under "Conclusions".

10.0 Analytical Sequence Check (Form VIII-PEST/Equivalent)

10.1 Have all samples been listed on CLP Form VIII or equivalent, and are separate forms present for each column? [✓] ___ ___

ACTION: If no, take action specified in 3.2 above.

10.2 Was the proper analytical sequence followed for each initial calibration and subsequent analyses? [✓] ___ ___

ACTION: If no, use professional judgement to determine the severity of the effect on the data and qualify it

YES NO N/A

accordingly. Generally, the effect is negligible unless the sequence was grossly altered or the calibration was also out of limits.

11.0 Extraction Method Cleanup Efficiency Verification (Form IX/Equivalent)

11.1 Method 8081B permits a variety of extraction techniques to be used for sample preparation. Which extraction procedure was used?

1. Aqueous samples:

1. Separatory funnel (Method 3510) ✓ Rinse blks

2. Continuous liquid-liquid extraction (Method 3520) _____

3. Solid phase extraction (Method 3535) _____

4. Other _____

2. Solid samples:

1. Soxhlet (Method 3540) _____

2. Automated Soxhlet (Method 3541) _____

3. Pressurized fluid (Method 3545) _____

4. Microwave extraction (Method 3546) _____

5. Ultrasonic extraction (Method 3550) ✓

6. Supercritical fluid (Method 3562) _____

7. Other _____

11.2 Is Form IX - Pest-1/Equivalent present and complete for each lot of Florisil/Cartridges used? (Florisil Cleanup, Method 3620A, is required for all organochlorine pesticide extracts.) [ ] ___ ___ ✓

YES NO N/A

ACTION: If no, take action specified in 3.2 above. If data suggests that florisil cleanup was not performed, make note in the reviewer narrative.

NOTE: Method 3620A uses Florisil, while the SOW/CLP allows for Florisil cartridges. Method 3620A does not list which pesticides and surrogate(s) to use to verify column efficiency. The reviewer must check project plan to verify method used as well as the correct pesticide list. If not stated or available, use the CLP listing or accept what the laboratory used.

11.3 Are all samples listed on modified CLP Pesticide Florisil/Cartridge Check Form? [ ] ___ ✓

ACTION: If no, take action specified in 3.2 above.

11.4 If GPC Cleanup was performed, is Form IX - Pest-2/ Equivalent present? [ ] ___ ✓

ACTION: If GPC was not performed and sample results indicate significant sulfur interference, make note in the data assessment.

NOTE: GPC cleanup is not required and is optional. The reviewer should check Project Plan to verify requirement.

11.5 Were the same compounds on Form IX used to check the efficiency of the cleanup procedures? [ ] ___ ✓

11.6 Are percent recoveries (% R) of the pesticide and surrogate compounds used to check the efficiency of the cleanup procedures within QC limits listed on Form IX:

80-120% for florisil cartridge check? [ ] ___ ✓

80-110% for GPC calibration? [ ] ___ ✓

YES NO N/A

Qualify only the analyte(s) which fail the recovery criteria as follows:

ACTION: If % R are < 80%, qualify positive results "J" and quantitation limits "UJ". Non-detects should be qualified "R" if zero %R was obtained for pesticide compounds. Qualify positive results "J" (estimated).

NOTE: If 2,4,5-trichlorophenol was used to measure the efficiency of the Florisil cleanup and the recovery was > 5%, sample data should be evaluated for potential interferences.

12.0 Pesticide Identification

12.1 Has CLP Form X, showing retention time data for positive results on the two GC columns, been completed for every sample in which a pesticide was detected? [✓] ___ ___

ACTION: If no, take action specified in 3.2 above, or compile a list comparing the retention times for all sample hits on the two columns.

12.2 Are there any transcription/calculation errors between raw data and data summary forms (initial calibration summaries, calibration verification summaries, analytical sequence summaries, GPC and Florisil cleanup verification forms)? ___ [✓] ___

ACTION: If large errors exist, call lab for explanation/resubmittal, make necessary corrections and note error in the data assessment.

12.3 Are retention times (RT) of sample compounds within the established RT windows for both analyses? [✓] ___ ___

Note: Confirmation can be supported by other qualitative techniques such as GC/MS (Method 8270), or GC/AED (Method 8085) if sensitivity permits.

YES NO N/A

ACTION: Qualify as unusable (R) all positive results which were not confirmed by second GC column analysis. Also qualify "R", unusable, all positive results not within RT windows unless associated standard compounds are similarly biased. The reviewer should use professional judgement to assign an appropriate quantitation limit.

12.4 Check chromatograms for false negatives, especially if RT windows on each column were established differently (see section 9.7 above). Also check for false negatives among the multiple peak compounds toxaphene and chlordane. Were there any false negatives? ___ [Y] ___

ACTION: Use professional judgement to decide if the compound should be reported. If there is reason to believe that peaks outside retention RT windows should be reported, make corrections to data summary forms (Form I) and note in data assessment.

12.5 Was GC/MS confirmation used as the second column Confirmation? (This is not required). [ ] ___ ___ ✓

12.6 Is the percent difference (%D) calculated for the positive sample results on the two GC columns ~~<25.0%~~? <40% [✓] ___ ___

NOTE: The method 8081B requires quantitation from one column. The second column is to confirm the presence of an analyte. Calibration for the Confirmation column is a one point calibration. It is the reviewer's responsibility to verify from the project plan what the lab was required to report. If the lab was required to report concentrations from both columns, continue with validation for % Difference. If required, but not reported, either contact the lab for results or calculate the concentrations from the calibration. If not required, skip this section. Document actions in Data Assessment.

See Form 10's for flags

VENO-SD07-000H

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-09RE1	File ID:	2FB023.D
Sampled:	05/17/13 10:15	Prepared:	06/06/13 12:45	Analyzed:	06/07/13 15:00
Solids:	75.70	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3F06020	Sequence:	AA24452		

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
4,4'-DDD	* 1	4.6	4.432667	0.167		0.0026	36.4
4,4'-DDD	2	4.573	4.413833	0.159		0.0018	36.4
2,4,5,6-TCMX	* 1	2.13	2.003333	0.127		0.0066	4.65
2,4,5,6-TCMX	2	2.009	1.894667	0.114		0.0063	4.65
Decachlorobiphenyl	* 1	6.166	6.021	0.145		0.0063	11.8
Decachlorobiphenyl	2	6.224	6.089167	0.135		0.0056	11.8
DBC	* 1	5.458	5.309333	0.149		0.10	0
DBC	2	5.359	5.218833	0.14		0.10	0

<4

* Column used for quantitation

VENO-SD04-000H

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-05	File ID:	2F4042.D
Sampled:	05/17/13 08:35	Prepared:	05/21/13 03:30	Analyzed:	06/04/13 18:23
Solids:	23.85	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3E21001	Sequence:	AA24376		

