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September 22, 2011

U.S. Environmental Protection Agency - Region II
290 Broadway – 22nd Floor
New York, New York 10007-1866

Attn: Mr. Adolph Everett, P.E.
Chief, RCRA Programs Branch

Re: Contract N62470-10-D-3000
IQC for A/E Services for Multi-Media
Environmental Compliance Engineering Support
Delivery Order (DO) JM01
U.S. Naval Activity Puerto Rico (NAPR)
EPA I.D. No. PR2170027203
Revised Final Phase I RCRA Facility Investigation Report for SWMU 75

Dear Mr. Everett:

Michael Baker Jr., Inc. (Baker), on behalf of the Navy, is pleased to provide you with one hard copy and one electronic copy provided on CD of the replacement pages for the Final Phase I RCRA Facility Investigation Report for SWMU 75. These replacement pages make up the Revised Final Phase I RCRA Facility Investigation Report for SWMU 75. Directions for inserting these pages into the Final Report are provided for your use.

This report is being submitted in accordance with EPA comments dated May 20, 2011 in which EPA accepted the Navy's Response to Comment and the Final Phase I RFI Report. Responses to PREQB comments were also accepted, with the exception of the following four comments (page-specific comments 7c, 8b, 11 and Appendix B, comment 1). A "Working Draft" of the Navy's responses to the four PREQB comments was submitted to EPA and PREQB on August 26, 2011. PREQB provided additional discussion on one comment (Appendix B, comment 1) in an email from Gloria Toro Agrait dated September 8, 2011. The Navy's responses to these additional four comments are included for your review. Additional distribution has been made as indicated below.

If you have questions regarding this submittal, please contact Mr. Mark Davidson at (843) 743-2124.

Sincerely,

MICHAEL BAKER JR.. INC.

Mark E. Kimes, P.E.
Activity Coordinator

MEK/vk
Attachments

cc: Ms. Debra Evans-Ripley, BRAC PMO SE (letter only)
Mr. David Criswell, BRAC PMO SE (letter only)
Mr. Mark E. Davidson, BRAC PMO SE (1 hard copy and 1 CD)
Mr. Pedro Ruiz, NAPR (1 CD)
Mr. Tim Gordon, US EPA Region II (1 hard copy and 1 CD)
Mr. Carl Soderberg, US EPA Caribbean Office (1 hard copy and 1 CD)
Ms. Gloria Toro, PREQB (1 hard copy and 1 CD)
Ms. Bonnie Capito, NAVFAC Atlantic – Code EV42 (1 hard copy for Administrative Record)
Ms. Wilmarie Rivera, PREQB (1 CD)
Mr. Felix Lopez, US F&WS (1CD)
Ms. Brenda Smith, TechLaw, Inc. (1 CD)

NAVY RESPONSES TO EPA COMMENTS DATED DECEMBER 8, 2010
ON THE
DRAFT PHASE I RCRA FACILITY INVESTIGATION REPORT
SWMU 75 – BUILDING 803
DATED AUGUST 26, 2010

Following are the Navy's responses to outstanding comments on the Draft Phase I RCRA Facility Investigation Report for SWMU 75 (August 26, 2010). The original EPA comments on the Draft Report are dated December 8, 2010. The Navy responded to the original EPA comments and issued a Final Phase I RCRA Facility Investigation Report for SWMU 75 on March 1, 2011. In a letter to the Navy dated May 20, 2011, EPA accepted the Navy's Response to Comment and the Final Phase I RFI Report; responses to PREQB comments were also accepted, with the exception of the following four comments (page-specific comments 7c, 8b, 11 and Appendix B, comment 1), as discussed below. A "Working Draft" of the Navy's responses to the four PREQB comments was submitted to EPA and PREQB on August 26, 2011. PREQB provided additional discussion on one comment (Appendix B, comment 1) in an email from Gloria Toro Agrait dated September 8, 2011, also as discussed below. Note that the original comment number is retained to provide ready reference to the original December 8, 2010 comment letter. Agency comments are provided in italics and the Navy Response is provided in plain text.

II. PAGE-SPECIFIC COMMENTS

*7c. **PREQB Comment 7c, Page 6-4, Section 6.2:** Considering that semi-volatile organic compounds (SVOCs) are chemicals of potential concern for SWMU 75, please identify the basis for the final sentence in paragraph 2 which indicates that it has been interpreted that the SVOC and inorganic exceedances in the surface soils are attributed to SWMU 75 releases. Is there data that can be cited from other studies that indicate what constituents can be attributed to the fill that is present in this area?*

Navy Response to PREQB Comment 7c: The final sentence in paragraph 2 states that the SVOC and inorganic exceedances in the surface soils are NOT attributed to SWMU 75 releases. These constituents are not indicative of materials suspected to have been used during operation of the pump house. This justification has been added as the last sentence of Section 6.2.

***PREQB Evaluation of Navy Response to PREQB Comment 7c:** Please provide data to support the statement that SVOCs and inorganics are not attributable to SWMU 75 and that "these constituents are not indicative of materials suspected to have been used during operation of the pump house." LLPAHs and inorganics are the focus of the Full RFI investigation and diesel and waste oil releases were observed in the pumphouse. Therefore, SVOCs and inorganics may be attributed to site releases.*

Navy Response to PREQB Comment 7c: The subject paragraph in Section 6.2 has been revised as follows.

> "Although a few additional SVOCs and metals exceeded one or more of the regulatory screening criteria, the reported SVOC concentrations did not exceed the Regional Industrial SLs, and the reported metal concentrations were generally below the Base background screening values. Some of these SVOCs and metals may be a result of anthropogenic influences due to the industrial nature of the area and presence of ubiquitous fill material, and not a result of a direct release from the SWMU. These anthropogenic relationships should be furthered explored during the Full RFI Investigation."

In addition, Section 7.1 has been revised to recommend further exploration of the anthropogenic influences in the vicinity of SWMU 75.

8b. ***PREQB Comment 8b, Page 6-5, Section 6.3, last paragraph:*** *As commented on previously, please clarify the basis for the last sentence of this paragraph, which states "…It is interpreted that these SVOC exceedances of established screening criteria are not attributed to SWMU 75 releases." It appears that SVOC exceedances are being attributed to fill material. If so, please discuss the lines of evidence to support this assumption.*

Navy Response to PREQB Comment 8b: See Navy Response to PREQB Page-Specific Comment 7c.

PREQB Evaluation of Response: *Please see PREQB's evaluation of response to Page-Specific Comment 7c.*

Navy Response to PREQB Comment 8b: The subject paragraph in Section 6.3 has been revised as follows. In addition, Section 7.1 has been revised accordingly.

> "Some of these SVOCs and metals may be a result of anthropogenic influences due to the industrial nature of the area and presence of ubiquitous fill material, and not a result of a direct release from the SWMU. These anthropogenic relationships should be furthered explored during the Full RFI Investigation."

11. ***PREQB Comment 11, Figure 2-3:*** *Please clarify whether SWMU 75 only includes Building 803 and associated trench system or also includes Buildings 978, 976 and 896. This figure shows the boundary for SWMU 75 as including all of Building 978 and a portion of Buildings 976 and 896. If these buildings are included within the SWMU 75 boundary, please add text to the document clarifying whether investigations have been conducted or are planned for these buildings. If these building are not included as part of SWMU 75, please clarify why this figure and Figure 4-1 show that SWMU 75 includes these buildings.*

Navy Response to PREQB Comment 11: SWMU 75 includes only Building 803 and the concrete conduit. SWMU boundaries are generally arbitrary to include the area of focus and a buffer area. As described in the second paragraph of Section 2.2 Building 976 is an open-aired structure (canopy) that contains hose racks; Building 896 is an open-aired structure that covers SWMU 74 fuel pipelines and valves (Sections 4.1 and 4.3); and Building 978 is an electrical substation for Pier No. 3 (the berthing pier) located immediately adjacent to Building 803. Sections 4.3 and 5.1 have been revised to clarify the description of the electrical substation designated Building 978. Revisions to the figures are not required.

PREQB Evaluation of Response: *To ensure consistency between the text and figures, please indicate on the figures those structures that are not considered part of SWMU 75 that are within the SWMU 75 boundary.*

Navy Response to PREQB Comment 11: Figures 2-3, 4-1, 6-1 through 6-4 and 7-1 have been revised to include the following note:

> Note: SWMU 75 includes only Building 803 and the underground concrete trench.
> SWMU 75 does not include Buildings 896, 976, or 978.

Appendix B, Chain of Custody Forms

1. *According to the chains-of-custody, soil samples for GRO analysis were collected in 4-oz. jars with no preservative. According to the analytical method (SW-846 5035/8015B) and Chapter 4 of SW-846, these samples should be collected in preservative similar to VOC soil samples since GRO is a volatile parameter. Without the preservation, sample results are not reliable and should not be used for decision-making purposes. Please explain why these samples were not preserved and revise all tables and validation reports to qualify these data as rejected due to the lack of preservation, as per EPA Region 2 VOC validation guidelines.*

Navy Response to PREQB Comment 1, Appendix B: CompuChem was the laboratory utilized for this project and they provided Michael Baker Corporation personnel 2oz and 4 oz jars for collection of samples for GRO determination. The sampling containers were provided so that CompuChem could employ SW 846 Method 5035, Section 6.2.3. CompuChem made the decision to provide the jars for collection because the Project Action Limits were expressed as 250mg/Kg. Since 200mg/Kg is considered "High Concentration" CompuChem intended to use method 5035 for collection and analysis of samples, however the lab determined that the volatile compound concentrations in these samples were not high concentration, therefore they decided to prepare and analyze the samples using low concentration techniques.

All samples were continually maintained at 4ºC ±2ºC, without opening or transferring any sample until the actual time of analysis, in order to prevent/minimize volatile loss in the laboratory during sample storage prior to analysis. The sample collection jars have a Teflon seal in the cap for the prevention of loss of volatile compounds. CompuChem used SW 846 Method 5030B, Section 6.2.1 to prepare the sample for analysis. The samples were analyzed immediately following the preparation. CompuChem interprets the method to allow preparation options for the analysis of volatile compounds (GRO). CompuChem determined that since SW 846 Method 5035, Section 6.2.3 was used for sampling, they could choose to use SW 846 Method 5030 for sample preparation, if, in their judgement, the samples did not contain high concentrations of volatile compounds. CompuChem's determination to use method 5030 is based on the interest to provide useable data at lower concentrations. Application of the criteria for 5030B, as stated in section 6.2 indicates that samples have a 14 day holding time from sampling to analysis. All samples analyzed by CompuChem for this project met the 14 day holding time indicated in the method.

All of the GRO results for this site were reported as non-detect. As stated in the data validation report for CompuChem SDG 1003252 "Soil samples were collected in unpreserved 4-0z jars and analyzed on days 10 and 11; therefore results were qualified as estimated and considered biased low." Consequently, the sample collection and preservation for GRO is appropriate and acceptable according to the referenced method. Note however, that 60 ml vial with appropriate preservative will be used for future GRO analyses of soils if this laboratory is selected for future work.

PREQB Evaluation of Response: *It appears that the laboratory provided Michael Baker Corporation with the incorrect bottles/preservatives for the collection of soil samples for GRO analysis. Although Section 6.2.3 of SW-846 Method 5035 allows for collection of an unpreserved soil sample, this is not allowed by EPA Region 2 and is only ever allowed per the method when one knows that the concentrations will be significantly elevated. When the "high concentration" method is needed, the required collection procedure would be to collect an undisturbed sample and preserve this in methanol. Although all samples were maintained at 4ºC ±2ºC without opening or transferring any sample until the actual time of analysis, samples were significantly compromised and the potential for volatilization was significant based on the collection procedure and the lack of field preservation. Note that:*

- *Volatilization will occur due to the collection of a "disturbed" sample versus the 5035 requirement for a collection of an undisturbed sample.*
- *When the laboratory opened the container to prepare the sample for analysis as well as during the laboratory subsampling procedure, this further compromised the sample. Current procedures do not even allow the container to be opened after collection. Please note that the low-level method utilizes a hermetically-sealed sample vial, the seal of which is never broken from the time of sampling to the time of analysis. Since the sample is never exposed to the atmosphere after sampling, the losses of VOCs during sample transport, handling, and analysis are minimized.*
- *Volatilization of the sample can also occur from exposure of the solid surface near the time of collection.*
- *Volatilization can occur from failed seals on the Teflon-lined caps of the bottles or VOA vials.*
- *Since samples were not chemically preserved upon collection, biodegradation during storage is possible.*

The above issues, combined with the fact that there were 10-11 days between collection and analysis, further supports the need to reject all nondetect GRO data collected for this investigation. These issues render the GRO data unusable for project objectives. Please revise the results accordingly and discuss the effects on the achievement of the project objectives.

Navy Response to PREQB Comment 1, Appendix B: GRO analysis in soil samples is typically conducted using Method 8015B/C. This analysis is based on summing the chromatographable constituents that elute between certain retention time markers. However, the analysis does not provide any information on the specific constituents of the GRO. Gasoline consists of a mixture of aliphatic and aromatic compounds including straight chain, branched, and cyclic alkanes. The typical contaminants of concern in gasoline are benzene, toluene, ethylbenzene, and xylenes (BTEX) as well as naphthalene and methyl tertiary butyl ether. All of these compounds are target analytes for analysis conducted using Method 8260B. Other components of gasoline can also be assessed as Tentatively Identified Compounds (TICs) in the analysis. All extraneous peaks in a GC/MS analyses can be library searched, and depending on the purity of the match fit, the unknown peak can be identified. Aside from producing the library search information, a total alkanes amount can also be assessed.

Since all of the soil samples in question were also analyzed for Appendix IX VOCs, CompuChem was requested to re-evaluate the GC/MS (8260B) analytical data and produce TIC information on those samples that had been analyzed for GRO using Method 8015B/C. The results of the re-evaluation were as follows:

- There were no BTEX compounds detected above the Reporting Limit (RL) of 5 µg/kg in any of the samples. The Maximum Permissible Level (MPL) for GRO in soil is 250 mg/kg.

- A GRO standard at 0.5 mg/kg was analyzed using the GC/MS. The Reconstructed Ion Chromatogram (RIC) from the GRO standard was then compared to the RIC for the samples. None of the samples displayed the same matrix as the GRO standard.

- TIC searches were conducted for all samples to determine if a mixture of aliphatic and aromatic compounds including straight chain, branched, and cyclic alkanes were present. None of the samples contained enough TICs to confirm GRO, let alone GRO constituents approaching anywhere near a total of 250 mg/kg.

Based on the results of this re-evaluation, the soil samples for GRO analysis were not compromised due to the collection procedure and lack of field preservation. The data are considered usable, as qualified by

the validator, for its intended purpose. However, as previously indicated, vials with the appropriate preservative will be used for future GRO analysis of soils. No changes to the text are warranted.

PREQB Evaluation of Response (provided via email from Gloria Toro Agrait on September 8, 2011): *Please include the evaluation discussed in the above response in the text of the report for clarity and transparency.*

Navy Response to PREQB Comment 1, Appendix B: The referenced text has been included in Section 6.4.2 Validation Summary of the Revised Final Phase I RFI Report for SWMU 75.

REVISED FINAL PHASE I RCRA FACILITY INVESTIGATION REPORT SWMU 75 – BUILDING 803

For NAVAL ACTIVITY PUERTO RICO
EPA I.D. No. PR2170027203
CEIBA, PUERTO RICO

Prepared for:

Department of the Navy
NAVFAC SOUTHEAST
North Charleston, South Carolina

Prepared by:

Michael Baker Jr., Inc.
Moon Township, PA

Contract No. N62470-10-D-3000
DO JM01

September 22, 2011

IQC for A/E Services for Multi-Media Environmental Compliance Engineering Support

REVISED FINAL

PHASE I RCRA FACILITY INVESTIGATION REPORT
SWMU 75 – BUILDING 803

NAVAL ACTIVITY PUERTO RICO
EPA I.D. NO. PR2170027203
CEIBA, PUERTO RICO

SEPTEMBER 22, 2011

Prepared for:

DEPARTMENT OF THE NAVY
NAVFAC SOUTHEAST
North Charleston, SC

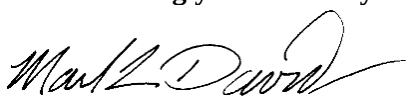
Under:

Contract No. N62470-10-D-3000
DELIVERY ORDER JM01

Prepared by:

MICHAEL BAKER JR., INC.
Moon Township, Pennsylvania

I certify under penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that this document and its attachments were prepared either by me personally or under my direction or supervision in a manner designed to ensure that qualified and knowledgeable personnel properly gather and present the information contained therein. I further certify, based on my personal knowledge or on my inquiry of those individuals immediately responsible for obtaining the information, that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowingly and willfully submitting a materially false statement.

Signature: 

Name: **Mark E. Davidson**

Title: **BRAC Env. Coordinator**

Date: **September 22, 2011**

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APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

AFWTF	Atlantic Fleet Weapons Training Facility
Baker	Michael Baker Jr., Inc.
bgs	below ground surface
BRAC	Base Realignment and Closure
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CADD	Computer Aided Design and Drafting
CCME	Canadian Council of Ministers of the Environment
CERCLA	Comprehensive Environmental Recovery, Compensation, and Liabilities Act
CERFA	Community Environmental Response Facilitation Act
CMS	Corrective Measures Study
CRQL	Contract Required Quantitation Limit
CSF	Cancer Slope Factors
DI	Deionized Water
DPT	Direct Push Technology
DRO	Diesel Range Organics
ECP	Environmental Condition of Property
ECO-SSL	Ecological Soil Screening Level
F	Fahrenheit
GIS	Geographic Information System
GPS	Global Positioning System
GRO	Gasoline Range Organics
HQ	Hazard Quotient
IAS	Initial Assessment Study
IDW	Investigation-Derived Waste
ILCR	Incremental Lifetime Cancer Risk
IUR	Inhalation Unit Risk
LANTDIV	Naval Facilities Engineering Command, Atlantic Division
LLPAH	Low-Level Polynuclear Aromatic Hydrocarbon
MC	Macro-Core®
MCL	Maximum Containment Level
MGD	Million Gallons per Day
MHSPE	Ministry of Housing, Spatial Planning and Environment
$\mu g/ft^2$	Micrograms per Square Foot
$mg/100cm^2$	Milligrams per 100 Centimeters Squared
MS/MSD	Matrix Spike/Matrix Spike Duplicate

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

NAPR	Naval Activity Puerto Rico
NAVFAC	Naval Facilities Engineering Command
NEESA	Naval Energy and Environmental Support Activity
NSRR	Naval Station Roosevelt Roads
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated biphenyls
PID	Photoionization Detector
PMO	Program Management Office
PSI	Physical Site Inspection
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RfC	Reference Concentration
RfD	Reference Dose
RFI	RCRA Facility Investigation
RTK	Real-Time Kinematic
SDG	Sample Delivery Group
SE	Southeast
SL	Screening Level
SOP	Standard Operating Procedure
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
TPH	Total Petroleum Hydrocarbons
TSCA	Toxic Substance Control Act
ULM	Upper limit of the means
UST	Underground Storage Tank
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This document presents the results of the Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 75 (Building 803) at Naval Activity Puerto Rico, Ceiba, Puerto Rico. This report has been prepared by Michael Baker Jr., Inc. (Baker), for the Navy Base Realignment and Closure (BRAC) Program Management Office (PMO) Southeast (SE) office under contract with the Naval Facilities Engineering Command (NAVFAC), SE (Contract Number N62470-10-D-3000, Delivery Order [JM01].