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
4,4'-DDE	* 1	4.16	3.951167	0.209		0.020	74.9
4,4'-DDE	2	4.151	3.944	0.207		0.0091	74.9
4,4'-DDD	* 1	4.625	4.432667	0.192		0.0083	61.4
4,4'-DDD	2	4.605	4.413833	0.191		0.0044	61.4
2,4,5,6-TCMX	* 1	2.152	2.003333	0.149		0.086	4.76
2,4,5,6-TCMX	2	2.035	1.894667	0.14		0.082	4.76
Decachlorobiphenyl	* 1	6.189	6.021	0.168		0.095	12.3
Decachlorobiphenyl	2	6.253	6.089167	0.164		0.084	12.3
DBC	* 1	5.482	5.309333	0.173		0.10	0
DBC	2	5.388	5.218833	0.169		0.10	0

* Column used for quantitation

VENO-SD04-0H01

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-06	File ID:	2F4043.D
Sampled:	05/17/13 08:20	Prepared:	05/21/13 14:30	Analyzed:	06/04/13 18:35
Solids:	31.55	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3E21021	Sequence:	AA24376		

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
2,4,5,6-TCMX	* 1	2.151	2.003333	0.148		0.029	10.9
2,4,5,6-TCMX	2	2.034	1.894667	0.139		0.026	10.9
Decachlorobiphenyl	* 1	6.189	6.021	0.168		0.036	32.3
Decachlorobiphenyl	2	6.253	6.089167	0.164		0.026	32.3
DBC	* 1	5.482	5.309333	0.173		0.10	0
DBC	2	5.388	5.218833	0.169		0.10	0

<4

* Column used for quantitation

VENO-SD05-000H

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-07	File ID:	2F4044.D
Sampled:	05/17/13 09:10	Prepared:	05/21/13 14:30	Analyzed:	06/04/13 18:47
Solids:	27.82	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3E21021	Sequence:	AA24376		

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
4,4'-DDD	* 1	4.627	4.432667	0.194		0.0072	26.8
4,4'-DDD	2	4.606	4.413833	0.192		0.0055	26.8
2,4,5,6-TCMX	* 1	2.151	2.003333	0.148		0.020	22.2
2,4,5,6-TCMX	2	2.034	1.894667	0.139		0.025	22.2
Decachlorobiphenyl	* 1	6.189	6.021	0.168		0.031	17.5
Decachlorobiphenyl	2	6.253	6.089167	0.164		0.026	17.5
DBC	* 1	5.482	5.309333	0.173		0.10	0
DBC	2	5.388	5.218833	0.169		0.10	0

* Column used for quantitation

VENO-SD06-000H

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-08	File ID:	2F4045.D
Sampled:	05/17/13 09:35	Prepared:	05/21/13 14:30	Analyzed:	06/04/13 18:59
Solids:	36.91	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3E21021	Sequence:	AA24376		

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
4,4'-DDE	* 1	4.159	3.951167	0.208		0.014	35.3
4,4'-DDE	2	4.152	3.944	0.208		0.020	35.3
4,4'-DDD	* 1	4.627	4.432667	0.194		0.15	0
4,4'-DDD	2	4.606	4.413833	0.192		0.15	0
2,4,5,6-TCMX	* 1	2.151	2.003333	0.148		0.032	0
2,4,5,6-TCMX	2	2.034	1.894667	0.139		0.032	0
Decachlorobiphenyl	* 1	6.189	6.021	0.168		0.038	8.22
Decachlorobiphenyl	2	6.253	6.089167	0.164		0.035	8.22
DBC	* 1	5.482	5.309333	0.173		0.10	0
DBC	2	5.388	5.218833	0.169		0.10	0

* Column used for quantitation

VENO-SD07-000H

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-09	File ID:	2F4046.D
Sampled:	05/17/13 10:15	Prepared:	05/21/13 14:30	Analyzed:	06/04/13 19:11
Solids:	75.70	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3E2I021	Sequence:	AA24376		

GC Column(1): Stx-CLP Pesticides. Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2. Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
4,4'-DDD	* 1	4.627	4.432667	0.194		0.0026	53.7
4,4'-DDD	2	4.606	4.413833	0.192		0.0015	53.7
2,4,5,6-TCMX	* 1	2.151	2.003333	0.148		0.0098	9.63
2,4,5,6-TCMX	2	2.034	1.894667	0.139		0.0089	9.63
Decachlorobiphenyl	* 1	6.189	6.021	0.168		0.015	6.9
Decachlorobiphenyl	2	6.253	6.089167	0.164		0.014	6.9
DBC	* 1	5.482	5.309333	0.173		0.10	0
DBC	2	5.388	5.218833	0.169		0.10	0

J

* Column used for quantitation

VENO-SD07P-000H

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	ENCO Orlando	SDG:	A302870-CTO0037
Client:	CH2M Hill, Inc. (CH029)	Project:	East Vieques La Chiva SWMU 1, CTO-0037

Matrix:	Sediment	Laboratory ID:	A302870-10	File ID:	2F4047.D
Sampled:	05/17/13 10:15	Prepared:	05/21/13 14:30	Analyzed:	06/04/13 19:23
Solids:	76.16	Preparation:	EPA 3550C	Instrument:	OSVGCECD2
Batch:	3E21021	Sequence:	AA24376		

GC Column(1): Stx-CLP Pesticides, Diam:0.32mm, Le GC Column(2): Stx-CLP Pesticides2, Diam:0.32mm, Len:30m

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
4,4'-DDE	2	4.152	3.944	0.208		0.0015	200 N1
4,4'-DDD	* 1	4.627	4.432667	0.194		0.0025	63.2 J
4,4'-DDD	2	4.606	4.413833	0.192		0.0013	63.2
2,4,5,6-TCMX	* 1	2.152	2.003333	0.149		0.013	8
2,4,5,6-TCMX	2	2.035	1.894667	0.14		0.012	8
Decachlorobiphenyl	* 1	6.19	6.021	0.169		0.017	12.5
Decachlorobiphenyl	2	6.253	6.089167	0.164		0.015	12.5
DBC	* 1	5.482	5.309333	0.173		0.10	0
DBC	2	5.388	5.218833	0.169		0.10	0

* Column used for quantitation

YES NO N/A

ACTION: If the reviewer finds neither column shows interference for the positive hits, the data should be qualified as follows:

% Difference	Qualifier
0-25%	none
26-70%	"J"
71-100%	"NJ"
101-200% (No Interference)	"R"
101-200% (Interference detected) "NJ"	
>50% (Pesticide vale is <CRQL)	"U"
>201%	"R"

Note: The lower of the two values is reported on Form I. If using professional judgement, the reviewer determines that the higher result was more acceptable, the reviewer should replace the value and indicate the reason for the change in the data assessment.

13.0 Compound Quantitation and Reported Detection Limits

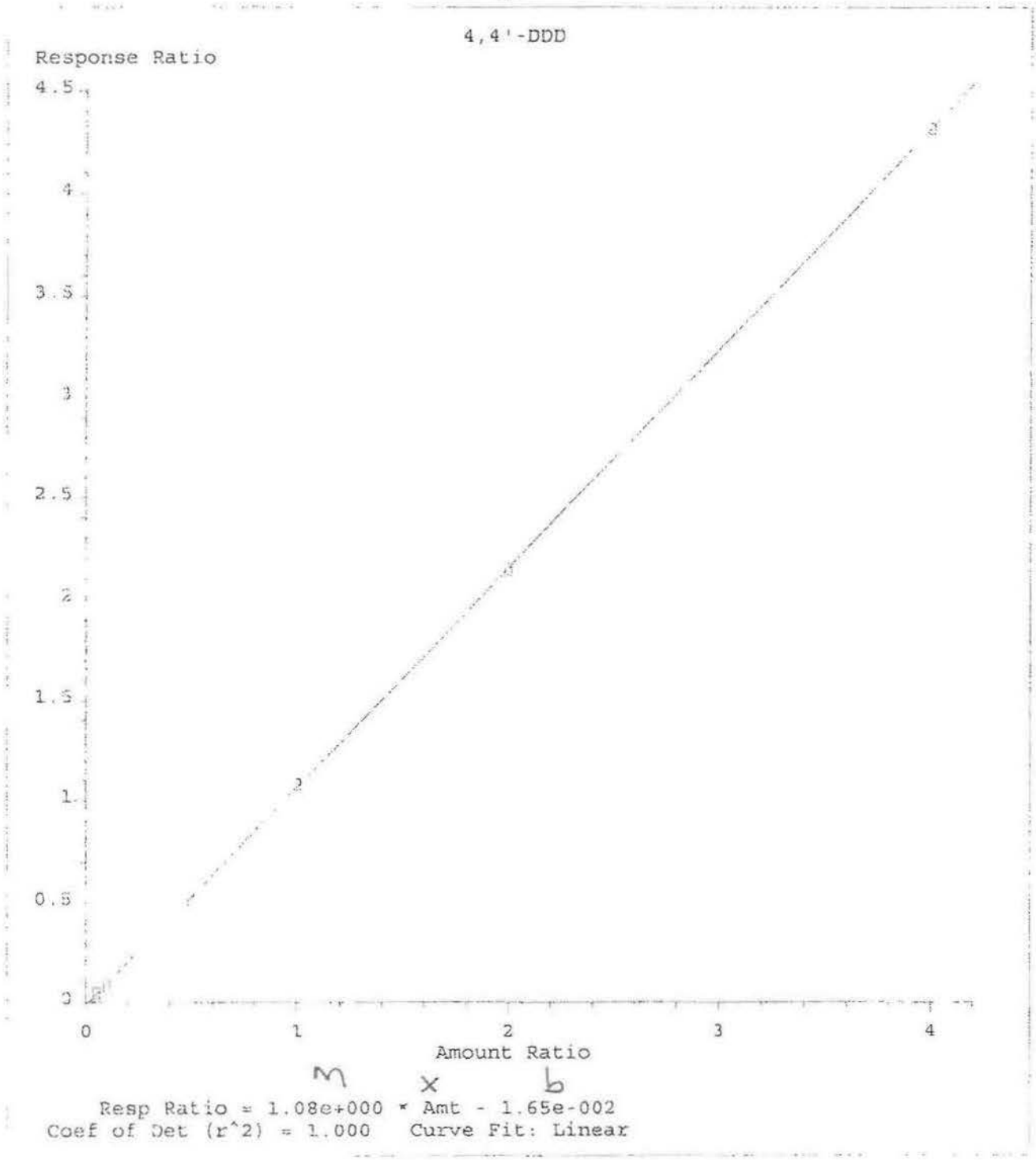
13.1 Are there any transcription/calculation errors in Form I results? Check at least two positive values. Were any errors found? ___ [✓] ___

NOTE: Single-peak pesticide results can be checked for rough agreement between quantitative results obtained on the two GC columns. The reviewer should use professional judgement to decide whether a much larger concentration obtained on one column versus the other indicates the presence of an interfering compound. If an interference is suspected, the lower of the two values should be reported and qualified according to section 12.6 above. This necessitates a determination of an estimated concentration on the confirmation column. The narrative should indicate that the presence of interferences has led to the quantitation of the second column confirmation results.

210

Sample ID A302870-05 (VENO-SD04-000H) DF 2

4,4'-DDD 0.0083 mg/kg Area Counts: 8799486



Method Name: Z:\2\METHODS\PEST2DJ13.M
Calibration Table Last Updated: Wed Jul 10 09:45:27 2013

$$Amt = \left(\frac{DDD_A}{Int_A} - b\right)\left(\frac{Int\ conc}{m}\right) = 0.0030\ \cancel{ug/ml}\left(\frac{10\ \cancel{ml}}{30.3\ g}\right)\left(\frac{2}{0.2385}\right)$$

$$= 0.0083\ mg/kg$$

YES NO N/A

13.2 Are the EDLs (Estimated Detection Limits) adjusted to reflect sample dilutions and, for soils, % moisture? [✓] ___ ___

ACTION: If errors are large, call lab for explanation/resubmittal, make any necessary corrections and document effect in data assessments.

ACTION: When a sample is analyzed at more than one dilution, the lowest EDLs are used (unless a QC exceedance dictates the use of the higher EDL data from the diluted sample analysis). Replace concentrations that exceed the calibration range in the original analysis by crossing out the value on the original Form I and substituting it with data from the analysis of diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's that should not be used, including any in the summary package.

ACTION: EDLs affected by large, off-scale peaks should be qualified as unusable, "R". If the interference is on-scale, the reviewer can provide a modified EDL flagged "UJ" for each affected compound.

14.0 Chromatogram Quality

14.1 Were baselines stable? [✓] ___ ___

14.2 Were any electropositive displacement (negative peaks) or unusual peaks seen? ___ [✓] ___

ACTION: Note all system performance problems in the data assessment.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for organochlorine pesticide analysis? [✓] ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the reviewer narrative. However, if large differences exist, the identity of the field duplicates is questionable. An attempt should be made to determine the proper identification of field duplicates.

Jacqueline Cleveland

From: Marcia Colon <mcolon@encolabs.com>
Sent: Thursday, July 11, 2013 12:43 PM
To: 'Jacqueline Cleveland'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides
Attachments: A302428 REV 8081B.pdf; A302857 REV 8081B.pdf; A302870 REV 8081B.pdf; CTO-037 _Attachment 3 Self-Declaration_La Chiva Lab_FINAL_Signed.pdf; EPA 8081B Calculation.pdf

Hi Jackie-
I have all the information for you. I added in your other 2 email requests to your individual email so I could respond to all the questions/comments.

See my response below. If you need anything else just let me know ☺.

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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ENCO is an eco-friendly lab offering paperless service options, please contact me anytime with questions.

From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, July 09, 2013 5:49 PM
To: 'Marcia Colon'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: Laguna La Chiva Pesticides

Hello Marcia,

I have a couple of issues with the pesticides data packages submitted for the CH2M HILL Laguna LaChiva project. SDG numbers affected by this request are A302857, A302870 & A302428.