In anticipation of operational closure of Naval Station Roosevelt Roads (NSRR), currently designated as Naval Activity Puerto Rico (NAPR), the Naval Facilities Engineering Command, Atlantic Division (LANTDIV) prepared Phase I/Phase II Environmental Condition of Property (ECP) Reports to document the environmental condition of NSRR (LANTDIV, 2004). Section 8132 of the Fiscal Year 2004 Defense Appropriations Act, signed into law on September 30, 2003, directed that NSRR be disestablished within 6 months, and that the real estate disposal/transfer be carried out in accordance with procedures contained in the BRAC Act of 1990. This legislation requires that base closure be conducted in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), as amended by the Community Environmental Response Facilitation Act (CERFA).

Based on the analytical results of the Phase I/II ECP investigation, it was determined that additional analysis of the environment at SWMU 75 was necessary. The Final Phase I RFI Work Plan (Baker, 2007) was approved by the United States Environmental Protection Agency (USEPA) on December 20, 2007. This Phase I RFI Report presents the results of the Phase I RFI field investigation conducted on March 29, 2010.

1.1 Purpose of Report

A Phase I RFI is required as outlined in the NAPR RCRA § 7003 Administrative Order on Consent (USEPA, 2007). The RCRA Order provides for the development of a work plan, field investigation, and reporting on the findings of the investigation with recommendations of follow-up actions necessary to ensure protection of human health and the environment. This report has been prepared to document the findings of the March 29, 2010 Phase I RFI field investigation for SWMU 75 and serves as the basis for determining the nature of impacts from the potential release of hazardous constituents at the site.

1.2 Objectives

Based on results of the Phase I/II ECP, the objective of the Phase I RFI at SWMU 75 was to perform a surface and subsurface soil sampling program to determine whether operations from inside Building 803 has caused a release outside of the building and/or has impacted soil outside of the Building.

The soil sampling program included the installation of five soil borings. Five surface soil and nine subsurface soil samples were collected from the five borings and analyzed for Volatile Organic Compounds (VOCs), Semivolatile Organic Compounds (SVOCs) with low-level Polynuclear Aromatic Hydrocarbons (LLPAHs), Total Petroleum Hydrocarbons (TPH) Diesel Range Organics (DRO), Gasoline Range Organics (GRO) and Appendix IX Metals as described in the approved 2007 RFI Work Plan (Baker, 2007).

1.3 Organization of the Phase I RFI Report

This report is organized into eight sections. Section 1.0 of this document discusses the purpose and objectives of this RFI. Section 2.0 presents a brief summary of the background of NAPR and the history and previous investigations at SWMU 75. Section 3.0 discusses the climatology, topography and regional geology, hydrology and hydrogeology for NAPR. The scope of the field investigation is provided in Section 4.0. Section 5.0 presents and discusses the physical characteristics of the study area observed during this Phase I RFI investigation including the site geology and hydrogeology. Section 6.0 presents the laboratory analytical results performed on the environmental samples and quality assurance/quality control (QA/QC) samples collected during the Phase I RFI. Section 7.0 presents the conclusions and recommendations from the RFI, while Section 8.0 lists report references.

2.0 SITE BACKGROUND

This section provides the history and description of current conditions at NAPR and SWMU 75. This section also includes a summary of the results of previous investigations conducted at SWMU 75.

2.1 NAPR Description and History

NAPR occupies over 8,800 acres on the northern side of the east coast of Puerto Rico; along Vieques Passage with Vieques Island lying to the east about 10 miles off the harbor entrance (see Figure 2-1). NAPR also occupies the immediately adjacent islands of Piñeros and Cabeza de Perro, as presented on Figure 2-2. The northern entrance to NAPR is about 35 miles east along the coast road (Route 3) from San Juan. The property consists of 3,938 acres of upland (developable) property and 4,955 acres of environmentally sensitive areas including wetlands, mangrove, and wildlife habitat. The closest large town is Fajardo (population approximately 37,000), which is about 5 miles north of NAPR off Route 3. Ceiba (population approximately 17,000) adjoins the west boundary of NAPR (see Figure 2-1).

The facility was commissioned in 1943 as a Naval Operations Base, and re-designated as a Naval Station in 1957. NSRR operated as a Naval Station from 1957 until March 31, 2004. NSRR was one of the largest naval facilities in the world with more than 100 miles of paved roads, approximately 1,300 buildings, a large scale airfield (Ofstie Field), a deep water port and over 30 tenant commands. NSRR played a major role in providing communication support to the Atlantic and Caribbean areas and also served as a major training site for fleet exercises.

Section 8132 of Fiscal Year 2004 Defense Appropriations Act, signed into law on September 30, 2003, directed that NSRR be disestablished within 6 months, and that the real estate disposal/transfer be carried out in accordance with procedures contained in the BRAC Act of 1990. This legislation required that the base closure be conducted in accordance with the CERCLA, as amended by the CERFA. NSRR has undergone operational closure as of March 31, 2004 and has been designated as NAPR. The mission of NAPR is to protect the physical assets remaining, comply with environmental regulations, and sustain the value of the property until final disposal of the property. NAPR will continue until the real estate disposal/transfer is completed.

In anticipation of operational closure of NSRR, the LANTDIV prepared Phase I/Phase II ECP Reports to document the environmental condition of NSRR. The Draft Phase I Environmental Condition of Property Report dated March 31, 2004 (LANTDIV, 2004) identified new sites at NAPR based on the results of a review of records, an analysis of historic aerial photographs, physical site inspections, and interviews with persons familiar with past and current operations and activities. The new ECP sites had not been previously identified or investigated under existing environmental program areas. A Phase II ECP field investigation was performed in 2004 to conduct environmental sampling to determine if a release/disposal actually occurred at any of the Phase I ECP sites recommended for further evaluation in the Phase I ECP and, if so, whether any potential risk to human health was present. The Final Phase II Environmental Condition of Property Report recommended additional sampling (to be undertaken as part of the RCRA Program) at several sites to permit a more detailed assessment (NAVFAC Atlantic, 2005).

The final ECP report recommended completion of a RCRA facility investigation at SWMU 75, which was the basis for the Phase I RFI.

2.2 SWMU 75 Description and History

SWMU 75 includes the pump house for the emergency fire deluge system and is located in the waterfront area next to Pier No. 3, as shown on Figure 2-3. The ECP Phase I physical site inspection (PSI) identified releases of suspected waste oil and diesel fuel throughout the floor of the building, as well as numerous discarded oil filters. The floor of the building is constructed with an access area/manway that leads directly into Ensenada Honda via a subsurface concrete trench, as shown on Figure 2-3.

The Phase I ECP investigation confirmed that SWMU 75 was in fact, Building 803, not Building 976, an open-aired structure that consists of hose racks located just east of Building 803, as previously thought. During the PSI, numerous stains, oil filters and three batteries were also observed on the floor within Building 803. In addition, there are three access doors on the roof of Building 803 for removal and installation of the pumps inside the building. The doors to Building 803 and the roof access doors were all observed to be open to the outside elements.

The Final Phase I/II Environmental Condition of Property Report concluded that SWMU 75 has been impacted by past and present operations at NAPR. The results of the ECP Phase II Investigation indicated that the SWMU was characterized as presenting a low potential risk to human health. Even though lead concentrations exceeded the Toxic Substance Control Act (TSCA) standard for residential lead-based paint dust, the risk to human health is low due to the highly unlikely scenario that this building would be used for residential purposes. The potential ecological risk was undetermined.

A detailed description of the current site conditions is given in Section 5.1.

2.3 Previous Investigations

There have been two reports at SWMU 75, the 1994 Site Characterization Report and the Phase I/II ECP, as discussed in the following sections.

2.3.1 Site Characterization Report

In 1994 a Site Characterization (Blasland, Bouck, and Lee, 1994) was conducted at Building 803 to investigate an underground storage tank (UST), removed the prior year. Soil boring installation, monitoring well construction, slug tests, and groundwater sampling activities were included as part of the site characterization.

Five soil borings were advanced (803-SB1 through 803-SB5). One soil sample (from four to six feet) was collected from each boring for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX) and for Total Petroleum Hydrocarbons. Monitoring wells were installed and groundwater samples were collected at all five soil borings. The groundwater samples were analyzed for BTEX, TPH, and certain wells for total lead and/or polynuclear aromatic hydrocarbons (PAHs). Neither the soil samples nor the groundwater samples resulted in detections that were above applicable screening levels (SL) at that time. Based on the information contained in the report, no further actions or assessments were recommended for the site (Blasland, Bouck, and Lee, 1994).

2.3.2 Phase I/II ECP Report

During the Phase I/II ECP investigation performed in 2004, investigators noted numerous discarded oil filters, stains on the floor, three discarded batteries just inside the door to the facility, and evidence of previous releases of suspected waste oil and diesel fuel. As a result of the physical site inspection, investigators collected four wipe samples from the floor and walls of the interior of the building (NAVFAC Atlantic, 2005). It should be noted that the number and locations of wipe samples were determined in the field based on visual observations of site conditions (e.g., chemical staining), as proposed in the decision tree for this site found within the Final Phase I/II ECP Work Plan (LANTDIV, 2004).

Three wipe samples on the floor (21E-WS01 through 21E-WS03) and one wipe sample on a wall inside the building (21E-WS04, see Appendix A photographs for sample locations) were collected utilizing laboratory-supplied containers with gauze pads soaked in the appropriate solution based on the analysis requested. The samples were submitted to a fixed-based laboratory for analysis of Appendix IX SVOCs, Polychlorinated biphenyls (PCBs), and metals. Results of these analyses are presented in Appendix A.

Organic detections consisted of two SVOCs, bis(2-ehtylhexyl)phthalate and di-n-butylphthalate. The Phase I/II ECP report noted that bis(2-ehtylhexyl)phthalate was used as an organic pump fluid and di-n-butylphthalate as a manometer fluid. Both these uses are consistent with an emergency fire pump house.

Inorganic detections varied by at least five orders of magnitude, but all inorganic analytes were detected. As a point of reference for evaluating the magnitude of lead concentrations in the wipe samples, the data may be compared to Section 403 of TSCA, which specifies a limit of lead on the floor of a residence to be less than 40 micrograms per square foot ($\mu g/ft^2$). This concentration converts to 0.0043 milligrams per 100 centimeters squared ($mg/100cm^2$). All concentrations of lead on surfaces in Building 803 exceeded the TSCA standard for residential lead-based paint dust.

Based on the analytical results of the Phase I/II ECP investigation, it was determined that additional analysis at SWMU 75 was recommended to determine whether contamination from Building 803 has been released to the outside environment.

3.0 PHYSICAL CHARACTERISTICS OF STUDY AREA

The physical setting of NAPR was documented in the 1984 Initial Assessment Study (IAS) (Naval Energy and Environmental Support Activity [NEESA], 1984). This information is summarized in the paragraphs that follow.

3.1 Climatology

The climate associated with NAPR is characterized as warm and humid, with frequent showers occurring throughout the year. A major factor affecting the weather is the pattern of trade winds associated with the Bermuda High, the center of which is in the vicinity of 30° North, 30° West. The prevailing wind direction reflects the easterly trade winds. The area receives a surface flow varying between the northeast to the southeast about 75 percent of the year, and as much as 95 percent of the time in July when the easterly winds are strongest. The differential heating of the land and sea during the day tends to give a more northerly component to the flow on the northern side of the island and a more southerly component on the southern side. During the night, a land breeze causes a prevailing southeasterly flow in the north and a prevailing northeasterly flow over the southern coast. The mean annual wind velocity is 5.5 knots, with a minimum in November and a maximum in August. Gales associated with westward moving disturbances in the trade winds or hurricanes passing either north or south of the area have the highest probability of occurrence from June through October.

Uniform temperatures prevail, with small diurnal ranges as a result of insular exposure and the relatively small land areas. The warmest months are August and September, while the coolest are January and February. Mean annual maximum temperatures range from 82.0° Fahrenheit (F) in January to 88.2° F in August. The mean annual minimum temperatures vary from 64.0° F in January to 73.2° F in June. The highest maximum temperature recorded was 95.0° F, while the lowest minimum was 59.0° F. Rain usually occurs at least nine days in every month, with an average of 60 inches per year although a dry winter season occurs from December through April. About 22 thunderstorm-days occur per year, with maximum frequencies of 3 days per month from May through October.

In late summer, the mean sky cover begins a steady decrease from a monthly maximum average of 6.5-tenths coverage in September to a minimum monthly average of 4.4-tenths coverage in February. From March through August, the monthly average cloud cover increases steadily from 4.5- to 6.0 tenths coverage during the period. Over the open sea, a maximum of clouds (usually broken stratocumulus) occurs during early morning, with the skies clearing or becoming scattered with cumulus by afternoon. Completely clear or overcast skies are rare during daylight hours, while clear skies frequently occur at night.

The hurricane season is from mid-June through mid-September; maximum winds exceed 95 knots during severe hurricanes. An average of two tropical storms per year occurs in the study area, one of which usually reaches hurricane intensity.

3.2 Topography

The regional area of NAPR consists of an interrupted, narrow coastal plain with small valleys extending from the Sierra de Luquillo range, which has been severely eroded by streams into valleys several hundreds of feet deep. Slopes of up to 60° are common.

In the immediate area of NAPR, elevations range from sea level to approximately 295 feet. Immediately to the north of the NAPR boundary, the hills rise abruptly to heights of 800 to 1,050

feet above sea level, with the tallest peak located within 2 kilometers of the NAPR boundary. There is a series of three hilly areas on NAPR, two of which separate the southern airfield area from the Port/Industrial, Housing, and Personnel Support areas. The third set of hills is in the Bundy area. These ridgelines not only separate sections of NAPR, but also dictate the degree of allowable development. The ridgeline south of the airfield provides an excellent barrier, which effectively decreases the aircraft-generated noise reaching the Unaccompanied Enlisted Personnel Housing areas to an acceptable level. Relief is low along the shoreline and lagoons and mangrove swamps are common.

3.3 Geology, Hydrology, and Hydrogeology

Subsections 3.3.1 through 3.3.4 present the description of the geologic, hydrologic, and hydrogeologic conditions across NAPR. These are generally applicable, but may or may not be specifically-applicable, to the SWMU 75 area. Site specific geologic, hydrologic, and hydrogeologic information can be found in sections 5.2.1 and 5.2.2.

3.3.1 Soils

The soil associations found at NAPR are predominantly of two types typical of humid areas, namely the Swamps-Marshes Association and the Mabi-Rio-Arriba-Cayagua Association, as well as the Descalabrado-Guayama Association, which is typical of dry areas. In addition, isolated areas of the Caguabo-Mucara-Naranjito Association, the Coloso-Toa-Bajura Association, and the Jacana Amelia-Fraternidad Association are found at NAPR.

The Swamps-Marshes and Mabi-Rio-Arriba-Cayagua associations cover over one half of NAPR's surface area and are equally distributed. Primarily the Descalabrado-Guayama and Caguabo-Mucara-Naranjito associations cover the remaining area.

The Swamps-Marshes Association consists of deep, very poorly drained soils. This association is found in level or nearly level areas that are slightly above sea level but are wet, and when the tide is high, are covered or affected by saltwater or brackish water. The soils are sandy or clayey, and contain organic materials from decaying mangrove trees. Coral, shells, and marl at varying depths underlie them. The high concentration of salt inhibits the growth of all vegetation except mangrove trees, and in small-scattered patches, other salt-tolerant plants.

The Mabi-Rio-Arriba-Cayagua Association consists generally of deep, somewhat poorly drained and moderately well drained, nearly level to moderately steep soils found on foot and side slopes, terraces, and alluvial fans. Soils of this association at NAPR are basically clayey.

The Descalabrado-Guayama Association generally consists of shallow, well drained, strongly sloping to very steep soils on volcanic uplands. Soils of this association are found primarily in the hilly areas located directly inland and adjacent to the soils of the Swamps-Marshes Association.

The Caguabo-Mucara-Naranjito Association consists generally of shallow and moderately deep, well drained, sloping to very steep soils on volcanic uplands. This association consists of soils that formed in residual material weathered from volcanic rocks. This association is represented at NAPR by soils of the Sabana series, which are found on the side slopes and the hilly terrain west of Langley Drive in the Bundy area. These soils are suited for pasture and woodland. Steep slopes, susceptibility to erosion, and depth to bedrock are the main limitations for farming and for recreation and urban areas.

The Coloso-Toa-Bajura Association consists of deep, moderately well drained to poorly drained, nearly level soils found on floodplains. This soil association extends along the western boundary of NAPR and around the airfield. The soils of this association formed in fine-textured and moderately fine-textured sediment of mixed origin on floodplains. The Coloso soils are deep and somewhat poorly drained; the Toa soils are deep and moderately well drained; and the Bajura soils and Maunabo soils are deep and poorly drained. The Reilly soils, also part of this association, are shallow sand and gravel and are excessively drained; they lie adjacent to streams. The minor soils are Talante, Vivi, Fortuna, Vega Alta, and Vega Baja. The Talante, Vivi, Fortuna, and Vega Baja soils are found on floodplains, while the Vega Alta soils occupy slightly higher positions on terraces.

The Jacana-Amelia-Fraternidad Association consists generally of moderately deep and deep, well drained and moderately well drained, nearly level to strongly sloping soils on terraces, alluvial fans, and foot slopes. This association is represented at NAPR by soils of the Jacana series, which consist of moderately deep, well-drained soils found on the foot slopes and low rolling hills along Langley Drive and just east of the airfield. These soils formed in fine-textured sediment and residuum derived from basic volcanic rocks.

3.3.2 Regional Geology

The underlying geology of the NAPR area is predominantly volcanic (composed of lava and tuff), as well as sedimentary (rocks derived from discontinuous beds of limestone). These rocks all range in age from early Cretaceous to middle Eocene. The volcanic rocks and interbedded limestone have been complexly faulted, folded, metamorphosed, and variously intruded by dioritic rocks. This complex geological structuring occurred sometime after the deposition of the limestone during the middle Tertiary, when Puerto Rico was separated from the other major Antillean Islands by block faulting, and was arched, uplifted, and tilted to the northeast. Culebra, Vieques, and the Virgin Islands are part of the Puerto Rican block; they are separated from the main island simply because of the drowning that resulted from the tilting.

In addition to the predominant volcanic and sedimentary rock, unconsolidated alluvial and older deposits from the Quaternary period underlie the northwestern and western sectors of the base.

The primary geologic formations on and near NAPR are various beach deposits, alluvium, quartz diorite and granodiorite, quartz keratophyre, the Daguao Formation, and the Figuera Lava. The Peña Pobre fault zone traverses NAPR.

3.3.3 Regional Hydrology

The surface waters that flow across the northeastern plain of Puerto Rico, where NAPR is located, originate on the eastern slopes of the Sierra De Luquillo Mountains. Surface runoff is channeled into various rivers and streams that eventually flow into the Caribbean Sea. The Daguao River and Quebrada Seca Stream (a tributary to Rio Daguao) collect surface waters from the hills immediately north of NAPR and, in periods of heavy rain, flooding on NAPR occurs. The Daguao-Quebrada Seca watershed comprises an area of approximately 7.6 square miles (4,900 acres), and the river falls some 700 feet from its source to sea level. Increased development in the town of Ceiba, especially in areas adjacent to NAPR's northern boundary, has significantly increased the surface runoff reaching NAPR, causing ponding and erosion in the Boxer Drive area. Boxer Drive, for a major portion of its length, is subject to surface water flooding, as are Hangar 200 and Hangar 379 and adjacent apron areas. This condition has been alleviated by the construction of a new highway (Route 3) immediately outside the fence and the realignment of Boxer Drive both with attendant storm water management features.

In the low-lying shore areas, seawater flooding results from storms, wind, and abnormally high tides. The tidal ranges in the NAPR area are rather small, with a maximum spring range of less than three feet. The tides are semidiurnal and have a usual range of about one-foot in the main harbor of NAPR.

Little information exists concerning the hydrogeology of NAPR. The only known potential sources of groundwater lie in lenticular beds of clay, sand and gravel, and rock fragments, which occur at a depth of less than 30 meters. No wells have been developed on site from these layers. Some wells had been developed upgradient of NAPR in Ceiba, some three kilometers from base headquarters, but were abandoned due to high levels of salinity.

The quality of surface waters is variable, reflecting the drainage area through which the water flows. Generally, surface waters have high turbidities and bio-organics (naturally occurring organics, such as decay products of vegetable and animal matter) due to the periodic heavy rains that can easily erode soils from steep slopes, exposed areas and disturbed streambeds. Water from alluvial aquifers along the coast of NAPR is of a calcium bicarbonate type, and has high concentrations of iron and manganese. The source of these minerals is unknown, but they may be derived from buried swamp or lagoon deposits.

A seawater-freshwater interface is present in the aquifers throughout the coastal areas of Puerto Rico, usually within a short distance inland of the coastline.

The NAPR potable water treatment plant receives raw water from the Rio Blanco through a 27-inch reinforced concrete pipe that replaced the old, open channel. The intake is located at the foot of the El Yunque rain forest. This buried raw water line traverses a distance of 14 miles from the intake to the NAPR boundary. A raw water reservoir is located at the water treatment plant and has a 45 million gallon capacity. Additionally, there are two fire protection storage reservoirs with a total capacity of 520,000 gallons.

NAPR has been served for over 30 years by the present water treatment facility. The plant (Building 88) has a capacity of 4.0 million gallons per day (MGD). Water flows by gravity into a 45 million-gallon raw water storage basin from which the plant draws its supply at a rate of 1.3 MGD on average. Treatment consists of pre-chlorination, coagulation sedimentation, filtration, and post-chlorination.

3.3.4 Regional Hydrogeology

In 2004, Baker conducted a Phase II ECP investigation involving 20 sites throughout NAPR (LANTDIV, 2004). Some consistent stratigraphic trends were observed during the ECP, which is discussed in this subsection. For the sake of simplicity, the NAPR regional geology can be divided into three regions:

- Upland areas
- Near-shore flat lands
- Inland flat lands

The upland areas of NAPR includes the hills encompassing the Tow Way Fuel Farm and hospital areas, and the hills encompassing the area behind the Exchange, the former Atlantic Fleet Weapons Training Facility (AFWTF) Command, and the Bundy area. These upland areas are underlain by bedrock (predominately Gabbro) and exhibit varying degrees of weathering.

Typically, the bedrock is overlain be a relatively thin residual soil (i.e., residuum). Residuum is unconsolidated soil, originating from weathered-in-place bedrock. This residuum generally consists of sand, silt, and clay.

The near-shore areas include the mangrove swamp areas as well as the shores of Ensenada Honda and Puerca Bay. The near-shore areas are typically underlain by marine sand layers (with coral and shell fragments), silt and clay layers, and occasional peat layers. In some near-shore areas, particularly by the harbor and Camp Moscrip in the southeastern portion of the base, fill material overlays the marine layers. The fill consists of rock fragments, debris (e.g., brick), sand, silt, and clay.

The inland flat land area generally encompasses the airfield and golf course areas. The inland flat land area is typically underlain by relatively thick residuum. The residuum generally consists predominately of clay. Fill material overlays the residuum in some areas, particularly the airfield, and generally consists of sand and gravel with lesser amounts of silt and clay.

4.0 PHASE I RCRA FACILITY INVESTIGATION ACTIVITIES

This section summarizes the Phase I RFI field work, analytical, and data validation activities that were associated with the March 29, 2010 field investigation. Field activities performed to support this RFI included:

- Five surface soil samples collected from five boring locations;
- Nine subsurface soil samples collected from the five boring locations;

The investigation was generally conducted in accordance with the Final Phase I RCRA RFI Work Plan for SWMU 75 (Baker, 2007). Any deviations to the work plan are discussed below. The sampling program proposed in the approved Work Plan was implemented in order to further characterize and delineate the site based on the results of the Phase I/II ECP investigations. Deviations from the Work Plan are described within the appropriate section(s) that follow. Refer to Figure 4-1 for the soil boring locations.

The environmental and QA/QC samples collected from the site were analyzed at a fixed-base laboratory (see Section 4.8) and the data was validated by an independent third party (see Section 4.9). A summary matrix showing the samples that were collected and the analyses requested on is shown in Table 4-1. Field duplicates and matrix spike/matrix spike duplicate samples and the analyses conducted on these samples are also shown in Table 4-1. Other QA/QC samples (trip blanks, field blanks, and equipment rinsates) collected and the analyses conducted on these samples are shown in Table 4-2. The analytical parameter lists and the contract required quantitation limits are shown in Table 4-3.

Other field activities were also conducted in support of the investigation of this site. These activities consisted of utility clearance, site clearing, surveying, and management of investigation derived wastes and are discussed in Sections 4.3 through 4.6.

Field notes containing descriptions of the site activities, site photographs, soil boring logs, field log notes, and chain-of-custody records are presented in Appendix B. Laboratory analytical results for surface and subsurface soil and QA/QC samples are presented in Appendix C. Data Validation report summaries are provided in Appendix D.

4.1 Surface and Subsurface Soil Sampling

Five surface and nine subsurface soil samples were collected from the soil boring locations shown on Figure 4-1. Two subsurface soils samples were collected at each soil boring except from soil boring 75SB05 where only one subsurface soil was collected due to refusal at 4 feet bgs. Table 4-4 summarizes the soil boring specifications. The soil borings (75SB01 through 75SB05) were installed at the locations proposed in the work plan with the exception of 75BS03. Soil boring 75SB03 was moved from its proposed sidegradient location due to direct push technology (DPT) drill rig inaccessibility and overall safety; a narrow amount of space between Buildings 803 and 896, and the presence of electrical equipment used to service Building 896 (e.g., pipeline valves and lighting) precluded drilling from this area. Therefore, soil boring 75SB03 was moved to a location on the east side of Building 896 which covers SWMU 74 fuel pipelines and valves. Upon further review of the soil boring 75SB03 location, it is evident that this data station is not representative of SWMU 75 and potential releases from Building 803. Surface soil sample 75SB03-00 exceeded the Regional Residential Screening Level (SL) for several SVOCs and the selected ecological screening and Base background for lead (see Section 6.1 for details). Proposed Phase II Corrective Measures Study (CMS) activities at the Fueling Piers Area of SWMU 74 will include further characterization of surface soil (Baker, 2010). The Fueling Piers Area of SWMU 74 includes soil boring location 75SB03.

Soil borings were advanced using a track-mounted DPT rig (Geoprobe 6610 DT rig operated by GeoEnviroTech, Inc., of San Juan, Puerto Rico) and samples were collected using a 4-foot Geoprobe Macro-Core® (MC) Sampler and disposable, clear acetate liners. Soil boring logs are presented in Appendix B.

Soil samples were field-screened for non-specific, total VOCs using a photoionization detector (PID) equipped with an 11.7 eV probe and calibrated to isobutylene. The PID readings were recorded on the drilling logs for each boring (Appendix B). The field screening procedure for soils collected using the DPT MC Sampler involved making a longitudinal cut along the entire length of the MC liner, separating the two edges of the liner, and screening the entire length of the soil core with a PID at approximately 0.5 foot intervals. Measurable organic vapors above background levels were not observed in any of the five boreholes or during the general PID air monitoring.

Surface soil samples were collected from a depth of 0 to 1 foot below ground surface (bgs) from soil borings 75SB01 through 75SB05 and included one field duplicate from 75SB04. Five surface soil samples (as shown on Table 4-1) were analyzed for Appendix IX VOCs, SVOCs with LLPAHs, TPH DRO/GRO, and metals. The samples were transferred directly into pre-labeled sample jars and placed on ice. As per the approved Work Plan, surface soil samples were proposed using stainless steel spoons. However, it was determined in the field that collecting the surface soil samples with DPT was a more efficient and effective sampling approach.

Two subsurface soil samples were collected from each boring (except for 75SB05) for a total of nine environmental samples, as shown on Table 4-1. In addition, one field duplicate (75SB01-01D) and one matrix spike/matrix spike duplicate (MS/MSD) (75SB04-01MS/MSD) were collected. All subsurface samples collected were analyzed for VOCs, SVOCs with LLPAHs, TPH DRO/GRO, and metals. Since impacts to subsurface soil were not evident based on visual, olfactory, or photoionization detector (PID) screening, subsurface soil samples were collected from the 1 to 3 feet bgs interval (immediately below the surface soil interval) and the 7 to 9 feet bgs interval (just above the water table). Note that only one subsurface soil sample was collected at location 75SB05 due to refusal at 4 feet bgs. The subsurface soil samples were transferred directly into pre-labeled sample jars and placed on ice.

4.2 Groundwater Level Measurements

Although monitoring well installation and groundwater sampling programs were not proposed as part of the approved Work Plan, depth to groundwater measurements were collected from two existing monitoring wells found on site. The field team referenced the two wells as "MW-N" and "MW-S". However, based on the 1994 Site Characterization Report (Blasland, Bouck, & Lee, 1994), MW-N was later identified as "803-MW4", and MW-S as "803-MW5". Groundwater level measurements were collected from the two wells at the end of the SWMU 75 Phase I field investigation on March 31, 2010. All groundwater level measurements are provided in the field log books in Appendix B. The March 31, 2010 groundwater level measurements also are provided on Table 4-4. A potentiometric surface map was not developed as only two monitoring wells were identified. Note that a third existing well, designated 803-MW2, was identified during a January 2011 site visit. This well is located to the west of well 803-MW5.

Groundwater levels were measured from the top of polyvinyl chloride (PVC) riser and the groundwater elevations were calculated from the surveyed elevation of the top of riser. A discussion of the survey activities is provided in Section 4.6. A potentiometric surface/groundwater contour map was not developed as only two groundwater data stations were identified. The anticipated groundwater flow direction is westerly toward Ensenada Honda.

4.3 Utility Clearance

As per the approved Work Plan, all proposed boring locations were first checked for the presence of subsurface utilities. Although, base utility mapping did not indicate the presence of utilities within the SWMU 75 boundary; it was known that the SWMU 74 fuel pipelines were located along the access road to Building 896, Pier No. 3, and an electrical substation (designated Building 978), all located in the vicinity of SWMU 75. The sampling locations were field-located using a Global Positioning System (GPS), and the absence of subsurface utilities was field verified to the extent possible. Underground utilities were not encountered during drilling activities.

4.4 Site Clearing

Once utility clearance was achieved and the proposed samples were located using a GPS unit, minimal site clearing activities were performed on the northeast side of Building 803 to provide access routes for the drill rig to the proposed sample locations. The proposed sample locations were marked with pin flagging.

4.5 Decontamination and Investigation Derived Waste

There were no IDW samples collected as part of the SWMU 75 Phase I investigation. Disposable sampling tools were used for soil sampling in order to minimize the generation of liquid investigation-derived waste (IDW) from decontamination. Non-disposable sampling equipment (i.e., DPT drill rig and tools) were decontaminated according to Standard Operating Procedure (SOP) F502 Decontamination of Sampling and Monitoring Equipment. The small volume of decontamination liquid (approximately three gallons) was containerized with the SWMU 67 liquids as the two investigations were performed concurrently. The soil cuttings from the soil borings were placed back into the boring from which they came, as contamination was not observed. As much as possible, soils last out of the hole were returned first, thereby, approximating original stratigraphy.

4.6 Surveying

Prior to entering the field, an electronic "shape file" (which included each proposed soil boring location) was uploaded to a GPS data collector. Once in the field, the GPS unit was used to navigate to each sample location. Each sample location was flagged and identified using the numbering system as described in the soil sampling and analysis section of the work plan.

As a sub-consultant to Baker, the Transystem Corporation conducted a multi-site survey at NAPR on March 30, 31, and April 1, 2010 at SWMUs 57, 61, 67, and 75. At SWMU 75, after each soil boring was advanced, their coordinates were more accurately surveyed using a combination (where appropriate) of Real-Time Kinematic (RTK) GPS and conventional survey methods. RTK GPS surveying employs a GPS base station and a GPS rover that reads satellite carrier phase signals. Where areas of the site were open to satellites, the RTK survey method was utilized. In contrast, conventional survey methods were used where portions of the site were covered by a vegetative canopy and hindered satellite signal. RTK GPS and conventional surveying were selected specifically because of the accuracy of data they provide to produce groundwater contour mapping:

RTK GPS:
+/- 0.08 Vertical
+/- 0.05 Horizontal

Conventional:
+/- 0.01 Vertical
+/- 0.05 Horizontal

Also, existing monitoring wells ("MW-N" and "MW-S") identified at the SWMU were also surveyed. An elevation was obtained from the top of PVC riser for water level elevation calculations and a spot ground surface elevation was also obtained. All survey data was submitted to Baker for use in office application software such as Auto Computer Aided Design and Drafting (CADD). Coordinates were obtained and input into a CADD/Geographic Information System (GIS) to produce the maps used in this RFI report.

4.7 QA/QC Sampling

The following QA/QC samples were collected during the investigation of this site:

- Field Duplicates
- Trip Blanks
- Matrix Spike/Matrix Spike Duplicates (MS/MSDs)
- Field Blank
- Equipment Rinsate Blanks

Table 4-2 provides a summary of the QA/QC samples collected at SWMU 75.

4.7.1 Field Duplicates

Field duplicates were collected at a minimum rate of approximately 10 percent of primary environmental samples in accordance with the work plan. For soil boring samples, one field duplicate surface soil sample (75SB04-00D) was collected corresponding to five surface soil samples, and one subsurface soil duplicate sample (75SB01-01D) was collected corresponding to nine subsurface soil samples. Field duplicates were analyzed for the same parameters as the primary samples and the results were used to evaluate the field sampling methodology.

4.7.2 Trip Blanks

One trip blank sample was included in the cooler containing the samples from the site intended for VOC and/or GRO analysis to evaluate whether cross contamination occurred during shipping of samples. Given the volume of samples, only one shipment (March 30, 2010) was required for SWMU 75. One trip blank (75TB01) accompanied samples from this site and was analyzed for Appendix IX VOCs and TPH GRO.

4.7.3 Matrix Spike/Matrix Spike Duplicates

MS/MSD samples were collected at a minimum rate of approximately 20 percent of primary environmental samples from the soil boring samples. For soil boring samples, one set of MS/MSD (75SB04-01MS/MSD) was collected corresponding to 15 surface and subsurface soil samples. The MS/MSD samples were analyzed for the same parameters as the primary environmental samples and the results were used to evaluate the effect of each type of matrix on the analytical method.

4.7.4 Field Blanks

One field blank sample (75FB01) was collected from laboratory-grade deionized (DI) water used as the source water for the equipment rinsate sample. No store bought distilled water was used during this investigation for decontamination purposes, so an additional field blank was not collected. The field blank samples were analyzed for VOCs, SVOCs with LLPAHs, TPH GRO and DRO, and metals, to determine whether the water used for generating the equipment rinsate was free of chemicals at levels of concern for the site.

4.7.5 Equipment Rinsates

All sampling activities were conducted and completed on March 29, 2010. Therefore, only one equipment rinsate (75ER01) was collected. 75ER01 was collected from a disposable Macro Core Liner used on March 29, 2010. Equipment rinsate sample 75ER01 was analyzed for VOCs, SVOCs with LLPAHs, TPH GRO and DRO, and metals.

4.8 Laboratory Analysis

Fixed-base laboratory analysis was conducted by CompuChem Laboratories, Cary, North Carolina. The list of parameters under the analytical program and the Contract Required Quantitation Limits (CRQLs) are provided in Table 4-3. The laboratory analytical results are provided as Appendix D.

4.9 Data Validation

All fixed-base laboratory data was validated by Data Qual Environmental Services, LLC. of St. Louis Missouri, an independent third party. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures (SOP) for Validation of Organic Data Acquired Using SW-846 Methods, and professional judgment. Region II has not developed a validation checklist SOP for the methods used to assess the organic methods for hydrocarbons and inorganic methods (SW-846 Methods 8015 [DRO and GRO], 6010B, 6020B and 7471A). Therefore, alternative worksheets were provided, Region II flagging conventions were used. Data Validation Summaries for each Sample Delivery Group (SDG) and the Puerto Rican Chemist Certifications are provided as Appendix D.

5.0 PHYSICAL RESULTS

The following sections provide a brief discussion of the current site conditions at SWMU 75 at the time of the Phase I RFI field investigation, conducted on March 29, 2010. The site geology and hydrogeology, as ascertained from the soil boring program and other available information, is described herein.

5.1 Current Conditions

SWMU 75 - Building 803 is less than 0.25 acre in size and is located next to Pier No. 3 in the waterfront area of the base. Building 803 is currently not utilized or in operation. As shown on Figures 2-3 and 4-1, SWMU 75 is bound by Building 978 (which is an electrical substation) to the northwest; and open Building 896 (which covers SWMU 74 fuel pipelines and valves) to the southeast. The southwestern side of SWMU 75 faces Pier No. 3 and the Ensenada Honda. A small vegetated area separates the northeastern side of SWMU 75 from an open storage area (Building 976) to the northeast.

The site is currently situated in an industrial area with a total of approximately 360 square feet of vegetated ground on the northeast and southwest side of Building 803. The majority of vegetation is commonly associated with previously disturbed (or developed) environs. For SWMU 75, dominant vegetation included guinea grass (*Urochloa maxima*), fringed windmill grass (*chloris ciliata*), ocean blue morning glory (*Ipomea indica*), white lead tree (*Leucaena leucocephala*), and monkey pod (*Pithecellobium dulce*). Given its small size, location on base, and lack of herbaceous diversity; little to no terrestrial habitat is available at this SWMU. In addition, no watercourses or isolated aquatic natural resources (i.e., wetlands) were observed at or in the immediate vicinity to SWMU 75.

5.2 Geology/Hydrogeology

The following sections discuss the geology and hydrogeology in the vicinity of SWMU 75.

5.2.1 Geology

SWMU 75 is located in a near-shore area within the Fueling Piers Area of the base. The near-shore areas include the shores of Ensenada Honda and Puerca Bay and typically include areas of mangrove swamp. The near-shore areas are typically underlain by marine sand layers (with coral and shell fragments), silt and clay layers, and occasional peat layers. In some near-shore areas, particularly by the harbor and Camp Moscrip in the southeastern portion of the base, fill material overlays the marine layers. The fill consists of rock fragments, debris (e.g., brick), sand, silt, and clay. However, SWMU 75 is located adjacent to Pier No. 3 where it appears that approximately ten feet of fill material (in the immediate vicinity of Building 803) was emplaced to support construction and operation of the pier.