Questions:

*The continuing calibration check standards do not reflect accurate %Ds based on the response factor values presented. For example: see page 955 in SDG A302857. The RRF for DDE in the ICAL is listed as 165.308 and the RRF for DDE in the CCV is listed as 1.859108. These values are not comparable. There are two form 6 equivalents in the data package and they reflect RRFs that appear to have been calculated two different ways. The CCV forms must reflect RRFs that were consistently calculated. Please look in to this issue and resubmit the CCV forms (form 7 equivalents) to reflect consistent RRFs and correct %Ds.

The wrong internal ID number was included in the curve data. The analyst had corrected this error but didn't let me know, I had already run the data package and so the wrong information was included on the CCV forms. I have rerun the FORM1s for EPA 8081B and the correct RF is included.

*I am not finding closing CCVs for the analytical sequences. Please submit closing CCVs for all sequences to include summary forms and raw data.

I have attached a copy of the attachment 3 where we include our exception that we report using internal standardization.

*Generally column quantitation %RPDs are reported on a form that includes the quantitated value from both columns. The submitted forms does not include both of the quantitated values. Please comment on this to include an explanation of which value you are reporting (highest or lowest quantitated values).

I have rerun the FORM1s, the dual column forms not show both the primary and second column values. I have discussed this with the analyst and from now on we will make sure we report both columns.

Thank you for your help!

Jackie

I have one additional question regarding the pesticides SDGs. When attempting to reproduce the quantitation calculations from raw area I am unable to calculate the values reported on the quantitation pages. However, I am able to produce the reported results from the ug/ml value present on the quantitation pages. Please provide a calculation example that walks me through your quantitation process from raw area counts for one reported positive result for a target compound. Thank you!

The analyst wrote out the calculation and a copy of this has been included.

Thanks for letting me know you are working on the requests. I have an additional question about the pesticides. It looks like the submitted surrogate recovery forms do not include recoveries for both surrogates/columns. For example, there is only one TCMX recovery and one DCB recovery for sample VENO-SD11-000H. Generally, recoveries are reported from both columns for all samples. Please update these forms to include all recoveries for the surrogate compounds. Thank you!

The FORM1s have been rerun. The surrogates & internals have been reported from both columns. Again, I will make sure we start reporting both columns.

Jacqueline Cleveland
Vice-President
DataQual, ES, LLC

636-352-9391
cleve137@charter.net

Jacqueline Cleveland

From: Marcia Colon <mcolon@encolabs.com>
Sent: Monday, July 15, 2013 12:23 PM
To: 'Jacqueline Cleveland'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides
Attachments: EPA 8081B(AA23829) CURVE PLOTS.PDF

Sorry Jackie-
I meant to send the plots along with me email.

Here you go ☺

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Monday, July 15, 2013 12:26 PM
To: Marcia Colon
Cc: DataQual; <Juliana.Dean@ch2m.com>
Subject: Re: Laguna La Chiva Pesticides

Hi Marcia,

I understand and have information for both curve processing methods. However the calculation example provided by the analyst quanted against the LR curve. That is fine but if all of the quantitation is performed against the LR curves then I need the curve plots for all of the target compounds & surrogates. Will you send those to me please. The only one she sent was for the example, I think it was DDE. Thanks.

Jackie

Sent from my iPhone

On Jul 15, 2013, at 10:41 AM, "Marcia Colon" <mcolon@encolabs.com> wrote:

<image002.jpg>
Hi Jackie-
ENCO analyzes both EPA 8081B and EPA 608 samples, in speaking with the Organics Manager he said that the analyst that processed the curve was using EPA 608 criteria and chose to use linear regressions to meet the 608 criteria, when he did this he did not print out the plots to be included with the curve data. Because we analyze EPA 608 and EPA 8081B samples we process the curve twice, once processed against EPA 608 criteria and then against EPA 8081B criteria. In this case the analyst did not do that, he just processed the curve against the EPA 608 criteria. The curve did meet all the EPA 8081B criteria to report all analytes against response factor.

If you need anything else please let me know.

Thanks!!

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Thursday, July 11, 2013 8:30 PM
To: 'Marcia Colon'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides

Marcia,

Thank you for providing answers/resubmission in response to my request. Based on your response regarding the calculation example it looks like all of your quantitation was performed against the plotted linear regression curves. If that is the case I need you to send me the rest of the curve plots. The analyst sent the plot for DDE as part of her example calculation but she didn't send the other target compounds or the surrogate compounds. It also looks like the continuing calibrations were assessed by comparing the response factors and not for the calculated amounts (%D vs %Drift). Generally if

quantitation is performed via the LR curves the expectation is that %Drifts would be reported. The values are similar and the difference between them will not likely affect the data. I just need a statement as to the labs general practice. Thank you for your help!

Jackie

From: Marcia Colon [mailto:mcolon@encolabs.com]
Sent: Thursday, July 11, 2013 12:43 PM
To: 'Jacqueline Cleveland'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides

Hi Jackie-
I have all the information for you. I added in your other 2 email requests to your individual email so I could respond to all the questions/comments.

See my response below. If you need anything else just let me know ☺.

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Tuesday, July 09, 2013 5:49 PM
To: 'Marcia Colon'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: Laguna La Chiva Pesticides

Hello Marcia,

I have a couple of issues with the pesticides data packages submitted for the CH2M HILL Laguna LaChiva project. SDG numbers affected by this request are A302857, A302870 & A302428.

Questions:

Jacqueline Cleveland

From: Marcia Colon [mcolon@encolabs.com]
Sent: Tuesday, July 16, 2013 11:48 AM
To: 'Jacqueline Cleveland'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides
Attachments: EPA 8081B LR CURVE PLOTS.pdf

Hi Jackie-
Enclosed are the 3 additional curve plots.

Thanks!!

Marcia Colon
Project Manager

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive
Orlando, FL 32824
(407)826-5314 ph
(407)850-6945 fax
mcolon@encolabs.com

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From: Jacqueline Cleveland [mailto:cleve137@charter.net]
Sent: Monday, July 15, 2013 8:05 PM
To: 'Marcia Colon'
Cc: 'DataQual'; Juliana.Dean@ch2m.com
Subject: RE: Laguna La Chiva Pesticides
Importance: High

Marcia,

I was working on my calculations tonight and noticed that the pdf file you sent me doesn't contain the curve plots for DDT or either surrogate compound. Will you send those over please? I was hoping to send the DVR to CH2M tomorrow! Thank you!

Jackie

From: Marcia Colon [mailto:mcolon@encolabs.com]
Sent: Monday, July 15, 2013 12:23 PM
To: 'Jacqueline Cleveland'

220

Appendix F
Final Responses to Agency Comments

Final Responses to

EPA Comments on the

Draft No Action Decision Document Laguna La Chiva

Atlantic Fleet Weapons Training Area—Vieques
Former Vieques Naval Training Range
Vieques, Puerto Rico

February 2014

Presented below are review comments on the *Draft No Action Decision Document, Laguna La Chiva, Former Vieques Naval Training Range, Vieques, Puerto Rico;* dated February 2014 (hereinafter referred to as the Decision Document).