Five soil borings (75SB01 through 75SB05) were advanced in the immediate vicinity of Building 803 at SWMU 75 during the Phase I RFI field investigation to profile surface and subsurface conditions (see Figure 4-1). Fill materials were observed at each boring including a thin layer of brown silt to gravel up to 1.3 feet thick overlying a generally consistent zone of beach sand fill. The beach sand fill consists of light tan silt to medium sand with some shell and coral fragments. The beach sand color graded to grey and olive at 11 feet bgs at 75SB01. This color change may be indicative of native marine deposits. Groundwater was observed around eight feet bgs within the beach sand fill. Boring logs are provided in Appendix B. Note that the datum plan used is the

Mean Low Water plus 100.00 foot as established by the U.S. Navy Survey Section (November 1941).

5.2.2 Hydrogeology

Monitoring well installation and groundwater sampling programs were not proposed as part of the SWMU 75 RFI. However, depth to groundwater measurements were collected from two existing monitoring wells (803-MW4 and 803-MW5) found on site from the 1994 Site Characterization Report (Blasland, Bouck, & Lee, 1994), and locations are shown on Figure 4-1. The field team was unable to locate monitoring wells 803-MW1 through 803-MW3, thus the location of these wells are not shown on Figure 4-1 and subsequent maps included as part of this report. Note that one of the three existing wells, designated 803-MW2 was identified during a January 2011 site visit. This well is located to the west of well 803-MW5. Groundwater level measurements were collected from the two wells at the end of the SWMU 75 Phase I field investigation on March 31, 2010. The groundwater level measurements are provided on Table 4-4 and in the field log books in Appendix B. A potentiometric surface/groundwater contour map was not developed as only two groundwater data stations were identified. The anticipated groundwater flow direction is westerly toward Encenada Honda. According to the 1994 Site Characterization Report the general groundwater flow direction is southwest toward Ensenada Honda. However, due to the Site's close proximity to Pier No. 3 and associated sea walls, the groundwater flow direction and gradients are likely variable and influenced by tides.

6.0 ANALYTICAL RESULTS

This section discusses the analytical results of environmental samples collected from SWMU 75 during the March 2010 Phase I RFI investigation. The validated analytical data tables for the Phase I RFI field effort are included in Appendix C. Relevant portions of the data validation reports for the Phase I RFI SDGs are provided in Appendix D.

6.1 Human Health and Ecological Screening Values

Detected compounds for each media are compared to applicable regulatory and background criteria. The rationale for using criteria for a specific medium are described in detail below.

6.1.1 Human Health Screening Values

Applicable human health criteria for soils include USEPA Regional Industrial Screening Levels (SLs) and USEPA Regional Residential SLs (USEPA, 2010), while applicable human health criteria for groundwater are USEPA Regional Tap Water SLs,, Federal Drinking Water Maximum Contaminant Levels (MCLs) (USEPA, 2009a), and the Puerto Rico Water Quality Standards (PRWQS) (PREQB, 2010).

6.1.1.1 Regional Screening Levels

The Regional SLs were developed by the USEPA to support the risk assessment screening process, while improving consistency across USEPA Regions and incorporating updated guidance in a timely manner. The Regional SL Table was developed with the Department of Energy's Oak Ridge National Laboratory under an Interagency Agreement as an update of the individual screening tables that had previously been maintained by Regions 3, 4, and 9. As recommended by the USEPA, these Regional SLs are to replace all other screening values.

The Regional SL Table contains risk-based screening levels derived from standardized equations (representing ingestion, dermal contact, and inhalation exposure pathways), calculated using the latest toxicity values, default exposure assumptions and physical and chemical properties. The SLs contained in the Regional SL Table are generic; they are calculated without site-specific information. Regional SLs should be viewed as Agency guidelines, not legally enforceable standards. The SLs for potentially carcinogenic chemicals are based on a target Incremental Lifetime Cancer Risk (ILCR) of $1x10^{-06}$. The SLs for noncarcinogens are based on a target hazard quotient (HQ) of 1.0. However, in order to account for cumulative risk from multiple chemicals in a medium, the noncarcinogenic SLs were divided by a factor of ten, yielding a target HQ of 0.1. For potential carcinogens, the toxicity criteria applicable to the derivation of SL values are oral Cancer Slope Factors (CSFs) and inhalation unit risk (IUR) factors; for noncarcinogens, they are chronic oral reference doses (RfDs) and inhalation reference concentrations (RfCs). These toxicity criteria are subject to change as more updated information and results from the most recent toxicological/epidemiological studies become available. The Regional SL Table is updated periodically to reflect such changes. It should be noted that the most recent Regional SL Table update available at this time is from May 2010 (USEPA, 2010).

6.1.2 Ecological Screening Values

The sections that follow describe the various criteria and toxicological benchmarks that were used as ecological-based media-specific screening values for chemicals in soil surface and subsurface soil.

6.1.2.1 Soil Screening Values

USEPA ecological soil screening levels (Eco-SSLs) (documentation available at http://www.epa.gov/ecotox/ecossl/) were preferentially used as soil screening values. Eco-SSLs have been developed for eight receptor groups: plants, soil invertebrates, avian herbivores, avian ground insectivores, avian carnivores, mammalian herbivores, mammalian ground insectivores, and mammalian carnivores. For a given chemical, the lowest Eco-SSL value for plants, soil invertebrates, avian herbivores, avian ground insectivores, avian carnivores, mammalian herbivores was selected as the soil screening value. Eco-SSLs for mammalian ground insectivores were not considered for soil screening value development because there are no mammalian ground insectivores in Puerto Rico (mammalian insectivores are limited to aerial insectivores [i.e., bats]). As discussed in Guidelines for Developing Ecological Soil Screening Levels (USEPA, 2005), aerial and arboreal insectivorous birds and mammals were excluded from Eco-SSL development because they are considered inappropriate (i.e., they do not have a clear or indirect exposure pathway link to soil [indirect exposure pathways involve ingestion of prey that have direct contact with soil]). Eco-SSLs for mammalian carnivores also were not considered for soil screening value development because there are no carnivorous mammals on Puerto Rico. With the exception of bats, the terrestrial mammals represented by potentially complete exposure pathways are limited to nonindigenous, nuisance species (i.e., Norway rat, black rat, and mongoose) that have been implicated in the decline of native reptilian and bird populations (Mac et al., 1998 and United States Fish and Wildlife Service [USFWS], 1996). Eco-SSLs for mammalian herbivores are considered appropriate for soil screening value development based on the presence of fruit-eating and nectivorous bats in Puerto Rico.

For those chemicals lacking plant, soil invertebrate, avian herbivore, avian ground insectivore, avian carnivore, or mammalian herbivore Eco-SSLs, the literature-based toxicological benchmarks listed below were used as soil screening values.

- Toxicological thresholds for earthworms and microorganisms (Efroymson et al., 1997a)
- Toxicological thresholds for plants (Efroymson et al., 1997b)

Identical to the Eco-SSLs, when more than one screening value was available for a given chemical from Efroymson et al. (1997a and 1997b), the lowest value was selected as the soil screening value. For those chemicals lacking plant, soil invertebrate, avian herbivore, avian ground insectivore, avian carnivore, or mammalian herbivore Eco-SSL and a toxicological threshold from Efroymson et al. (1997a and 1997b), the following literature-based values, listed in their order of decreasing preference, were used as soil screening values:

- Toxicity reference values for plants and invertebrates listed in USEPA (1999)
- Soil standards developed by the Ministry of Housing, Spatial Planning and Environment (MHSPE, 2000)
- Canadian soil quality guidelines (agricultural land use) developed by the Canadian Council of Ministers of the Environment (CCME, 2007)

Soil screening values based on MHSPE soil standards represent an average of the target and intervention soil standards. Values are based on a default organic carbon content of 2.0 percent, which represents the minimum adjustment range (2.0 to 30.0 percent). Soil screening values developed by CCME soil quality guidelines were given the lowest preference since many are background-based interim guidelines that do not represent effect-based concentrations.

6.1.3 Background Screening Values

For a given medium (i.e., soil and groundwater), analytical data for inorganic chemicals exceeding one or more of the screening values (human health or ecological) was be compared to NAPR background screening values (i.e., upper limit of the mean [ULM] background concentrations). The ULM background concentrations used in the evaluations are those derived from the inorganic data sets contained in the Revised Final II Summary Report for Environmental Background Concentrations of Inorganic Compounds, (Baker, 2010a). The background screening values for the fine sand/silt subsurface soil type were used for this Phase I RFI.

6.2 Surface Soil

Five surface soil samples (75SB01-00 through 75SB05-00) and one field duplicate sample (75SB04-00D) were collected and analyzed during the Phase I RFI. All surface soil samples were analyzed for Appendix IX VOCs, SVOCs including low-level PAHs, TPH GRO and DRO, and metals. Table 6-1 presents detected analytical results compared to screening criteria described in Section 6.1.

VOCs were not detected in the surface soil samples.

Twenty SVOCs were detected in the surface soil at SWMU 75. Five LLPAHs exceeded the screening criteria in one or more of the surface soil samples collected, as shown in Table 6-1 and on Figure 6-1, including:

- Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene, were reported at concentrations exceeding the USEPA Regional Residential SLs for sample 75SB01-00; benzo(a)pyrene also exceeded the USEPA Industrial SL. Sample 75SB01-00 is located along the eastern side of Building 803, also adjacent to Building 896.(an open structure which covers SWMU 74 fuel pipelines and valves).

- Sample 75SB03-00, exceeded Regional Residential SL for benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd) pyrene. This sample is located south of Building 803 and 896.

- Sample 75SB05-00, exceeded Regional Residential SL for benzo(a)pyrene, and dibenz(a,h)anthracene. Although there were no reported organic exceedances in surface soil sample 75SB04-00, the duplicate sample exceeded the Residential SL for benzo(a)pyrene. These samples are located along the western side of Building 803.

A comparison of the sum of the low molecular weight PAHS and the high molecular weight PAHs to ecological screening criteria did not result in concentrations above the screening values.

TPH DRO was detected in two samples, below screening criteria. TPH GRO was not detected in any of the surface soil samples as shown on Table 6-1.

Fifteen inorganic compounds were detected in the surface soil at SWMU 75, as shown on Table 6-1. Seven inorganic parameters exceeded one or more of the screening criteria including:

- Arsenic
- Cadmium
- Cobalt

- Copper
- Lead
- Vanadium
- Zinc

Arsenic exceeded the Regional residential and industrial SLs as well as the Base background screening values at two locations (75SB02 and 75SB05). Cadmium at 75SB01 and copper at 75SB04 exceeded the associated ecological screening value but were below the Base background screening levels. Cobalt exceeded the residential Regional SL at three locations and the ecological screening value at one location, but was below Base background screening levels. Lead was detected at a concentration in excess of the selected ecological screening as well as the Base background screening values in 75SB01 and 75SB03. Note that the lead data for sample 75SB04-00 and duplicate sample 75SB04-00D were rejected and is not usable (i.e., the primary and duplicate samples exhibited a non-compliant absolute difference result). Vanadium exceeded the Regional residential and industrial SLs and the ecological screening values at all but one location (75SB02-00); however, the concentrations were below the Base background screening values. Zinc was detected above ecological screening values in three samples, but was below Base screening values. Figure 6-2 presents the locations of inorganic parameters that exceeded ecological or human health screening criteria and Base background values.

Information obtained to date indicates that the lateral extent of potential surface soil contamination has not been fully defined. Based on the exceedances of background and regulatory screening criteria in the surface soil of this industrial area, it appears that SVOC benzo(a)pyrene and lead contamination may have occurred in the surface soil (near the doorway of Building 803 [75SB01]) due to past activities at SWMU 75. Although a few additional SVOCs and metals exceeded one or more of the regulatory screening criteria, the reported SVOC concentrations did not exceed the Regional Industrial SLs, and the reported metal concentrations were generally below the Base background screening values. Some of these SVOCs and metals may be a result of anthropogenic influences due to the industrial nature of the area and presence of ubiquitous fill material, and not a result of a direct release from the SWMU. These anthropogenic relationships should be furthered explored during the Full RFI Investigation.

6.3 Subsurface Soil

Nine subsurface soil samples (and one duplicate) were collected and analyzed during the Phase I RFI for Appendix IX VOCs, SVOCs with LLPAHs, TPH DRO and GRO, and metals. Detected results for the subsurface soil data set are presented in Table 6-2.

VOCs were not detected in the subsurface soil samples.

A total of fifteen SVOCs were detected in the subsurface soil samples. Benzo(a)pyrene and was detected in 75SB01-01, 75SB02-01, 75SB04-04 and 75SB05-01 above Regional Residential SLs. Dibenz(a,h)anthracene was detected in 75SB01-01 and 75SB05-01 above Regional Residential SLs. A comparison of the sum of the low molecular weight PAHs and the high molecular weight PAHs to ecological screening criteria did not result in concentrations above the screening values. Figure 6-3 shows the LLPAHs detected above screening levels.

TPH DRO was detected in one sample (75SB01-01), below screening criteria. TPH GRO was not detected in any of the subsurface soil samples, as shown on Table 6-2.

Seventeen metals were detected in subsurface soil samples as shown on Table 6-2. Eight inorganic parameters exceeded one or more of the screening criteria including:

- Arsenic
- Cadmium
- Cobalt
- Copper
- Lead
- Selenium
- Vanadium
- Zinc

However, only arsenic, cadmium, lead and zinc were detected at concentrations above Base background. Arsenic was detected in sample 75SB04-01 at 13.3 J mg/kg above the regional residential and industrial SLs as well as the Base background screening value. Cadmium in sample 75-SB01-01 (0.95 mg/kg) was detected above Base background and its ecological screening value. Lead was detected above Base background and ecological screening values in three samples: 75SB01-01, the duplicate for 75SB01-01 and 75SB02-01. Zinc was detected above Base background and its ecological screening value in sample 75SB01-01. Figure 6-4 shows the detected inorganics detected above screening levels and Base background screening numbers.

Information obtained to date indicates that the lateral extent of potential subsurface soil contamination has not been fully defined. Based on the exceedances of background and/or regulatory screening criteria in the shallow subsurface soil of this industrial area, it appears that metals contamination (cadmium, lead, and zinc near the doorway of Building 803 [75SB01] and arsenic near the northwest corner of Building 803 [75SB04]) may have occurred in the shallow subsurface soil due to past activities at SWMU 75. Although reported concentrations for SVOCs exceeded the associated Regional Residential SLs in the subsurface soil, the Regional Industrial SLs were not exceeded for any sample. Some of these SVOCs and metals may be a result of anthropogenic influences due to the industrial nature of the area and presence of ubiquitous fill material, and not a result of a direct release from the SWMU. These anthropogenic relationships should be furthered explored during the Full RFI Investigation.

6.4 Laboratory Data Validation Summary

A discussion of the compounds detected in the field QA/QC samples is presented in Section 6.4.1. A summary of the data validation findings is provided in Section 6.4.2. Data validation reports are included in Appendix C. In addition, the Puerto Rican Chemist Certification for each CompuChem SDG also is presented in Appendix D.

6.4.1 Summary of Detected Compounds in Field QA/QC Samples

Field generated QA/QC samples for the Phase I RFI field effort consisted of one field blank (75FB01), one trip blank (75TB01), and one equipment rinsate (75ER01) sample. 75TB01 was analyzed for VOCs and TPH GRO. The other blanks were analyzed for VOCs, SVOCs with LLPAHs, TPH DRO and GRO, and total metals. Table 6-3 presents the detected compounds found in the trip blank, equipment rinsate, and field blanks. Detections in the QA/Qc samples included nine VOCs (2-butanone, acetone, benzene, chloroform, ethylbenzene, methylene chloride, toluene, m/p-xylene, and o-xylene), one SVOC (naphthalene), and TPH GRO. The detections in the QA/QC samples did not negatively impact the environmental data.

6.4.2 Validation Summary

Laboratory analyses were performed by CompuChem, a Division of Liberty Analytical Corporation located in Cary, North Carolina. Validation services were provided by DataQual Environmental Services, LLC located in St. Louis, Missouri. Validation narratives for the two SDGs for SWMU 75 are provided in Appendix D. The validation indicted that all sample preparation and analysis was performed within Region II and/or method holding time requirements. Changes in the results due to the application of the data validation objectives are not expected to significantly compromise the data quality objectives for this SWMU. Consequently, the data, as qualified by the validator is acceptable for its intended use. Note that the SVOC quantitation limits are generally higher than those listed in Table 4-3. Although the reported SVOC quantization limits are higher than those listed on Table 4-3, none are greater than the lowest associated risk-based standard (i.e., typically the USEPA Regional Residential Screening Levels [SLs] but for some constituents the selected ecological soil screening value). Consequently, the higher SVOC quantitation limits did not adversely impact achievement of the risk-based standards.

The EPA and PREQB commented that the soil samples for GRO analysis were collected in 4-oz. jars with no preservative and consequently, these data should be rejected due to lack of preservation, as per EPA Region 2 VOC validation guidelines. Since these soil samples were also analyzed by Method 8260B for VOCs, the analytical laboratory re-evaluated the GC/MS (8260B) analytical data and produced TIC information on those samples that had been analyzed for GRO using Method 8015B/C and concluded that the soil samples for GRO analysis were not compromised due to the collection procedure and lack of field preservation. As requested by PREQB the complete discussion is provided below for clarity and transparency (PREQB comments are in italics and the Navy's responses are in plain text):

> ***Appendix B, Chain of Custody Forms***
>
> *1. According to the chains-of-custody, soil samples for GRO analysis were collected in 4-oz. jars with no preservative. According to the analytical method (SW-846 5035/8015B) and Chapter 4 of SW-846, these samples should be collected in preservative similar to VOC soil samples since GRO is a volatile parameter. Without the preservation, sample results are not reliable and should not be used for decision-making purposes. Please explain why these samples were not preserved and revise all tables and validation reports to qualify these data as rejected due to the lack of preservation, as per EPA Region 2 VOC validation guidelines.*
>
> **Navy Response to PREQB Comment 1, Appendix B:** CompuChem was the laboratory utilized for this project and they provided Michael Baker Corporation personnel 2oz and 4 oz jars for collection of samples for GRO determination. The sampling containers were provided so that CompuChem could employ SW 846 Method 5035, Section 6.2.3. CompuChem made the decision to provide the jars for collection because the Project Action Limits were expressed as 250mg/Kg. Since 200mg/Kg is considered "High Concentration" CompuChem intended to use method 5035 for collection and analysis of samples, however the lab determined that the volatile compound concentrations in these samples were not high concentration, therefore they decided to prepare and analyze the samples using low concentration techniques.
>
> All samples were continually maintained at 4ºC ±2ºC, without opening or transferring any sample until the actual time of analysis, in order to prevent/minimize volatile loss in the laboratory during sample storage prior to analysis. The sample collection jars have a

Teflon seal in the cap for the prevention of loss of volatile compounds. CompuChem used SW 846 Method 5030B, Section 6.2.1 to prepare the sample for analysis. The samples were analyzed immediately following the preparation. CompuChem interprets the method to allow preparation options for the analysis of volatile compounds (GRO). CompuChem determined that since SW 846 Method 5035, Section 6.2.3 was used for sampling, they could choose to use SW 846 Method 5030 for sample preparation, if, in their judgement, the samples did not contain high concentrations of volatile compounds. CompuChem's determination to use method 5030 is based on the interest to provide useable data at lower concentrations. Application of the criteria for 5030B, as stated in section 6.2 indicates that samples have a 14 day holding time from sampling to analysis. All samples analyzed by CompuChem for this project met the 14 day holding time indicated in the method.

All of the GRO results for this site were reported as non-detect. As stated in the data validation report for CompuChem SDG 1003252 "Soil samples were collected in unpreserved 4-0z jars and analyzed on days 10 and 11; therefore results were qualified as estimated and considered biased low." Consequently, the sample collection and preservation for GRO is appropriate and acceptable according to the referenced method. Note however, that 60 ml vial with appropriate preservative will be used for future GRO analyses of soils if this laboratory is selected for future work.

PREQB Evaluation of Response: *It appears that the laboratory provided Michael Baker Corporation with the incorrect bottles/preservatives for the collection of soil samples for GRO analysis. Although Section 6.2.3 of SW-846 Method 5035 allows for collection of an unpreserved soil sample, this is not allowed by EPA Region 2 and is only ever allowed per the method when one knows that the concentrations will be significantly elevated. When the "high concentration" method is needed, the required collection procedure would be to collect an undisturbed sample and preserve this in methanol. Although all samples were maintained at 4ºC ±2ºC without opening or transferring any sample until the actual time of analysis, samples were significantly compromised and the potential for volatilization was significant based on the collection procedure and the lack of field preservation. Note that:*

- *Volatilization will occur due to the collection of a "disturbed" sample versus the 5035 requirement for a collection of an undisturbed sample.*
- *When the laboratory opened the container to prepare the sample for analysis as well as during the laboratory subsampling procedure, this further compromised the sample. Current procedures do not even allow the container to be opened after collection. Please note that the low-level method utilizes a hermetically-sealed sample vial, the seal of which is never broken from the time of sampling to the time of analysis. Since the sample is never exposed to the atmosphere after sampling, the losses of VOCs during sample transport, handling, and analysis are minimized.*
- *Volatilization of the sample can also occur from exposure of the solid surface near the time of collection.*
- *Volatilization can occur from failed seals on the Teflon-lined caps of the bottles or VOA vials.*
- *Since samples were not chemically preserved upon collection, biodegradation during storage is possible.*

The above issues, combined with the fact that there were 10-11 days between collection and analysis, further supports the need to reject all nondetect GRO data collected for this

investigation. These issues render the GRO data unusable for project objectives. Please revise the results accordingly and discuss the effects on the achievement of the project objectives.

Navy Response to PREQB Comment 1, Appendix B: GRO analysis in soil samples is typically conducted using Method 8015B/C. This analysis is based on summing the chromatographable constituents that elute between certain retention time markers. However, the analysis does not provide any information on the specific constituents of the GRO. Gasoline consists of a mixture of aliphatic and aromatic compounds including straight chain, branched, and cyclic alkanes. The typical contaminants of concern in gasoline are benzene, toluene, ethylbenzene, and xylenes (BTEX) as well as naphthalene and methyl tertiary butyl ether. All of these compounds are target analytes for analysis conducted using Method 8260B. Other components of gasoline can also be assessed as Tentatively Identified Compounds (TICs) in the analysis. All extraneous peaks in a GC/MS analyses can be library searched, and depending on the purity of the match fit, the unknown peak can be identified. Aside from producing the library search information, a total alkanes amount can also be assessed.

Since all of the soil samples in question were also analyzed for Appendix IX VOCs, CompuChem was requested to re-evaluate the GC/MS (8260B) analytical data and produce TIC information on those samples that had been analyzed for GRO using Method 8015B/C. The results of the re-evaluation were as follows:

- There were no BTEX compounds detected above the Reporting Limit (RL) of 5 µg/kg in any of the samples. The Maximum Permissible Level (MPL) for GRO in soil is 250 mg/kg.

- A GRO standard at 0.5 mg/kg was analyzed using the GC/MS. The Reconstructed Ion Chromatogram (RIC) from the GRO standard was then compared to the RIC for the samples. None of the samples displayed the same matrix as the GRO standard.

- TIC searches were conducted for all samples to determine if a mixture of aliphatic and aromatic compounds including straight chain, branched, and cyclic alkanes were present. None of the samples contained enough TICs to confirm GRO, let alone GRO constituents approaching anywhere near a total of 250 mg/kg.

Based on the results of this re-evaluation, the soil samples for GRO analysis were not compromised due to the collection procedure and lack of field preservation. The data are considered usable, as qualified by the validator, for its intended purpose. However, as previously indicated, vials with the appropriate preservative will be used for future GRO analysis of soils. No changes to the text are warranted.

PREQB Evaluation of Response (provided via email from Gloria Toro Agrait on September 8, 2011): *Please include the evaluation discussed in the above response in the text of the report for clarity and transparency.*

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

The analysis of samples obtained during the Phase I RFI investigation indicates that surface and subsurface soil may have been impacted from past activities at SWMU 75. Comparison of the analytical results to the project screening criteria revealed the following conclusions regarding potential impacts:

Surface Soil

- Five SVOC LLPAHs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd) pyrene exceeded the Regional residential SLs in one or more of the surface soil samples collected. Benzo(a)pyrene exceeded the Regional industrial SL in sample 75SB01.

- Arsenic, cadmium, cobalt, copper, lead, vanadium, and zinc were reported at concentrations exceeding one or more of the screening values for the surface soil samples.

- It appears that benzo(a)pyrene and lead contamination may have occurred in the surface soil (near the doorway of Building 803 [75SB01]) due to past activities at SWMU 75. Although a few additional SVOCs and metals exceeded one or more of the regulatory screening criteria, the reported SVOC concentrations did not exceed the Regional Industrial SLs, and the reported metal concentrations were generally below the Base background screening values. Some of these SVOCs and metals may be a result of anthropogenic influences due to the industrial nature of the area and presence of ubiquitous fill material, and not a result of a direct release from the SWMU. These anthropogenic relationships should be furthered explored during the Full RFI Investigation.

Subsurface Soil

- Four SVOC LLPAHs including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene exceeded the Regional residential SLs in one or more of the surface soil samples collected. Benzo(a)pyrene exceeded the Regional industrial SL in sample 75SB01.

- Arsenic, cadmium, cobalt, copper, lead, selenium, vanadium, and zinc were reported at concentrations exceeding one or more of the screening values for the subsurface soil samples.

- It appears that metals contamination (cadmium, lead, and zinc near the doorway of Building 803 [75SB01] and arsenic near the northwest corner of Building 803 [75SB04]) may have occurred in the shallow subsurface soil due to past activities at SWMU 75. Although reported concentrations for SVOCs exceeded the associated Regional Residential SLs in the subsurface soil, the Regional Industrial SLs were not exceeded for any sample. Some of these SVOCs and metals may be a result of anthropogenic influences due to the industrial nature of the area and presence of ubiquitous fill material, and not a result of a direct release from the SWMU. These anthropogenic relationships should be furthered explored during the Full RFI Investigation.

Soil boring 75SB03 was moved from its proposed sidegradient location due to DPT drill rig inaccessibility and overall safety; a narrow amount of space between Buildings 803 and 896, and the presence of electrical equipment used to service Building 896 precluded drilling from this area. Therefore, soil boring 75SB03 was moved to a location on the east side of Building 896 which covers SWMU 74 fuel pipelines and valves. Upon further review of the soil boring 75SB03 location, it is evident that this data station is not representative of SWMU 75 and potential releases from Building 803. Proposed Phase II CMS activities at the Fueling Piers Area of SWMU 74 will include further characterization of surface soil (Baker, 2010). The Fueling Piers Area of SWMU 74 includes soil boring 75SB03.

7.2 Recommendations

Impacts to the environment appear to have occurred at SWMU 75. Information obtained to date indicates that the lateral extent of surface and shallow subsurface soil contamination has not been fully defined. A Full RFI Investigation, requiring limited sampling and analysis, is recommended to characterize the nature and extent of impacts to the surface and shallow subsurface soil at two locations within SWMU 75.

The Full RFI should include sampling of the surface soil and subsurface soil in the vicinity of Phase I RFI sample locations 75SB01, 75SB04, and 75SB05 for analysis of LLPAHs, Appendix IX metals. Figure 7-1 shows the proposed soil sample locations. Surface soil sample 75SB04-00 should also be recollected and analyzed for lead since the lead data for this sample was rejected and is not usable. In addition, attempts to locate and evaluated existing wells 803-MW1 and 803-MW3 will be made prior to development of the Full RFI Work Plan. The Full RFI work plan will outline the sampling of groundwater from all five existing wells, assuming the remaining two wells are located and not compromised. If the two existing wells are not located, the installation of two new wells and sampling of five total wells including the three existing and two new wells will be proposed. The groundwater samples will be analyzed for LLPAHs and Appendix IX metals.

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TABLES

TABLE 4-1

SUMMARY OF SAMPLING AND ANALYTICAL PROGRAM - ENVIRONMENTAL SAMPLES
SWMU 75 - BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

					Analysis Requested					
Sample Media	**Site ID**	**Sample ID**	**Sample Depth**	**Sample Date**	App IX VOCs	App IX SVOCs with Low-Level PAHs	App IX Metals (Total)	TPH DRO	TPH GRO	**Comment**
Surface Soil Samples	75SB01	75SB01-00	0.0 - 1.0	3/29/10	X	X	X	X	X	
	75SB02	75SB02-00	0.0 - 1.0	3/29/10	X	X	X	X	X	
	75SB03	75SB03-00	0.0 - 1.0	3/29/10	X	X	X	X	X	
	75SB04	75SB04-00	0.0 - 1.0	3/29/10	X	X	X	X	X	
		75SB04-00D	0.0 - 1.0	3/29/10	X	X	X	X	X	Duplicate
	75SB05	75SB05-00	0.0 - 1.0	3/29/10	X	X	X	X	X	
Subsurface Soil Samples	75SB01	75SB01-01	1.0 - 3.0	3/29/10	X	X	X	X	X	
		75SB01-01D	1.0 - 3.0	3/29/10	X	X	X	X	X	Duplicate
		75SB01-04	7.0 - 9.0	3/29/10	X	X	X	X	X	
	75SB02	75SB02-01	1.0 - 3.0	3/29/10	X	X	X	X	X	
		75SB02-04	7.0 - 9.0	3/29/10	X	X	X	X	X	
	75SB03	75SB03-01	1.0 - 3.0	3/29/10	X	X	X	X	X	
		75SB03-04	7.0 - 9.0	3/29/10	X	X	X	X	X	
	75SB04	75SB04-01	1.0 - 3.0	3/29/10	X	X	X	X	X	
		75SB04-01MS/MSD	1.0 - 3.0	3/29/10	X	X	X	X	X	Matrix Spike/Matrix Spike Duplicate
		75SB04-04	7.0 - 9.0	3/29/10	X	X	X	X	X	
	75SB05	75SB05-01	1.0 - 3.0	3/29/10	X	X	X	X	X	

Notes:
ft bgs - feet below ground surface.
App IX - Appendix IX
PAHs - Polynuclear Aromatic Hydrocarbons

TABLE 4-2

SUMMARY OF SAMPLING AND ANALYTICAL PROGRAM - QA/QC SAMPLES
SWMU 75 - BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

			Analysis Requested					
Media	**Sample ID**	**Sample Date**	App IX VOCs	App IX SVOCs with Low-Level PAHs	App IX Metals (Total)	TPH DRO	TPH GRO	**Comment**
Trip Blank	75TB01	3/29/2010	X				X	
Equipment Rinsate Blank	75ER01	3/29/2010	X	X	X	X	X	Macro Core Liner
Field Blank	75FB01	3/29/2010	X	X	X	X	X	Lab Grade Deionized Water

Notes:
App IX - Appendix IX
PAHs - Polynuclear Aromatic Hydrocarbons

TABLE 4-3

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 75 -BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

	Quantitation Limits*			Preparation Methods		
Volatiles	Water (µg/L)	Low Soil (µg/kg)	Method Number	Water	Soil	Method Description
Acetone	25	50	8260B	5030 B	5035	GC / MS
Acetonitrile	40	200	8260B	5030 B	5035	GC / MS
Acrolein	20	100	8260B	5030 B	5035	GC / MS
Acrylonitrile	20	100	8260B	5030 B	5035	GC / MS
Benzene	1.0	5.0	8260B	5030 B	5035	GC / MS
Bromodichloromethane	1.0	5.0	8260B	5030 B	5035	GC / MS
Bromoform	1.0	5.0	8260B	5030 B	5035	GC / MS
Bromomethane	1.0	10	8260B	5030 B	5035	GC / MS
Carbon Disulfide	1.0	5.0	8260B	5030 B	5035	GC / MS
Carbon Tetrachloride	1.0	5.0	8260B	5030 B	5035	GC / MS
Chlorobenzene	1.0	5.0	8260B	5030 B	5035	GC / MS
Chloroethane	1.0	10	8260B	5030 B	5035	GC / MS
Chloroform	1.0	5.0	8260B	5030 B	5035	GC / MS
Chloromethane	1.0	10	8260B	5030 B	5035	GC / MS
Chloroprene	1.0	5.0	8260B	5030 B	5035	GC / MS
3-Chloro-1-propene	1.0	5.0	8260B	5030 B	5035	GC / MS
1,2-Dibromo-3-chloropropane	1.0	10	8260B	5030 B	5035	GC / MS
Dibromochloromethane	1.0	5.0	8260B	5030 B	5035	GC / MS
1,2-Dibromoethane	1.0	5.0	8260B	5030 B	5035	GC / MS
Dibromomethane	1.0	5.0	8260B	5030 B	5035	GC / MS
trans-1,4-Dichloro-2-butene	2.0	10	8260B	5030 B	5035	GC / MS
Dichlorodifluoromethane	1.0	5.0	8260B	5030 B	5035	GC / MS
1,1-Dichloroethane	1.0	5.0	8260B	5030 B	5035	GC / MS
1,2-Dichloroethane	1.0	5.0	8260B	5030 B	5035	GC / MS
trans-1,2-dichloroethene	1.0	5.0	8260B	5030 B	5035	GC / MS
1,1-Dichloroethene	1.0	5.0	8260B	5030 B	5035	GC / MS
Methylene Chloride	5.0	5.0	8260B	5030 B	5035	GC / MS
1,2-Dichloropropane	1.0	5.0	8260B	5030 B	5035	GC / MS
cis-1,3-Dichloropropene	1.0	5.0	8260B	5030 B	5035	GC / MS
trans-1,3-Dichloropropene	1.0	5.0	8260B	5030 B	5035	GC / MS
Ethyl benzene	1.0	5.0	8260B	5030 B	5035	GC / MS
Ethyl methacrylate	1.0	5.0	8260B	5030 B	5035	GC / MS
2-Hexanone	10	25	8260B	5030 B	5035	GC / MS
Iodomethane	5.0	5.0	8260B	5030 B	5035	GC / MS
Isobutanol	40	200	8260B	5030 B	5035	GC / MS
Methacrylonitrile	20	100	8260B	5030 B	5035	GC / MS
2-Butanone	10	25	8260B	5030 B	5035	GC / MS
Methyl methacrylate	1.0	5.0	8260B	5030 B	5035	GC / MS
4-Methyl-2-pentanone	10	25	8260B	5030 B	5035	GC / MS
Pentachloroethane	5.0	25	8260B	5030 B	5035	GC / MS
Propionitrile	20	100	8260B	5030 B	5035	GC / MS
Stryene	1.0	5.0	8260B	5030 B	5035	GC / MS
1,1,1,2-Tetrachloroethane	1.0	5.0	8260B	5030 B	5035	GC / MS
Tetrachloroethene	1.0	5.0	8260B	5030 B	5035	GC / MS
Toluene	1.0	5.0	8260B	5030 B	5035	GC / MS
1,1,1-Trichloroethane	1.0	5.0	8260B	5030 B	5035	GC / MS
1,1,2-Trichloroethane	1.0	5.0	8260B	5030 B	5035	GC / MS

TABLE 4-3

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 75 -BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

	Quantitation Limits*			Preparation Methods		
Volatiles (Cont.)	Water (µg/L)	Low Soil (µg/kg)	Method Number	Water	Soil	Method Description
Trichloroethene	1.0	5.0	8260B	5030 B	5035	GC / MS
Trichlorofluoromethane	1.0	5.0	8260B	5030 B	5035	GC / MS
1,2,3-Trichloropropane	1.0	5.0	8260B	5030 B	5035	GC / MS
Vinyl Acetate	2.0	10	8260B	5030 B	5035	GC / MS
Vinyl Chloride	1.0	10	8260B	5030 B	5035	GC / MS
Xylene	2.0	10	8260B	5030 B	5035	GC / MS
	Low Level Quantitation Limits*			**Preparation Methods**		
Semivolatiles	Water (µg/L)	Low Soil (µg/kg)	Method Number	Water	Soil	Method Description
Acenaphthene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
Acenaphthylene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
Acetophenone	1	33	8270D	3520 C	3550 B	GC/ MS
2-Acetylaminofluorene	1	33	8270D	3520 C	3550 B	GC/ MS
4-Aminobiphenyl	5	66	8270D	3520 C	3550 B	GC/ MS
Aniline	2	66	8270D	3520 C	3550 B	GC/ MS
Anthracene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
Aramite	1.5	66	8270D	3520 C	3550 B	GC/ MS
Benzo(a)anthracene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
Benzo(b)fluoranthene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
Benzo(k)fluoranthene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
Benzo(g,h,i)perylene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
Benzo(a)pyrene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
Benzyl alcohol	1	33	8270D	3520 C	3550 B	GC/ MS
Bis(2-chloroethoxyl)methane	1	33	8270D	3520 C	3550 B	GC/ MS
Bis(2-chloroethyl)ether	1	33	8270D	3520 C	3550 B	GC/ MS
Bis(2-ethylhexyl)phthalate	2	33	8270D	3520 C	3550 B	GC/ MS
4-Bromophenyl phenyl ether	1	33	8270D	3520 C	3550 B	GC/ MS
Butylbenzylphthalate	1	33	8270D	3520 C	3550 B	GC/ MS
4-Chloroaniline	2	66	8270D	3520 C	3550 B	GC/ MS
4-Chloro-3-methylphenol	1	33	8270D	3520 C	3550 B	GC/ MS
2-Chloronaphthalene	1	33	8270D	3520 C	3550 B	GC/ MS
2-Chlorophenol	1	33	8270D	3520 C	3550 B	GC/ MS
4-Chlorophenyl phenyl ether	1	33	8270D	3520 C	3550 B	GC/ MS
Chrysene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
3&4 Methylphenol	2	33	8270D	3520 C	3550 B	GC/ MS
2-Methylphenol	2	33	8270D	3520 C	3550 B	GC/ MS
Diallate	1	33	8270D	3520 C	3550 B	GC/ MS
Dibenzofuran	1	33	8270D	3520 C	3550 B	GC/ MS
Di-n-butyl phthalate	1	170	8270D	3520 C	3550 B	GC/ MS
Dibenzo(a,h)anthracene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
o-Dichlorobenzene	1	33	8270D	3520 C	3550 B	GC/ MS
m-Dichlorobenzene	1	33	8270D	3520 C	3550 B	GC/ MS
p-Dichlorobenzene	1	33	8270D	3520 C	3550 B	GC/ MS
3,3'-Dichlorobenzidine	20	66	8270D	3520 C	3550 B	GC/ MS
2,4-Dichlorophenol	1	33	8270D	3520 C	3550 B	GC/ MS
2,6-Dichlorophenol	1	33	8270D	3520 C	3550 B	GC/ MS
Diethylphthalate	1	33	8270D	3520 C	3550 B	GC/ MS