General Comments

1. On March 2012, EPA learned that a contractor working on the construction of the new bridge for Playa La Chiva area removed soil and sediment from Laguna La Chiva. The soil and sediment was placed on a location to the north side of the road, inland La Chiva area. See attached picture. The Decision Document makes no mention of this event. The soil and sediment pile has not been investigated, so there is no knowledge is there is an unacceptable risk from this pile that originated from the Laguna La Chiva site. Please document the removal of soil and sediment from Laguna La Chiva site in the Decision Document and explain how the Navy will address the risk uncertainty to support the no action decision.

   Navy Response:

   Representatives of the EPA, EQB, FWS, NOAA, and Navy jointly selected the sampling locations to be representative of the lagoon as a whole, including the area where sediment was dredged for the bridge refurbishment. There is no more uncertainty in applying the conclusions of the study to the sediment from that area of the lagoon than any other area of the lagoon. Further, because the sediment has been removed from the lagoon, decisions made for the lagoon are not affected by the sediment that is no longer located there.

   The following text has been added as the last paragraph of Section 2.1: "In 2012, during refurbishment by USFWS of the bridge along Route 104 where it crosses Laguna La Chiva, soil from the bank with some sediment from the southern arm of the lagoon was dredged and stockpiled west of Laguna La Chiva. The dredging did not take place in the area where sediment samples containing elevated pesticide concentrations were collected by NOAA."

   In addition, the last sentence of the Step 7 paragraph in Section 2.4 has been revised to read (new text underlined): "Based on this information, the spatial distribution of the samples collected at Laguna La Chiva and the resulting data indicate that the potential source areas were sufficiently sampled <u>and the data are representative of the lagoon surface water and sediment as a whole. Further, the information collected during historical sampling by NOAA, observations made during the SI (i.e., absence of source area), and analytical results of SI sampling throughout and adjacent to Laguna La Chiva indicate the data are also representative of the dredged soil/sediment."</u>

In addition, the last sentence of Section 2.5 has been revised to read (new text underlined): "Therefore, no action is warranted for Laguna La Chiva <u>or the dredged soil/sediment associated with the bridge refurbishment. However, should the dredged soil/sediment be identified for re-use, it will be characterized in accordance with the planned re-use."</u>

2. The Decision Document states that the overall completeness goal of 95% was not met for sediment semi-volatile organic compounds (SVOCs). However, the Decision Document does not sufficiently address the data gap created by these rejections (i.e., since all rejections were from the same area, it does not appear that SVOC contamination has been assessed in the area of the lagoon near samples SD04, SD05, and SD06). Based in the information provided in the Decision Document, it appears that additional sampling is required to address these data gaps. Alternatively, the Decision Document should be revised to discuss the data gap caused by the missed completeness goal and provide sufficient justification (e.g., historical SVOC data collected in the areas of SD04, SD05 and SD06; the samples in this area were subject to laboratory cleanups [specify which cleanups were performed] and still gave poor surrogate recoveries and this is likely to occur with any resamples; etc.) to support the conclusion that no action is needed.

Navy Response:

The Step 2 paragraph in Section 2.4 has been revised to read: "The raw . . . Based on the evaluation of SI data, the 95% goal was met for each combination of matrix and analysis group with the exception of sediment SVOCs where 79.5% completeness was obtained. A total of 20.5% of the SVOC sediment data were R-qualified as "rejected" due to low recovery of a surrogate spike which is used to ensure target compounds are accurately recovered during the analytical process. The low recovery indicates there is a potential low bias due to matrix interference. Three of the 12 sediment stations (SD04, SD05, and SD06) were affected, comprising samples VENO-SD04-000H, VENO-SD04-0H01, and VENO-SD05-000H, and VENO-SD06-000H. However, a number of SVOCs were still reportable (i.e., not rejected) in sample VENO-SD04-000H as non-detect. In addition, the 12 remaining sediment samples (representing 9 stations throughout the lagoon) had acceptable surrogate spike recoveries, and very significantly, SVOCs were non-detect for all results. In addition, PAHs detected in Laguna La Chiva sediment samples collected by NOAA, including in the vicinity of samples SD04, SD05, and SD06, were up to orders of magnitude below NOAA's toxicological values and ecological and human health screening values used for Vieques sites. Further, there is no known or suspected source of an SVOC release to the lagoon; SVOC analysis was simply included because it had not been included in past sampling. Based on the above information, the rejected data do not represent a data gap that inhibits drawing conclusions and making determinations for Laguna La Chiva. Further, because the rejected results were due to matrix interferences, which is common in samples from settings such as Laguna La Chiva, additional samples from the area would likely result in similar matrix interferences. Therefore, the dataset as a whole is available and useful for the intended purpose of meeting the study objectives and making site-specific determinations."

Note that laboratory cleanups are not performed for SVOCs, as these analytes are reactive and not likely to withstand cleanup procedures.

3. Section 2.3.1 (Physical Characteristics) of the Decision Document does not adequately describe all of the physical features and meteorological conditions at the site that may affect contaminant transport. EPA guidance document *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA,* EPA/540/G-89/004, October 1988 [RI/FS guidance] indicates that a contaminant migration pathway analysis be conducted and this analysis include a complete description of the physical features and meteorological conditions at the site. Section 3.2.2.1 (Surface Features) of the RI/FS guidance states "[S]urface features may include facility dimensions and locations (buildings, tanks, piping, etc.), surface

disposal areas, fencing, property lines and utility lines, roadways and railways, drainage ditches, leachate springs, surface-water bodies, vegetation, topography, residences, and commercial buildings. Features such as these are usually identified for possible contaminant migration and the location of potentially affected receptors. Investigation of surface features should not be limited to those that are onsite, but should include significant offsite features as well." As such, noted deficiencies in descriptions of the physical characteristics of the Laguna La Chiva site in the Decision Document include the following:

- Section 2.3.1 states that that the hydrologic connection to the Caribbean Sea at the southern end of the lagoon is blocked by a large sand pile. Information pertaining to how the sand pile affects water levels and movement of water into and out of the lagoon considering tidal influences and storm events should be provided to better understand the extent to which this land feature may affect contaminant movement and distribution at the lagoon. Provide additional information about the size of the sand pile relative to the lagoon and indicate whether this sand pile impedes all movement of water from the lagoon to the sea, including during storm events, so that the extent to which this land feature may affect physical processes and contaminant migration at the lagoon is sufficiently described.
- Descriptions of land topography and slopes, and information about whether other drainage channels or creeks exist other than the two identified ephemeral streams, has not been adequately discussed. The Decision Document should be revised to provide additional information about the topography of the site and all potential water transport channels to better understand all potential contaminant migration pathways at the site.
- The size and location of the two ephemeral streams in relation to the Solid Waste Management Unit (SWMU) 1 has not been adequately discussed. The Decision Document should be revised to provide additional detailed information about the size and location of the streams relative to SWMU 1 so that the extent to which the ephemeral streams may influence contaminant migration from the SWMU 1 to downgradient locations in the Laguna La Chiva lagoon can be assessed.
- Information about the size (approximate dimensions) of the SWMU 1, what known or suspected waste may be located at this site, and what known or suspected contaminants remain at this site has not been discussed. The Decision Document should be revised to include this information.
- Information pertaining to the meteorological data (such as annual rainfall or average frequency of significant storm events affecting the lagoon) has not been discussed and should be provided so that environmental factors that may influence contaminant migration can be assessed.