TABLE 4-3

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 75 -BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

	Low Level Quantitation Limits*			Preparation Methods		
Semivolatiles (Cont.)	Water (µg/L)	Low Soil (µg/kg)	Method Number	Water	Soil	Method Description
p-(Dimethylamino)azobenzene	5	33	8270D	3520 C	3550 B	GC/ MS
7,12-Dimethyl benz(a)anthracen	1	33	8270D	3520 C	3550 B	GC/ MS
3,3-Dimethyl benzidine	20	660	8270D	3520 C	3550 B	GC/ MS
2,4-Dimethylphenol	2	66	8270D	3520 C	3550 B	GC/ MS
alpha, alpha-Dimethylphenethyl	10	67,000	8270D	3520 C	3550 B	GC/ MS
Dimethyl phthalate	1	33	8270D	3520 C	3550 B	GC/ MS
m-Dinitrobenzene	1	33	8270D	3520 C	3550 B	GC/ MS
4,6-Dinitro-2-methylphenol	5	170	8270D	3520 C	3550 B	GC/ MS
2,4-Dinitrophenol	10	330	8270D	3520 C	3550 B	GC/ MS
2,4-Dinitrotoluene	1	33	8270D	3520 C	3550 B	GC/ MS
2,6-Dinitrotoluene	1	33	8270D	3520 C	3550 B	GC/ MS
Di-n-octylphthalate	1	33	8270D	3520 C	3550 B	GC/ MS
1,4-Dioxane	2	33	8270D	3520 C	3550 B	GC/ MS
Dinoseb	2	66	8270D	3520 C	3550 B	GC/ MS
Ethylmethanesulfonate	2	66	8270D	3520 C	3550 B	GC/ MS
Fluoranthene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
Fluorene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
Hexachlorobenzene	1	33	8270D	3520 C	3550 B	GC/ MS
Hexachlorobutadiene	1	33	8270D	3520 C	3550 B	GC/ MS
Hexachlorocyclopentadiene	2	66	8270D	3520 C	3550 B	GC/ MS
Hexachloroethane	1	33	8270D	3520 C	3550 B	GC/ MS
Hexachlorophene	500	17,000	8270D	3520 C	3550 B	GC/ MS
Hexachloropropene	1	33	8270D	3520 C	3550 B	GC/ MS
Indeno(1,2,3-cd)pyrene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
Isophorone	1	33	8270D	3520 C	3550 B	GC/ MS
Isosafrole	1	33	8270D	3520 C	3550 B	GC/ MS
Methapyrilene	200	6,700	8270D	3520 C	3550 B	GC/ MS
3-Methylcholanthrene	1	33	8270D	3520 C	3550 B	GC/ MS
Methyl methanesulfonate	2	33	8270D	3520 C	3550 B	GC/ MS
2-Methylnaphthalene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
Naphthalene	0.2	6.7	8270D	3520 C	3550 B	GC/ MS
1,4-Naphthoquinone	1	33	8270D	3520 C	3550 B	GC/ MS
1-Naphthylamine	5	66	8270D	3520 C	3550 B	GC/ MS
2-Naphthylamine	10	330	8270D	3520 C	3550 B	GC/ MS
2-Nitroaniline	1	170	8270D	3520 C	3550 B	GC/ MS
3-Nitroaniline	5	170	8270D	3520 C	3550 B	GC/ MS
4-Nitroaniline	5	170	8270D	3520 C	3550 B	GC/ MS
Nitrobenzene	1	33	8270D	3520 C	3550 B	GC/ MS
2-Nitrophenol	1	33	8270D	3520 C	3550 B	GC/ MS
4-Nitrophenol	5	170	8270D	3520 C	3550 B	GC/ MS
4-Nitroquinoline-1-oxide	2	33	8270D	3520 C	3550 B	GC/ MS
n-Nitrosodi-n-butylamine	1	33	8270D	3520 C	3550 B	GC/ MS
n-Nitrosodiethylamine	1	33	8270D	3520 C	3550 B	GC/ MS
n-Nitrosodimethylamine	1	33	8270D	3520 C	3550 B	GC/ MS
n-Nitrosodiphenylamine	1	33	8270D	3520 C	3550 B	GC/ MS
n-Nitrosodi-n-propylamine	1	33	8270D	3520 C	3550 B	GC/ MS

TABLE 4-3

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 75 -BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

	Low Level Quantitation Limits*			Preparation Methods		
Semivolatiles (Cont.)	**Water (µg/L)**	**Low Soil (µg/kg)**	**Method Number**	**Water**	**Soil**	**Method Description**
n-Nitrosomethylethylamine	2	33	8270D	3520C	3550B	GC/ MS
n-Nitrosomorpholine	1	33	8270D	3520C	3550B	GC/ MS
n-Nitrosopiperidine	1	33	8270D	3520C	3550B	GC/ MS
n-Nitrosopyrrolidine	1	33	8270D	3520C	3550B	GC/ MS
5-Nitro-o-toluidine	1	33	8270D	3520C	3550B	GC/ MS
bis-(2-chloroisopropyl)ether	1	33	8270D	3520C	3550B	GC/ MS
Pentachlorobenzene	1	33	8270D	3520C	3550B	GC/ MS
Pentachloronitrobenzene	1	33	8270D	3520C	3550B	GC/ MS
Pentachlorophenol	5	170	8270D	3520C	3550B	GC/ MS
Phenacetin	1	33	8270D	3520C	3550B	GC/ MS
Phenanthrene	0.2	6.7	8270D	3520C	3550B	GC/ MS
Phenol	1	33	8270D	3520C	3550B	GC/ MS
1,4-Phenylenediamine	20	170	8270D	3520C	3550B	GC/ MS
2-Picolin	2	66	8270D	3520C	3550B	GC/ MS
Pronamide	1	33	8270D	3520C	3550B	GC/ MS
Pyrene	0.2	6.7	8270D	3520C	3550B	GC/ MS
Pyridine	5	33	8270D	3520C	3550B	GC/ MS
Safrole	1	33	8270D	3520C	3550B	GC/ MS
1,2,4,5-Tetrachlorobenzene	1	33	8270D	3520C	3550B	GC/ MS
2,3,4,6-Tetrachlorophenol	1	33	8270D	3520C	3550B	GC/ MS
o-Toluidine	1	33	8270D	3520C	3550B	GC/ MS
1,2,4-Trichlorobenzene	1	33	8270D	3520C	3550B	GC/ MS
2,4,5-Trichlorophenol	1	33	8270D	3520C	3550B	GC/ MS
2,4,6-Trichlorophenol	1	33	8270D	3520C	3550B	GC/ MS
1,3,5-Trinitrobenzene	1	33	8270D	3520C	3550B	GC/ MS
	Quantitation Limits*			**Preparation Methods**		
Total Petroleum Hydrocarbons	**Water (µg/L)**	**Low Soil (µg/kg)**	**Method Number**	**Water**	**Soil**	**Method Description**
TPH DRO	100	3300	8015C	3520C	3550B	GC
TPH GRO	50	250	8015C	5030B	5035	GC
	Quantitation Limits*			**Preparation Methods**		
Inorganics	**Water (µg/L)**	**Low Soil (mg/kg)**	**Method Number**	**Water**	**Soil**	**Method Description**
Antimony	20	2.0	6020A	3005A	3050B	ICP/MS
Arsenic	10	1.0	6020A	3005A	3050B	ICP/MS
Barium	10	1.0	6020A	3005A	3050B	ICP/MS
Beryllium	4.0	0.4	6020A	3005A	3050B	ICP/MS
Cadmium	5.0	0.5	6020A	3005A	3050B	ICP/MS
Chromium	10	1.0	6020A	3005A	3050B	ICP/MS
Cobalt	10	1.0	6020A	3005A	3050B	ICP/MS
Copper	20	2.0	6020A	3005A	3050B	ICP/MS
Lead	5.0	0.5	6020A	3005A	3050B	ICP/MS
Mercury	0.2	0.02	7470A/7471A	7470A	7471A	Cold Vapor AA
Nickel	40	4.0	6020A	3005A	3050B	ICP/MS

TABLE 4-3

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 75 -BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

	Quantitation Limits*			Preparation Methods		
Inorganics	Water (µg/L)	Low Soil (mg/kg)	Method Number	Water	Soil	Method Description
Selenium	10	1.0	6020A	3005A	3050B	ICP/MS
Silver	10	1.0	6020A	3005A	3050B	ICP/MS
Thallium	10	1.0	6020A	3005A	3050B	ICP/MS
Tin	10	5.0	6010B	3010A	3050B	ICP/AES
Vanadium	10	1.0	6020A	3005A	3050B	ICP/MS
Zinc	20	2.0	6020A	3005A	3050B	ICP/MS

Notes:

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, will be higher.

µg/L - micrograms per liter.
µg/kg - micrograms per kilogram.
mg/kg - milligrams per kilogram.
mg/L - milligrams per liter
GC - Gas Chromotography
GC/MS - Gas Chromotography/Mass Spectrometry
ICP - Inductively Coupled Plasma
ICP/MS - Inductively Coupled Plasma - Mass Spectrometry

TABLE 4-4

SUMMARY OF SOIL BORING SPECIFICATIONS
SWMU 75 - BUILDING 803
PHASE I RCRA FIELD INVESTIGATION
NAVAL ACTIVITY PUERTO RICO
CEIBA, PUERTO RICO

Soil Boring Monitoring Well Designation	Ground Elevation (ft. datum)	Depth Feet (approx. bgs)	Bottom Elev. (ft. datum)
75SB01	110.0	12.0	98.04
75SB02	110.2	12.0	98.16
75SB03	110.0	12.0	97.98
75SB04	110.4	12.0	98.43
75SB05	109.9	4.0	105.89

Notes:
bgs = Below Ground Surface
SWMU 75 Phase I RFI field program implemented March 29, 2010.
The datum plan used is the Mean Low Water plus 100.00 foot as established by the U.S. Navy Survey Section (November 1941).
Existing monitoring well static water levels (SWLs) measured 3/31/10:
803 MW-4 (108.21 ft TOC/101.14 ft MSL)
804 MW-5 (108.33 ft TOC/101.09 ft MSL)

TABLE 6-1

Revised: March 1, 2011

SUMMARY OF DETECTED LABORATORY RESULTS - SURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	**Regional**	*Regional*	Selected		75SB01	75SB02	75SB03	75SB04	75SB04	75SB05
Sample ID	**Screening**	*Screening*	Ecological		75SB01-00	75SB02-00	75SB03-00	75SB04-00	75SB04-00D	75SB05-00
Sample Date	**Levels**	*Levels*	Soil	NAPR	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	**Residential**	*Industrial*	Screening	Basewide	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
	Soil	*Soil*	Values	Background [1]						
Volatiles (µg/kg)										
None detected										
Semivolatiles (µg/kg)										
2-Methylnaphthalene	31,000 [2]	410,000 [2]	NE	NE	9 U	9.9 U	9 U	8.8 U	0.72 J	9 U
Acenaphthene	340,000 [2]	3,300,000 [2]	NE	NE	42	9.9 U	9 U	8.8 U	8.7 U	9 U
Acenaphthylene	340,000 [2][3]	3,300,000 [2][3]	NE	NE	12	2.6 J	68	3.2 J	3.5 J	22
Anthracene	1,700,000 [2]	17,000,000 [2]	NE	NE	570	9.9 U	72	8.8 U	4.9 J	25
Benzo(a)anthracene	150	2,100	NE	NE	**1300** J	9.9 UJ	95 J	8.8 UJ	31	91 J
Benzo(a)pyrene	15.0	210	NE	NE	***840***	12	**130**	12 J	**34** J	**88**
Benzo(b)fluoranthene	150	2,100	NE	NE	**720**	9.6 J	**260**	18 JN	39 J	120 J
Benzo(g,h,i)perylene	170,000 [2][4]	1,700,000 [2][4]	NE	NE	460	15 J	310	38 J	31	56 J
Benzo(k)fluoranthene	1,500	21,000	NE	NE	1100 J	8.5 J	300	17 JN	47 J	110 J
Bis(2-ethylhexyl) Phthalate	35,000	120,000	6,010 [8][9]	NE	76 J	200 U	44 J	70 J	44 J	880
Butyl Benzyl Phthalate	260,000	910,000	6,010 [8][9]	NE	62 J	200 U	180 U	180 U	180 U	180 U
Chrysene	15,000	210,000	NE	NE	940	6.6 J	88	11 J	27 J	87
Dibenz(a,h)anthracene	15.0	210	NE	NE	**60** J	3.4 J	**36** J	8.8 U	8.7 U	**16** J
Dibenzofuran	7,800 [2]	100,000 [2]	NE	NE	30 J	200 U	180 U	180 U	180 U	180 U
Fluoranthene	230,000 [2]	2,200,000 [2]	NE	NE	2300 J	10	85	13 J	41 J	170
Fluorene	230,000 [2]	2,200,000 [2]	NE	NE	37	9.9 U	9 U	8.8 U	8.7 U	9 U
Indeno(1,2,3-cd)pyrene	150	2,100	NE	NE	**690** J	16 J	**330** J	18 J	30 J	80 J
Naphthalene	3,600	18,000	NE	NE	9 U	9.9 U	9 U	8.8 U	0.99 J	9 U
Phenanthrene	170,000 [2][4]	1,700,000 [2][4]	NE	NE	1700 J	9.9 U	13	8.8 U	3.9 J	15
Pyrene	170,000 [2]	1,700,000 [2]	NE	NE	1800 J	9.9 U	77	14 J	43 J	140
PAH totals (µg/kg)										
Low molecular weight PAHs	NE	NE	29,000 [10][11]	NE	4679	72	274	69	72.41	268
High molecular weight PAHs	NE	NE	18,000 [10][12]	NE	7910	90.9	1626	145.6	290.7	788

TABLE 6-1

Revised: March 1, 2011

SUMMARY OF DETECTED LABORATORY RESULTS - SURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	**Regional**	*Regional*	Selected		75SB01	75SB02	75SB03	75SB04	75SB04	75SB05
Sample ID	**Screening**	*Screening*	Ecological		75SB01-00	75SB02-00	75SB03-00	75SB04-00	75SB04-00D	75SB05-00
Sample Date	**Levels**	*Levels*	Soil	NAPR	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	**Residential**	*Industrial*	Screening	Basewide	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
	Soil	*Soil*	Values	Background [1]						
TPH (mg/kg)										
Diesel Range Organics	100 [5]	100 [5]	NE	NE	11 U	12 U	30	11 U	12	11 U
Gasoline Range Organics	100 [5]	100 [5]	NE	NE	0.54 UJ	0.6 UJ	0.54 UJ	0.53 UJ	0.53 UJ	0.54 UJ
Total TPH	100 [5]	100 [5]	NE	NE	11 U	12 U	30	11 U	12	11 U
Inorganics (mg/kg)										
Arsenic	0.390	1.60	18.0 [13]	2.65	**1.4** J	***2.8*** J	***2.4*** J	**1** J	0.52 UJ	***3.9*** J
Barium	1,500 [2]	19,000 [2]	330 [14]	199	16.1	11.2	23.8	86.5	101	52.8
Beryllium	16.0 [2]	200 [2]	21.0 [15]	0.590	0.54 U	0.58 U	0.52 U	0.11 J	0.12 J	0.078 J
Cadmium	7.0 [2]	80.0 [2]	0.770 [16]	1.02	0.95	0.085 J	0.37 J	0.27 J	0.22 J	0.2 J
Chromium	12,000 [2][6]	150,000 [2][6]	26.0 [17]	49.8	9.7	5.4	12.1	14	14.9	9.1
Cobalt	2.30 [2]	30.0 [2]	13.0 [18]	46.2	1.7	1.4	**2.5**	**11.4**	**13.2**	**3.7**
Copper	310 [2]	4,100 [2]	28.0 [19]	168	23	6.5	22.2	74.3	90.9	19.5
Lead	400 [7]	800 [7]	11.0 [20]	22.0	45.9	1.5	37	6.6 R	1.9 R	9.8
Mercury	0.560 [2]	3.40 [2]	0.10 [21]	0.109	0.018 J	0.039 U	0.036 U	0.009 J	0.035 U	0.007 J
Nickel	150 [2]	2,000 [2]	38.0 [22]	20.7	5.9	4.9	5.7	7.7	7.4	6.3
Selenium	39.0 [2]	510 [2]	0.520 [23]	1.48	0.33 J	0.45 J	0.31 J	0.37 J	0.27 J	0.46 J
Silver	39.0 [2]	510 [2]	4.20 [24]	NE	0.41 J	0.062 J	0.089 J	0.1 J	0.1 J	0.095 J
Thallium	NE	NE	1.0 [25]	--	0.14 J	0.038 J	0.042 J	0.099 J	0.1 J	0.059 J
Vanadium	0.550 [2]	7.20 [2]	7.80 [26]	259	***11.9*** J	**6.7** J	***20.1*** J	***81.2*** J	***85.1*** J	***25.6*** J
Zinc	2,300 [2]	31,000 [2]	46.0 [27]	115	84.3	6.9	22.5	61.6	61.4	30.6

TABLE 6-1

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SUMMARY OF DETECTED LABORATORY RESULTS - SURFACE SOIL
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Notes/Qualifiers:

U - Undetected at the Method Detection Limit
UJ - Reported quantitation limit is qualified as estimated
J - Estimated: The analyte was positively identified; the quantitation is an estimation
JN - Estimated: The analyte was tentatively identified; the quantitation is an estimation
R - Rejected data; data is not usable

ft bgs - feet below ground surface
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
NE - Not Established
NAPR - Naval Activity Puerto Rico
PAH - Polynuclear Aromatic Hydrocarbon
TPH - Total Petroleum Hydrocarbons

(1) NAPR basewide background surface soil screening value (upper limit of the means concentration [mean plus two standard deviations]) (Baker, 2010)
(2) Noncarcinogenic Regional Screening Levels based on a target hazard quotient of 0.1 for conservative screening purposes.
(3) Value for acenaphthene used as a surrogate.
(4) Value for pyrene used as a surrogate.
(5) Puerto Rico specific value
(6) Value for chromium III used as a surrogate.
(7) USEPA Residential Soil Action Level
(8) The screening value shown is an average of the target and intervention soil standards for soil remediation. The value is based on a default organic carbon content of 0.02 (2 percent), which represents a minimum value (adjustment range is 2 to 30 percent).
(9) The value represents a total concentration for all phthalates [MHSPE 2000]
(10) Ecological soil screening level for soil invertebrates [USEPA 2007a]
(11) Low molecular weight PAHs are defined by the USEPA (2007a) as PAH compounds composed of fewer than four rings. The low molecular weight PAH compounds include: 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, naphthalene, and phenanthrene.
(12) High molecular weight PAHs are defined by the USEPA (2007a) as PAH compounds composed of four or more rings. The high molecular weight PAH compounds include: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and pyrene.
(13) Ecological soil screening level for plants [USEPA 2005a]
(14) Ecological soil screening level for soil invertebrates [USEPA 2005b]
(15) Ecological soil screening level for mammalian herbivores [USEPA 2005c]
(16) Ecological soil screening level for avian ground insectivores [USEPA 2005d]
(17) Ecological soil screening level for avian ground insectivores [USEPA 2008]
(18) Ecological soil screening level for plants [USEPA 2005e]
(19) Ecological soil screening level for avian ground insectivores [USEPA 2007b]
(20) Ecological soil screening level for avian ground insectivores [USEPA 2005f]
(21) Toxicological threshold for earthworms [Efroymson et al. 1997a]
(22) Ecological soil screening level for plants [USEPA 2007c]
(23) Ecological soil screening level for plants [USEPA 2007d]
(24) Ecological soil screening level for avian ground insectivores [USEPA 2006]
(25) Toxicological threshold for plants [Efroymson et al. 1997b]
(26) Ecological soil screening level for avian ground insectivores [USEPA 2005g]
(27) Ecological soil screening level for avian ground insectivores [USEPA 2007e]

SUMMARY OF DETECTED LABORATORY RESULTS - SURFACE SOIL
SWMU 75 – BUILDING 803
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USEPA. 2007c. Ecological Soil Screening Levels for Nickel (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-76.

USEPA. 2007d. Ecological Soil Screening Levels for Selenium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-72.

USEPA. 2007e. Ecological Soil Screening Levels for Zinc (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-72.

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USEPA. 2005b. Ecological Soil Screening Levels for Barium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-63.

USEPA. 2005c. Ecological Soil Screening Levels for Beryllium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-63.

USEPA. 2005d. Ecological Soil Screening Levels for Cadmium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-62.

USEPA. 2005e. Ecological Soil Screening Levels for Cobalt (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-67

USEPA. 2005f. Ecological Soil Screening Levels for Lead (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-70.

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TABLE 6-2

Revised: March 1, 2011

SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	**Regional**	*Regional*	Selected		75SB01	75SB01	75SB01	75SB02	75SB02
Sample ID	**Screening**	*Screening*	Ecological		75SB01-01	75SB01-01D	75SB01-04	75SB02-01	75SB02-04
Sample Date	**Levels**	*Levels*	Soil	NAPR	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	**Residential**	*Industrial*	Screening	Basewide	1.0-3.0	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0
	Soil	*Soil*	Values	Background[1]					
Volatiles (µg/kg)									
None detected									
Semivolatiles (µg/kg)									
Acenaphthylene	340,000 [2][3]	3,300,000 [2][3]	NE	NE	21	190 U	11 U	5 J	0.99 J
Anthracene	1,700,000 [2]	17,000,000 [2]	NE	NE	40	25 J	11 U	16	11 U
Benzo(a)anthracene	150	2,100	NE	NE	36 J	**120** J	11 UJ	71 J	11 UJ
Benzo(a)pyrene	15.0	210	NE	NE	**72**	**200** J	11 U	**47**	1.1 J
Benzo(b)fluoranthene	150	2,100	NE	NE	57 J	**260** J	11 UJ	37 J	1.3 J
Benzo(g,h,i)perylene	170,000 [2][4]	1,700,000 [2][4]	NE	NE	73 J	110 J	11 U	32 J	1.4 J
Benzo(k)fluoranthene	1,500	21,000	NE	NE	60 J	260 J	11 UJ	33 J	1.6 J
Bis(2-ethylhexyl)phthalate	35,000	120,000	6,010 [8][9]	NE	190 U	190 U	75 J	190 U	220 U
Butyl Benzyl Phthalate	260,000	910,000	6,010 [8][9]	NE	190 U	190 U	220 U	110 J	220 U
Chrysene	15,000	210,000	NE	NE	37	170 J	11 U	50	0.92 J
Dibenz(a,h)anthracene	15.0	210	NE	NE	**17** J	**30** J	11 U	9.5 J	11 UJ
Fluoranthene	230,000 [2]	2,200,000 [2]	NE	NE	24	62 J	11 U	110	11 U
Indeno(1,2,3-cd)pyrene	150	2,100	NE	NE	87 J	120 J	11 UJ	46 J	1.9 J
Phenanthrene	170,000 [2][4]	1,700,000 [2][4]	NE	NE	9.1 U	190 U	11 U	41	11 U
Pyrene	170,000 [2]	1,700,000 [2]	NE	NE	32	110 J	11 U	87	11 U
PAH totals (µg/kg)									
Low molecular weight PAHs	NE	NE	29,000 [10][11]	NE	130.5	1227	88	208.4	77.99
High molecular weight PAHs	NE	NE	18,000 [10][12]	NE	471	1380	99	412.5	41.22
TPH (mg/kg)									
Diesel Range Organics	100 [5]	100 [5]	NE	NE	25	11 U	13 U	11 U	13 U
Gasoline Range Organics	100 [5]	100 [5]	NE	NE	0.55 UJ	0.56 UJ	0.64 UJ	0.55 UJ	0.63 UJ
Total TPH	100 [5]	100 [5]	NE	NE	25	11 U	13 U	11 U	13 U

TABLE 6-2

SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	**Regional**	*Regional*	Selected		75SB01	75SB01	75SB01	75SB02	75SB02
Sample ID	**Screening**	*Screening*	Ecological		75SB01-01	75SB01-01D	75SB01-04	75SB02-01	75SB02-04
Sample Date	**Levels**	*Levels*	Soil	NAPR	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	**Residential**	*Industrial*	Screening	Basewide	1.0-3.0	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0
	Soil	*Soil*	Values	Background[1]					
Inorganics (mg/kg)									
Antimony	3.10 [2]	41.0 [2]	10.0 [13]	7.44	1 UJ	1.1 UJ	1.2 UJ	1.1 UJ	1.2 UJ
Arsenic	0.390	1.60	18.0 [14]	6.66	***2.8*** J	***3*** J	***2.6*** J	***3.4*** J	***2.1*** J
Barium	1,500 [2]	19,000 [2]	330 [15]	207	16 J	16.3	6.8	15.5	6.4
Beryllium	16.0 [2]	200 [2]	21.0 [16]	0.933	0.046 J	0.55 U	0.59 U	0.54 U	0.61 U
Cadmium	7.0 [2]	80.0 [2]	0.770 [17]	0.574	0.95 J	0.77	0.59 U	0.74	0.61 U
Chromium	12,000 [2][6]	150,000 [2][6]	26.0 [18]	47.9	14.8	13.5	2.5	10	2.3
Cobalt	2.30 [2]	30.0 [2]	13.0 [19]	63.1	**2.7**	**2.7**	0.55 J	**2.6**	0.53 J
Copper	310 [2]	4,100 [2]	28.0 [20]	120	58.4	41.4	2.1	15.1	1.7
Lead	400 [7]	800 [7]	11.0 [21]	6.16	76.6	68.9	0.58 J	22.3	0.28 J
Mercury	0.560 [2]	3.40 [2]	0.10 [22]	0.0672	0.021 J	0.022 J	0.042 U	0.012 J	0.042 U
Nickel	150 [2]	2,000 [2]	38.0 [23]	26.5	7.5	6.2	4.2	5.9	4.1
Selenium	39.0 [2]	510 [2]	0.520 [24]	1.19	0.38 J	0.39 J	0.33 J	0.43 J	0.28 J
Silver	39.0 [2]	510 [2]	4.20 [24]	--	1.9 J	0.9	0.059 J	0.078 J	0.61 U
Thallium	NE	NE	1.0 [25]	NE	0.079 J	0.065 J	0.044 J	0.074 J	0.032 J
Tin	4,700 [2]	61,000 [2]	50.0 [26]	3.47	5.2 U	5.5 U	5.9 U	5.4 U	6.1 U
Vanadium	0.550 [2]	7.20 [2]	7.80 [27]	256	***17*** J	***18.5*** J	**2.8** J	***17.1*** J	**2.8** J
Zinc	2,300 [2]	31,000 [2]	46.0 [28]	92.2	100	80.5	2 J	48.1	1.7 J

TABLE 6-2

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SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 75 – BUILDING 803
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NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	**Regional**	*Regional*	Selected		75SB03	75SB03	75SB04	75SB04	75SB05
Sample ID	**Screening**	*Screening*	Ecological		75SB03-01	75SB03-04	75SB04-01	75SB04-04	75SB05-01
Sample Date	**Levels**	*Levels*	Soil	NAPR	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	**Residential**	*Industrial*	Screening	Basewide	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0	1.0-3.0
	Soil	*Soil*	Values	Background[1]					
Volatiles (µg/kg)									
None detected									
Semivolatiles (µg/kg)									
Acenaphthylene	340,000 [2][3]	3,300,000 [2][3]	NE	NE	10 U	1.6 J	5.1 J	13	14
Anthracene	1,700,000 [2]	17,000,000 [2]	NE	NE	10 U	9.9 U	9.3 U	14	18
Benzo(a)anthracene	150	2,100	NE	NE	10 UJ	9.9 UJ	9.3 UJ	20 J	68 J
Benzo(a)pyrene	15.0	210	NE	NE	10 U	4.9 J	13	**45**	**83**
Benzo(b)fluoranthene	150	2,100	NE	NE	10 UJ	5.5 J	14 J	24 J	41 J
Benzo(g,h,i)perylene	170,000 [2][4]	1,700,000 [2][4]	NE	NE	10 U	6.1 J	19 J	31 J	49 J
Benzo(k)fluoranthene	1,500	21,000	NE	NE	10 UJ	5.3 J	7.8 J	37 J	71 J
Bis(2-ethylhexyl)phthalate	35,000	120,000	6,010 [8][9]	NE	210 U	200 U	42 J	200 U	77 J
Butyl Benzyl Phthalate	260,000	910,000	6,010 [8][9]	NE	210 U	200 U	190 U	200 U	190 U
Chrysene	15,000	210,000	NE	NE	10 U	3.9 J	5.5 J	18	54
Dibenz(a,h)anthracene	15.0	210	NE	NE	10 U	0.96 J	4 J	10 U	**16** J
Fluoranthene	230,000 [2]	2,200,000 [2]	NE	NE	10 U	3.4 J	3.9 J	5.2 J	58
Indeno(1,2,3-cd)pyrene	150	2,100	NE	NE	10 UJ	8.3 J	23 J	45 J	70 J
Phenanthrene	170,000 [2][4]	1,700,000 [2][4]	NE	NE	10 U	9.9 U	9.3 U	10 U	9.1 U
Pyrene	170,000 [2]	1,700,000 [2]	NE	NE	10 U	9.9 U	9.3 U	10 U	67
PAH totals (µg/kg)									
Low molecular weight PAHs	NE	NE	29,000 [10][11]	NE	80	64.4	64.8	82.2	135.5
High molecular weight PAHs	NE	NE	18,000 [10][12]	NE	90	54.76	104.9	240	519
TPH (mg/kg)									
Diesel Range Organics	100 [5]	100 [5]	NE	NE	12 U	12 U	11 U	12 U	11 U
Gasoline Range Organics	100 [5]	100 [5]	NE	NE	0.61 UJ	0.6 UJ	0.56 UJ	0.6 UJ	0.55 UJ
Total TPH	100 [5]	100 [5]	NE	NE	12 U	12 U	11 U	12 U	11 U

TABLE 6-2

Revised: March 1, 2011

SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	**Regional**	*Regional*	Selected		75SB03	75SB03	75SB04	75SB04	75SB05
Sample ID	**Screening**	*Screening*	Ecological		75SB03-01	75SB03-04	75SB04-01	75SB04-04	75SB05-01
Sample Date	**Levels**	*Levels*	Soil	NAPR	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	**Residential**	*Industrial*	Screening	Basewide	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0	1.0-3.0
	Soil	*Soil*	Values	Background[1]					
Inorganics (mg/kg)									
Antimony	3.10 [2]	41.0 [2]	10.0 [13]	7.44	1.2 UJ	1.2 UJ	0.52 J	1.2 UJ	1.1 UJ
Arsenic	0.390	1.60	18.0 [14]	6.66	***2.8*** J	***4.2*** J	***13.3*** J	***2.3*** J	***2*** J
Barium	1,500 [2]	19,000 [2]	330 [15]	207	8.8	8	13.1	8.7	22.8
Beryllium	16.0 [2]	200 [2]	21.0 [16]	0.933	0.59 U	0.59 U	0.56 U	0.58 U	0.55 U
Cadmium	7.0 [2]	80.0 [2]	0.770 [17]	0.574	0.069 J	0.052 J	0.12 J	0.055 J	0.046 J
Chromium	12,000 [2][6]	150,000 [2][6]	26.0 [18]	47.9	6.9	7.5	18.6	2.6	4.6
Cobalt	2.30 [2]	30.0 [2]	13.0 [19]	63.1	1.4	2.3	**3.4**	0.64	1.5
Copper	310 [2]	4,100 [2]	28.0 [20]	120	4.7	4.6	13.8	1.9	6.9
Lead	400 [7]	800 [7]	11.0 [21]	6.16	0.95	0.68	3.2	0.4 J	3.2
Mercury	0.560 [2]	3.40 [2]	0.10 [22]	0.0672	0.04 U	0.039 U	0.037 U	0.04 U	0.036 U
Nickel	150 [2]	2,000 [2]	38.0 [23]	26.5	5.3	5.5	8.2	4.8	3.7
Selenium	39.0 [2]	510 [2]	0.520 [24]	1.19	0.47 J	0.34 J	0.89 J	0.35 J	0.28 J
Silver	39.0 [2]	510 [2]	4.20 [24]	--	0.11 J	0.06 J	0.56 U	0.075 J	0.076 J
Thallium	NE	NE	1.0 [25]	NE	0.06 J	0.049 J	0.13 J	0.034 J	0.032 J
Tin	4,700 [2]	61,000 [2]	50.0 [26]	3.47	5.9 U	5.9 U	5.6 U	5.8 U	5.5 U
Vanadium	0.550 [2]	7.20 [2]	7.80 [27]	256	***11.1*** J	***27.6*** J	***43.7*** J	**3.5** J	***12.4*** J
Zinc	2,300 [2]	31,000 [2]	46.0 [28]	92.2	4	4.2	13.8	1.6 J	6.6

TABLE 6-2

Revised: March 1, 2011

SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Notes/Qualifiers:

U - Undetected at the Method Detection Limit
UJ - Reported quantitation limit is qualified as estimated
J - Estimated: The analyte was positively identified; the quantitation is an estimation
NA - Not Analyzed
NE - Not Established
ft bgs - feet below ground surface
mg/kg - milligrams per kilogram
NAPR - Naval Activity Puerto Rico
PAH - Polynuclear Aromatic Hydrocarbon
TPH - Total Petroleum Hydrocarbons

(1) NAPR basewide background subsurface soil screening value for fine sand/silt (upper limit of the means concentration [mean plus two standard deviations]) (Baker, 2010)
(2) Noncarcinogenic Regional Screening Levels based on a target hazard quotient of 0.1 for conservative screening purposes.
(3) Value for acenaphthene used as a surrogate.
(4) Value for pyrene used as a surrogate.
(5) Puerto Rico specific value
(6) Value for chromium III used as a surrogate.
(7) USEPA Residential Soil Action Level
(8) The screening value shown is an average of the target and intervention soil standards for soil remediation. The value is based on a default organic carbon content of 0.02 (2 percent), which represents a minimum value (adjustment range is 2 to 30 percent).
(9) The value represents a total concentration for all phthalates [MHSPE 2000]
(10) Ecological soil screening level for soil invertebrates [USEPA 2007a]
(11) Low molecular weight PAHs are defined by the USEPA (2007a) as PAH compounds composed of fewer than four rings. The low molecular weight PAH compounds analyzed for in SWMU 56 soil were 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, naphthalene, and phenanthrene.
(12) High molecular weight PAHs are defined by the USEPA (2007a) as PAH compounds composed of four or more rings. The high molecular weight PAH compounds analyzed for in SWMU 56 soil were benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and pyrene.
(13) Ecological soil screening level for mammalian herbivores [USEPA 2005a]
(14) Ecological soil screening level for plants [USEPA 2005b]
(15) Ecological soil screening level for soil invertebrates [USEPA 2005c]
(16) Ecological soil screening level for mammalian herbivores [USEPA 2005d]
(17) Ecological soil screening level for avian ground insectivores [USEPA 2005e]
(18) Ecological soil screening level for avian ground insectivores [USEPA 2008]
(19) Ecological soil screening level for plants [USEPA 2005f]
(20) Ecological soil screening level for avian ground insectivores [USEPA 2007b]
(21) Ecological soil screening level for avian ground insectivores [USEPA 2005g]
(22) Toxicological threshold for earthworms [Efroymson et al. 1997a]
(23) Ecological soil screening level for plants [USEPA 2007c]
(24) Ecological soil screening level for plants [USEPA 2007d]
(25) Ecological soil screening level for avian ground insectivores [USEPA 2006]
(26) Toxicological threshold for plants [Efroymson et al. 1997b]
(27) Ecological soil screening level for avian ground insectivores [USEPA 2005h]
(28) Ecological soil screening level for avian ground insectivores [USEPA 2007e]

SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Table References:

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Efroymson, R.A., M.E. Will, G.W. Suter II, and A.C. Wooten. 1997b. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revisions. Oak Ridge National Laboratory, Oak Ridge, TN. ES/ER/TM-85/R3

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USEPA. 2007b. Ecological Soil Screening Levels for Copper (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-68.

USEPA. 2007c. Ecological Soil Screening Levels for Nickel (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-76.

USEPA. 2007d. Ecological Soil Screening Levels for Selenium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-72.

USEPA. 2007e. Ecological Soil Screening Levels for Zinc (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-72.

USEPA. 2006. Ecological Soil Screening Levels for Silver (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWEER Directive 9285.7-77.

USEPA. 2005a. Ecological Soil Screening Levels for Antimony (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-61.

USEPA. 2005b. Ecological Soil Screening Levels for Arsenic (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C.

USEPA. 2005c. Ecological Soil Screening Levels for Barium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-63.

USEPA. 2005d. Ecological Soil Screening Levels for Beryllium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-63.

USEPA. 2005e. Ecological Soil Screening Levels for Cadmium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-62.

USEPA. 2005f. Ecological Soil Screening Levels for Cobalt (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-67

USEPA. 2005g. Ecological Soil Screening Levels for Lead (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-70.

USEPA. 2005h. Ecological Soil Screening Levels for Vanadium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-75.