Revise the Decision Document to address the noted deficiencies with respect to descriptions of land features, environment factors, and meteorological conditions that have the potential to affect contaminant migration pathways.

Navy Response:

Topographic contours and ephemeral streams have been added to Figure 1-2. In addition, the following text has been added to Section 2.3.1 Physical Characteristics:

> "The climate of Vieques is characterized as warm and humid (tropical-marine). Temperatures are nearly constant with an annual average temperature of about 79 °F; August is the warmest month, with an average temperature of 82 °F and February the coolest, with an average temperature of 76 °F. Vieques lies in the path of the prevailing easterly trade winds, regulating the climate. The trade winds result in a rainfall pattern characterized by a dry season from December through April and a rainy season from May through November. Due to tropical low pressure systems carried by the trade winds, heavy precipitation results from tropical storms

and occasional hurricanes from July to November. The island's average rainfall is approximately 36 inches, with extremes of 25 inches in the east and 45 to 50 inches in the west.

Laguna La Chiva is an approximately 10-acre estuarine lagoon located in a low-lying area at an elevation less than 3 ft above mean sea level (Figure 1-2). Two ephemeral streams drain into the lagoon. Under current (normal) conditions, the hydrologic connection to the Caribbean Sea at the southern end of the lagoon is blocked by a large accumulation of sand at Playa La Chiva, and this appears to be a well-established barrier to the sea that is infrequently breached by strong storm events, as evident through time on historical aerial photographs. The lagoon water level varies based on the amount of precipitation."

In addition the above, the following text was added after the first sentence in Section 2.3.2. "As discussed in Section 2.2.4, an RI was conducted at SWMU 1 to evaluate the nature and extent of contamination and the potential for contaminants to migrate downgradient of the site within the ephemeral streams. The RI/FS Report provides detail description of SWMU 1 and concluded that there was no evidence of contamination from the SWMU being transported along the ephemeral streams (CH2M HILL, 2011)."

4. The Appendix B Data Quality Evaluation (DQE) Precision, Accuracy, Representativeness, Completeness and Comparability (PARCC) evaluation is insufficiently detailed because the DQE PARCC evaluation does not discuss whether the data exhibited any trends or bias that may impact project decisions. The *Draft Sampling and Analysis Plan, Laguna La Chiva Site Inspection/Remedial Investigation,* July 2012 (SAP) Worksheet #37 states that biases will be evaluated and also states, "the distribution of applied data validation qualifiers will be examined to determine if there are patterns that negatively affect the usability of data." However, overall biases and patterns in qualified data are not discussed in the DQE PARCC evaluation. It is noted that Section 2.4 (Laguna La Chiva Release Assessment Decision Analysis) describes a potential low bias in the SVOC analysis of sediment, but this discussion is not included in Appendix B. Revise the DUE PARCC evaluation to discuss whether trends and biases were noted in the data as a result of this evaluation.

Navy Response:

Please refer to responses to EPA Specific Comments #4 and #5, below. The potential low bias in the SVOC analysis of sediment is discussed in Appendix B section B.2.2 and B.3.2.

5. The Decision Document presents inconsistent information on data that was rejected as a result of data validation. For example, the text of Appendix B indicates that only SVOC data were rejected, however, the data validation reports (DVRs) in Appendix E indicate that VOC data was also rejected. Revise the Decision Document to consistently discuss the data that were rejected.

Navy Response:

For sample data from Laguna La Chiva, only some SVOC data were rejected. The VOC data shown as rejected in Appendix E are for equipment blanks and trip blanks, not field matrix (i.e., surface water and sediment) samples. The DQE discusses the appropriate data quality and, therefore, the Decision Document is consistent as written.

6. Appendix D (Ecological Risk Assessment) does not consistently define how reptiles are evaluated in the ecological risk assessments (ERAs). Section 1.2.3 (Conceptual Site Model) indicates that potentially complete exposure pathways are available for terrestrial reptiles, whereas Figure D-2, Ecological Conceptual Site Model, includes both terrestrial and aquatic reptiles as receptors that will not be evaluated quantitatively. However, Table D-4 (Assessment Endpoints, Risk Hypotheses, and

Measurement Endpoints) indicates that chemical concentrations in soil will be compared to screening values for terrestrial reptiles (i.e., a quantitative assessment). Also, this table does not indicate how aquatic reptiles will be evaluated. Finally, Section 1.5.4 (Risk Evaluation) does not mention reptiles at all. Amend Appendix D to consistently present how the reptiles will, or will not, be assessed.

Navy Response:

These Appendix D comments have been addressed as follows:

- Section 1.2.3 accurately indicates that only terrestrial (not aquatic) reptiles are potentially exposed. The following has been added to the end of the second paragraph in the "Exposure Pathways and Routes" subsection: "Since Laguna La Chiva is a saltwater lagoon, there is no complete aquatic exposure pathway to amphibians which require freshwater for egg laying and growth of tadpoles."
- Figure D-2 has been revised to remove aquatic reptiles as receptors.
- In Table D-4, the measurement endpoint for reptile direct exposure has been changed to "Due to limited toxicological information for reptiles, comparison of maximum (SERA) and mean (BERA) chemical concentrations in surface soil with soil screening values for other terrestrial biota (plants and soil invertebrates)."
- In Section 1.5.4, Terrestrial Habitats, the last sentences of paragraphs 2 and 3 were replaced with the following sentences, respectively:

"Thus, considering that the maximum (and only) detected concentration of DDE in soil around Laguna La Chiva is within the range of concentrations detected in soil on Vieques and attributed to normal pesticide use, DDE was not identified as a COC for directly exposed plants, invertebrates, and reptiles."

"Thus, considering the low range of HQs, conservativeness of the food web model, and soil concentration within the range of concentrations detected in soil on Vieques and attributed to normal pesticide use, DDE was not identified as a terrestrial food web COC (that is, for birds, mammals, and reptiles)"

Specific Comments

1. **Section 2.2.4, SWMU 1, Page 2-3:** In this section Figure 2-3 (SWMU 1 Ephemeral Stream Soil Samples) is listed as depicting the surface and subsurface soil sample results from depositional areas within two ephemeral streams upgradient of Laguna La Chiva. However, the residential Regional Screening Levels (RSLs) presented in the upper right hand corner of the figure are from May 2012, which is outdated. Update Figure 2-3 to depict the most recent RSLs from November 2013 (posted to the RSL website in December 2013) and revise the text if subsequent changes are required.

   Navy Response:

   The Figure has been modified to include the May 2014 RSLs.

2. **Section 2.4, Laguna La Chiva Release Assessment Decision Analysis, Page 2-7:** Under the subheading, Human Health Risk Assessment, there are discrepancies between the receptors listed in the text and those listed in Appendix C (Human Health Risk Assessment). In order to maintain consistency, revise the list of receptors in Section 2.4 to the following: "Current/Future Recreational Users/Trespassers/Site Visitors", "Future Residents", "Future Maintenance Workers/Industrial Workers/Construction Workers" and "Current/Future Fish and Blue Crab Consumers."

Navy Response:

The receptors listed in the text match those presented in Appendix C with the exception of the current or future designation. Therefore, the list of receptors in Section 2.4 has been revised as follows:

- Current/Future Recreational Users/Trespassers/Site Visitors
- Future Residents
- Future Maintenance Workers/Industrial Workers/Construction Workers
- Current/Future Fish and Blue Crab Consumers

3. **Appendix B, Section B.0.5.4, Concentration Ranges for Sediment VOAs and SVOAs, Page 1-7:** The third paragraph in this section states that forty-two (42) out of sixty-six (66) analytes shown in Table B-1 were shaded because the maximum U-Value exceeded the screening level (SL). However, it appears only fifty-eight (58) analytes are listed in Table B-1 rather than sixty-six (66). Revise this statement, or revise Table B-1 to list the additional analytes with detection limits greater than the SL.

Navy Response:

There are only 58 analytes (not 66) where at least one nondetect U-value exceeded a SL. DQE section B.0.5.4 paragraph three has been updated to refer to "42 shaded rows out of 58 analytes shown on Table B-1."

4. **Appendix B, Section B.3.1, Precision, Page 1-10:** This section states that there was no negative impact on precision because no data points were deemed unusable (rejected) due to precision exceedances; however, this section does not describe the number of results that were qualified for precision nonconformances or whether any trends related to precision were noted in the data. For instance, an assessment of precision may include evaluation of items such as: 1) whether field duplicate nonconformances were noted to occur in one matrix or for one parameter (VOCs, SVOCs, and pesticides); and 2) whether precision nonconformances were noted to occur when other analytical problems were encountered or whether the precision problems were deemed a result of matrix interference or sample heterogeneity and not related to analytical nonconformances. Revise this section to provide a more detailed analysis of how and when precision nonconformances occurred, and what that information may indicate about the sample matrix or analytical performance, trends or biases, and the overall reliability of the results.

Navy Response:

It is true that no data points were deemed unusable due to precision exceedances. Furthermore, very few results (0.216% of the total) were qualified (and still available for use) due to precision exceedances as evidenced by field duplicate and dual-column reproducibility. Starting at the end of section B.3.1, additional sentences were added:

"Minor precision exceedances were noted. Please refer to Table B-2. Three detections were J-qualified as "estimated" and one nondetect was UJ-qualified as "nondetect, estimated reporting limit" due to field duplicate relative percent difference exceeding 30%. Affected analytes were 2-Butanone; 4,4'-DDD; and 4,4'-DDE. Because they are noted via the field duplicate, these are likely the result of matrix heterogeneity and not associated with analytical non-conformances. One detection (4,4'-DDD in VENO-SS05-0002) was U-qualified as "not detected" due to dual-column reproducibility because the data validator determined that the detection was not confirmed. These

minor precision exceedances do not affect the overall reliability of the results because the affected (qualified but not rejected) results are available for use by the project team."

5. **Appendix B, Section B.3.2, Accuracy, Page 1-10 and 1-11:** The discussion of Accuracy lacks sufficient detail because it does not discuss whether trends or biases were noted in any portion of the data. Additionally, this section states that there is a negative impact on accuracy due to QC exceedances because a significant number of data points were deemed unusable (rejected) due to surrogate spike recovery exceedances but does not describe what impact this has on the data set. Revise the discussion of accuracy to further discuss what impact these nonconformances may have on the data. Additionally, revise this section to discuss whether trends or biases may exist based on the evaluation of accuracy indicator QC samples, and what the results of the accuracy assessment indicates about the reliability of the data.

Navy Response:

The effect of rejected nondetect SD SVOCs data on the data set is discussed in Section B.2.2 (referred-to by section B.3.2). The following additional paragraph was added to the end of Section B.3.2:

"Minor accuracy exceedances were also noted, as shown in Table B-2. In addition to the rejected results discussed above, 463 results were J-qualified as "estimated" or UJ-qualified as "nondetect, estimated reporting limit" due to low spiked surrogate recovery. This comprised 63 pesticides results, 196 SVOC results, and 204 VOC results and is likely a result of matrix effects because the surrogate QC is sample-specific and confirmed by reanalysis. Although this may indicate a potential low bias, the exceedance is not severe enough to warrant rejection, and thus this does not affect the availability or reliability of the data. Twenty one nondetect results were UJ-qualified due to high recovery in the continuing calibration and 12 nondetect results were UJ-qualified due to high recovery in the initial calibration. Because this may indicate a potential high bias associated with nondetect data, the results are qualified simply to indicate that an exceedance has occurred, and there is no effect on the usability of the data set. A very small amount of data (four nondetects and one detection, all for pesticides) were UJ- or J-qualified due to low recovery in a continuing calibration. Continuing calibration exceedances may be due to analytical effects but can also be due to matrix effects. Although these minor accuracy exceedances may indicate a potential low bias, they do not affect the overall reliability of the results because the affected (qualified but not rejected) results are available for use by the project team."

6. **Appendix D, Section 1.6, Uncertainties, Page 1-20:** The last paragraph on this page (Food Web Exposure Modeling) indicates that modeled tissue concentrations in insects that are consumed by the insectivorous bats and birds are likely conservative for metals and explosives. However, the chemicals analyzed at Laguna La Chiva are organochlorine pesticides, VOCs, and SVOCs. Revise this section to discuss the uncertainty in estimating the modeled insect tissue concentrations of pesticides, VOCs, and SVOCs.

Navy Response:

The referenced paragraph has been replaced with the following: "There is a high degree of uncertainty in estimating chemical concentrations in the tissues of aerial insects that are consumed by insectivorous bats (free-tailed bat) and birds (cave swallow) using standard invertebrate uptake models, which typically do not consider the emergent forms of invertebrates. As a result, the concentrations of lipophilic chemicals (i.e., organochlorine pesticides, VOCs, and SVOCs) estimated in emergent insects may be overestimated or underestimated in the food web evaluations."

7. **Appendix D, Table D-4, Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints, Page 1 of 3:** The second measurement endpoint for terrestrial reptiles states that this receptor group is evaluated by using both mammals and birds as surrogates. This approach, however, does not appear to be discussed in the ERA. Discuss the evaluation of reptiles through this surrogate receptor group, or revise Table D-4 and the text if reptiles are not included in the risk evaluation.

Navy Response:

Table D-4 and the text were revised as discussed in the response to EPA General Comment #6.

Final Responses to PREQB Comments of the

Draft No Action Decision Document for Laguna La Chiva

Atlantic Fleet Weapons Training Area—Vieques
Former Naval Ammunition Support Detachment
Vieques, Puerto Rico

Page-Specific Comments

1. **Page 2-2, Section 2.2.3:**

   a. **Bulleted List:** Please add text to each chemical group indicating whether the chemicals discussed were considered site-related or were determined not to be site-related, consistent with the discussion for PAHs. This additional information is needed to support the last paragraph of this section which identifies those chemicals not considered further.

   Navy Response:

   PAHs were not eliminated from consideration based on whether they were site-related. As stated in the PAH bullet of Section 2.2.3, PAHs were eliminated from further consideration because all detected concentrations were below risk-based screening values. The last sentence of Section 2.2.3 has been revised as follows: "Pesticides (other than DDD, DDE, and DDT), PCBs, PAHs, butyltins, explosives, and metals were eliminated by the ERP Technical Subcommittee as potential contaminants of interest for further evaluation because they were either not detected or were detected below ecological and human health risk-based screening levels."

   b. **First Bullet:** Please clarify this statement, "Concentrations variously exceeded ecological screening levels." This statement could be construed as various concentrations exceeded ecological screening levels or concentrations exceeded various ecological screening criteria. Please clarify and revise the statement accordingly.

   Navy Response:

   The statement has been revised as follows: "Concentrations of DDT and DDD exceeded their respective ecological screening levels in all three samples, while DDE exceeded its ecological screening level in two samples."

   c. **Butyltins:** Please correct spelling of tributytlin in the first sentence.

   Navy Response:

   The spelling has been corrected to tributyltin.

2. **Page 2-7, Section 2.4, Human Health Risk Assessment:** Please consider revising Section 2.3.3 for consistency with the list of receptors presented in this section. Note that residential land use is not discussed in Section 2.3.3 yet a resident is evaluated in the human health risk assessment.

   Navy Response:

   The following text has been added after the fourth sentence of the first paragraph of Section 2.3.3 and at the end of the first paragraph under "Human Health Risk Assessment" in Step 6 of Section 2.4:

"Although the site will not be developed for residential use, a residential scenario was included in the HHRA to evaluate the unrestricted land use scenario."

3. **Page 2-9, Section 2.4, Spatial Evaluation of Pesticide Concentration, second paragraph:** Please consider adding text to the last sentence clarifying why "[t]he results suggest that an upgradient CERCLA-related release potentially resulting in the transport of contaminants to the lagoon via the eastern ephemeral stream is unlikely" (i.e., because if there was an upgradient CERCLA-related pesticide release, expected concentrations of pesticides at samples from stations SD09, SD10, and SD11 would be higher).

   Navy Response:

   The last sentence of the referenced paragraph has been revised as follows: "The non-detect (DDD and DDT) and low detect (DDE) results for the eastern half of the lagoon suggest that an upgradient CERCLA-related release potentially resulting in the transport of contaminants to the lagoon via the eastern ephemeral stream is unlikely because if there was an upgradient CERCLA-related pesticide release, expected concentrations of pesticides at samples from stations SD09, SD10, and SD11 would be higher."

4. **Page 2-10, Section 2.5:** Please consider adding text indicating that the concentrations of pesticides were attributed to use as intended (i.e., application for pest control), since the discussions in prior sections all present data to support this assumption.

   Navy Response:

   The following sentence has been added after the first sentence of Section 2.5: "In addition, the concentrations and spatial distribution of pesticides support the assumption that the likely source of pesticides was normal pesticide application."

5. **Table 2-1:** Please consider adding the sediment equilibrium partitioning values (lowest value if used sample-specific total organic carbon) to this table. Although the text states that all detected sediment concentrations are less than their respective equilibrium partitioning values, it would be helpful to show that comparison within this table (rather than attempt to find this comparison within the ecological risk assessment that is provided as an attachment). In addition, please consider including the columns for RSLs and ESVs on all pages of the table for clarity.

   Navy Response:

   Table 2-1 is associated with Step 5 of the Decision Analysis (Section 2.4) where data are compared to the most conservative screening values. Equilibrium partitioning (EqP) values are considered less conservative and are applied in the ecological risk assessment only after the conservative screening step (Step 2) is completed. Therefore, the less conservative EqP values are not included in the Decision Analysis table.

   Table 2-1 has been reformatted to show RSL and ESV columns on each page.

Final Responses to USFWS Comments of the

Draft No Action Decision Document for Laguna La Chiva

Atlantic Fleet Weapons Training Area—Vieques
Former Naval Ammunition Support Detachment
Vieques, Puerto Rico

1. Page 2-4. Section2.3.3. Future Land Use and Potential Receptors. While crabbing is mentioned, the paragraph that described future land use does not discuss land crabbing as a potential use. Currently land crabbing is occurring in the area and the Vieques NWR has allowed crabbing in the area through the Special Use Permit process. This should be considered in the document's analysis.

   Navy Response:

   Please recall that the receptors evaluated in the HHRA were concurred upon by all agencies, as documented in Worksheet #10 ("Conceptual Site Model") of the Final Sampling and Analysis Plan (CH2MHILL 2013). In addition, as indicated in Section 2.2.2 and Figure 2-1 of the No Action Decision Document, NOAA collected land crab tissue samples from Vieques Island, including around Laguna La Chiva, in 2005. The Public Health Consultation (PHC) prepared by the Agency for Toxic Substances and Disease Registry (ATSDR), in part using the NOAA data, stated that the level of pesticides found in the land crab samples were much lower than levels reported to cause harmful health effects (ATSDR, 2006).

2. Page 2-7. Human Health Risk Assessment. We suggest that "Residents" be removed from the receptor group of the conceptual site model as it is not anticipated that there will be people "residing" in the area. We question why "DDE was identified as a COPC in surface soil for the direct contact exposure pathway" for Recreational Users/Trespassers/Site Visitors but not for Maintenance Workers/Industrial Workers/Construction Workers. This second group, which would include FWS personnel, would spend the most amount of time in the site over the long term. In addition, the Fish Consumers/Blue Crab Consumers receptor does not include consumers of land crabs, which are likely to be consumed to a greater extent than blue crabs.

   Navy Response:

   As indicated in Table 1 ("Selection of Exposure Pathways") of the HHRA, the site will not be developed for residential use, but the residential scenario is included to evaluate unrestricted land use. As noted in the response to PREQB Comment 2, the following text has been added after the fourth sentence of the first paragraph of Section 2.3.3 and at the end of the first paragraph under the "Human Health Risk Assessment" in Step 6 of Section 2.4:

   > "Although the site will not be developed for residential use, a residential scenario was included in the HHRA to evaluate the unrestricted land use scenario."

   DDE was identified as a COPC in surface soil for Recreational Users/Trespassers/Site Visitors but not for Maintenance Workers/Industrial Workers/Construction Workers due to the difference in screening levels used for these receptor groups when identifying COPCs. Residential screening levels (which are more conservative than industrial screening levels) were used for Recreational Users/Trespassers/Site Visitors. With respect to land crab consumption, please see the response to USFWS Comment #1.