TABLE 6-3

SUMMARY OF DETECTED LABORATORY RESULTS - QUALITY ASSURANCE / QUALITY CONTROL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID	75ER01	75FB01	75TB01
Sample Date	3/29/2010	3/29/2010	3/29/2010
Volatiles (µg/L)			
2-Butanone (MEK)	1.7 J	1.6 J	2.5 R
Acetone	2.9 J	3 J	1.2 J
Benzene	0.044 J	0.053 J	0.5 U
Chloroform	0.26 J	0.31 J	0.5 U
Ethylbenzene	0.045 J	0.056 J	0.5 U
Methylene Chloride	5.1	5.7	0.062 J
Toluene	1.9	2.1	0.076 J
Xylene, m/p-	0.17 J	0.19 J	1 U
Xylene, o-	0.5 U	0.1 J	0.5 U
PAHs (µg/L)			
Naphthalene	0.084 J	0.085 J	NA
Low molecular weight PAHs	1.484	1.485	NA
High molecular weight PAHs	1.8	1.8	NA
TPH (mg/L)			
Gasoline Range Organics (GRO)	0.033 J	0.04 J	0.034 J
Total TPH	0.573 J	0.57 J	0.034 J

Notes:

U - Not detected
J - Analyte present - Reported value is estimated
R - Result is rejected and unusable
NA - Not Analyzed
PAH - Polyaromatic Hydrocarbons
TPH - Total Petroleum Hydrocarbons

FIGURES

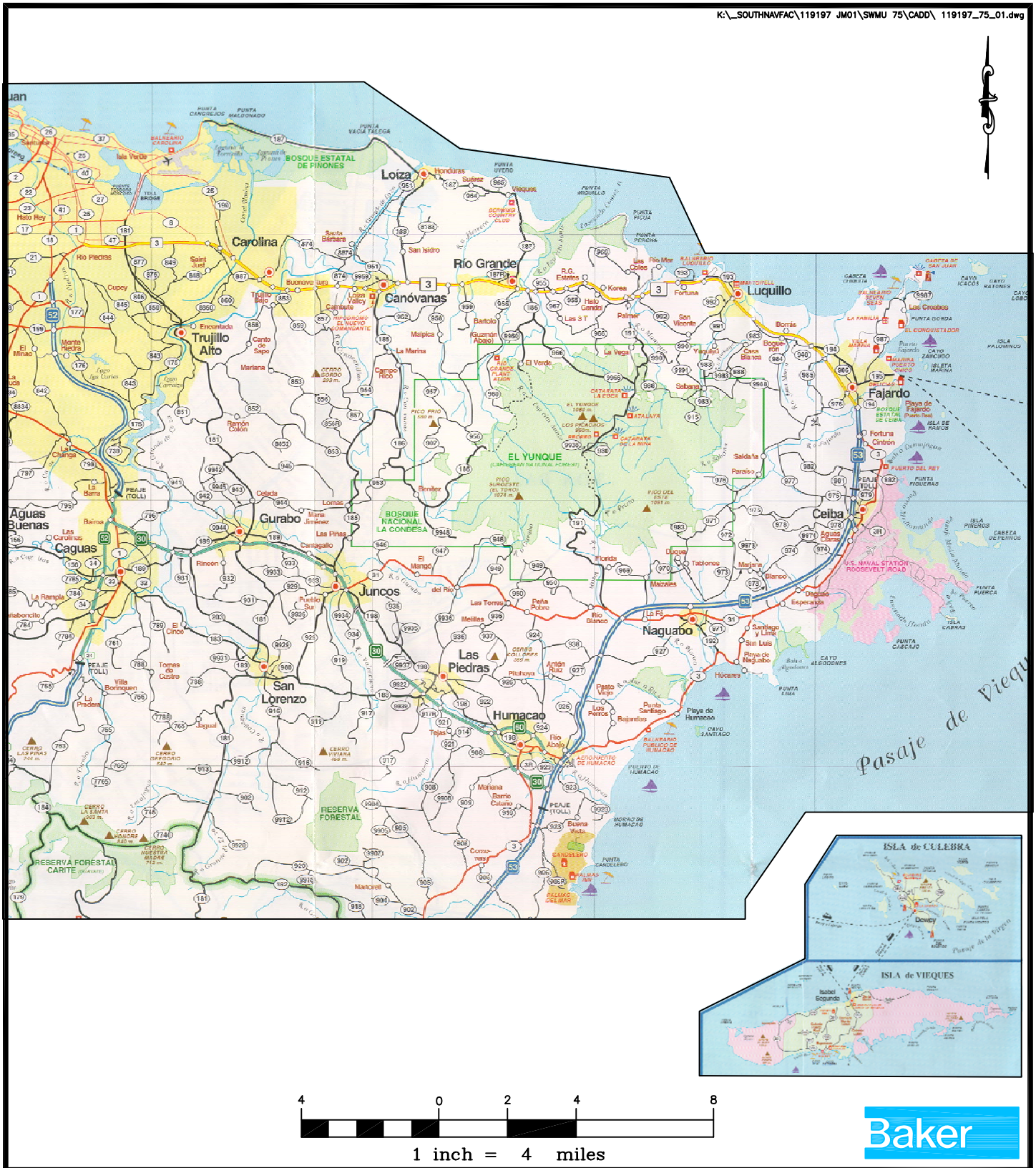


FIGURE 2-1
REGIONAL LOCATION MAP
SWMU 75-BUILDING 803
PHASE I RFI REPORT

SOURCE: METRODATA, INC., 1999.

NAVAL ACTIVITY PUERTO RICO

K:_SOUTHNAVFAC\119197 JM01\SWMU 75\CADD\ 119197_75_02.dwg

Baker

LEGEND

1 — SWMUs

75 — AREA TO WHICH THIS INVESTIGATION PERTAINS

AOC D — AOCs

SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

3000 0 1500 3000

1 inch = 3000 ft.

FIGURE 2-2
SWMU/AOC LOCATION MAP
SWMU 75-BUILDING 803
PHASE I RFI REPORT

NAVAL ACTIVITY PUERTO RICO

50 0 25 50

1 inch = 50 ft.

Baker

LEGEND

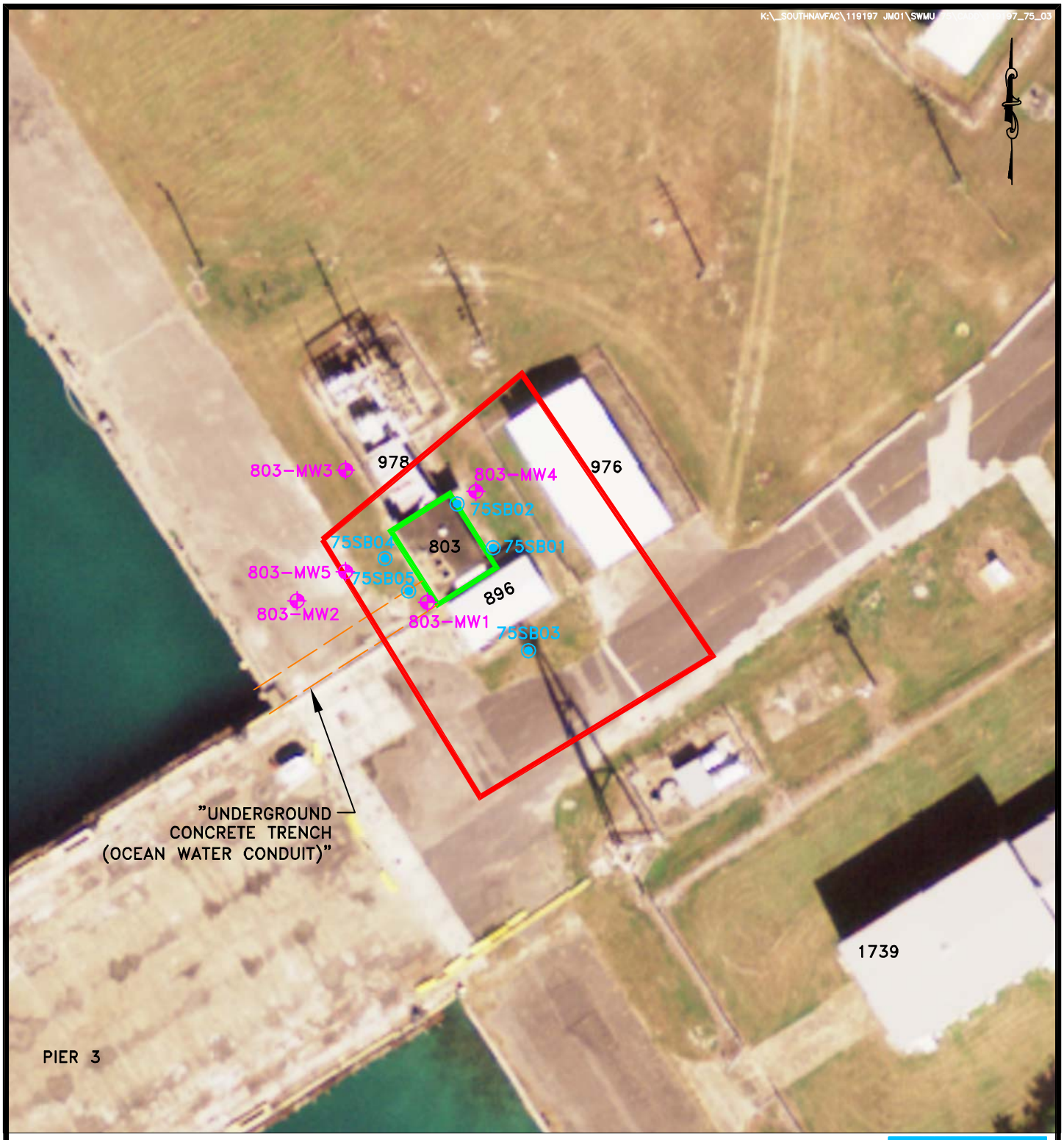
- SWMU BOUNDARY
- CONCRETE TRENCH
- BUILDING 803, FOUR INTERIOR WIPE SAMPLES WERE TAKEN (PHASE II ECP 2004)

803 – BUILDING NUMBER

SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

FIGURE 2-3
SWMU BOUNDARY MAP
SWMU 75-BUILDING 803
PHASE I RFI REPORT

NAVAL ACTIVITY PUERTO RICO



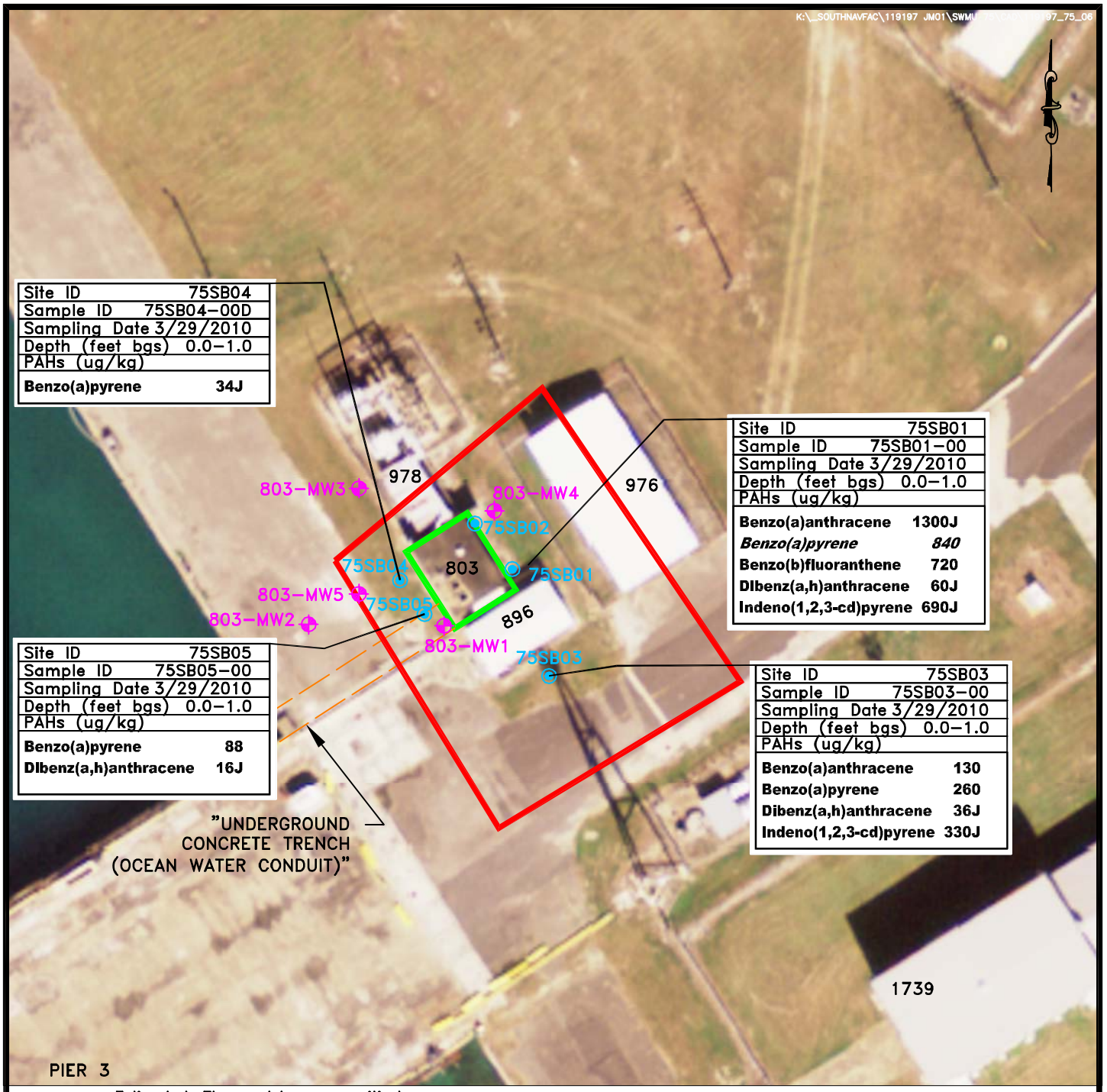
LEGEND

- ◇ – SWMU BOUNDARY
- — – CONCRETE TRENCH
- ▭ – BUILDING 803, FOUR INTERIOR WIPE SAMPLES WERE TAKEN (PHASE II ECP 2004)
- 803 – BUILDING NUMBER
- ⊕ – EXISTING MONITORING WELL LOCATION (SITE CHARATERIZATION SITE 803, 1994)
- ◉ – 2010 PHASE I RFI SOIL BORING LOCATION

SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

FIGURE 4-1
SAMPLE LOCATION MAP
SWMU 75-BUILDING 803
PHASE I RFI REPORT

NAVAL ACTIVITY PUERTO RICO



J: Estimated: The analyte was positively identified; the quantitation is an estimation

BOLD Exceeds Regional Screening Levels, Residential soil

ITALIC Exceeds Regional Screening Levels, Industrial soil

50 0 25 50

1 inch = 50 ft.

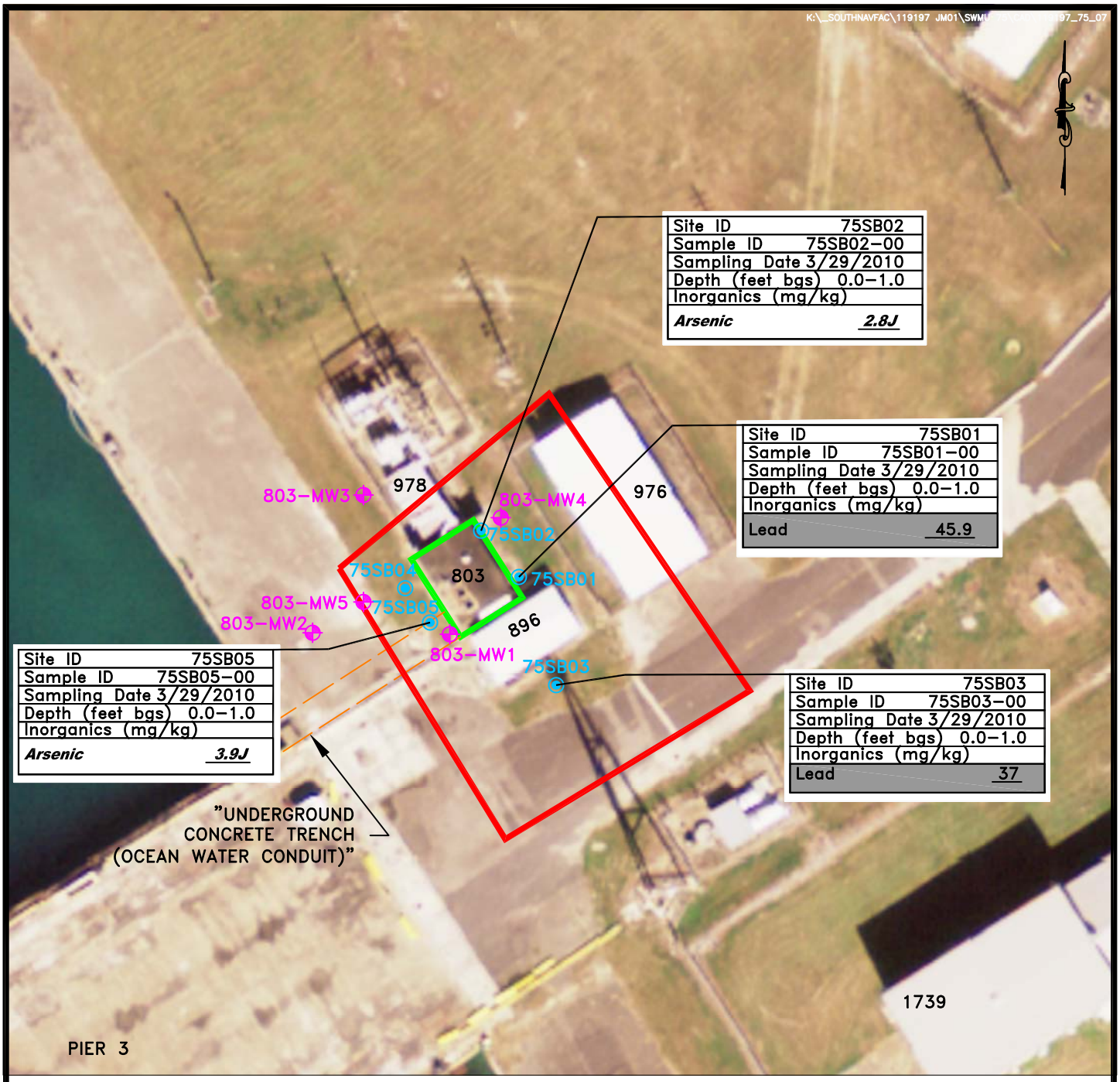
Baker

LEGEND

- ◇ – SWMU BOUNDARY
- — – CONCRETE TRENCH
- ▭ – BUILDING 803, FOUR INTERIOR WIPE SAMPLES WERE TAKEN (PHASE II ECP 2004)
- 803 – BUILDING NUMBER
- ⊕ – EXISTING MONITORING WELL LOCATION (SITE CHARACTERIZATION SITE 803, 1994)
- ◉ – 2010 PHASE I RFI SOIL BORING LOCATION

SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

FIGURE 6-1
DETECTED ORGANICS IN EXCESS OF HUMAN HEALTH SCREENING CRITERIA IN SURFACE SOIL
SWMU 75-BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO



J: Estimated: The analyte was positively identified; the quantitation is an estimation

Exceeds Ecological Soil Screening Values

BOLD Exceeds Regional Screening Levels, Residential soil

ITALIC Exceeds Regional Screening Levels, Industrial soil

UNDERLINE Exceeds Basewide Background

50 0 25 50

1 inch = 50 ft.

Baker

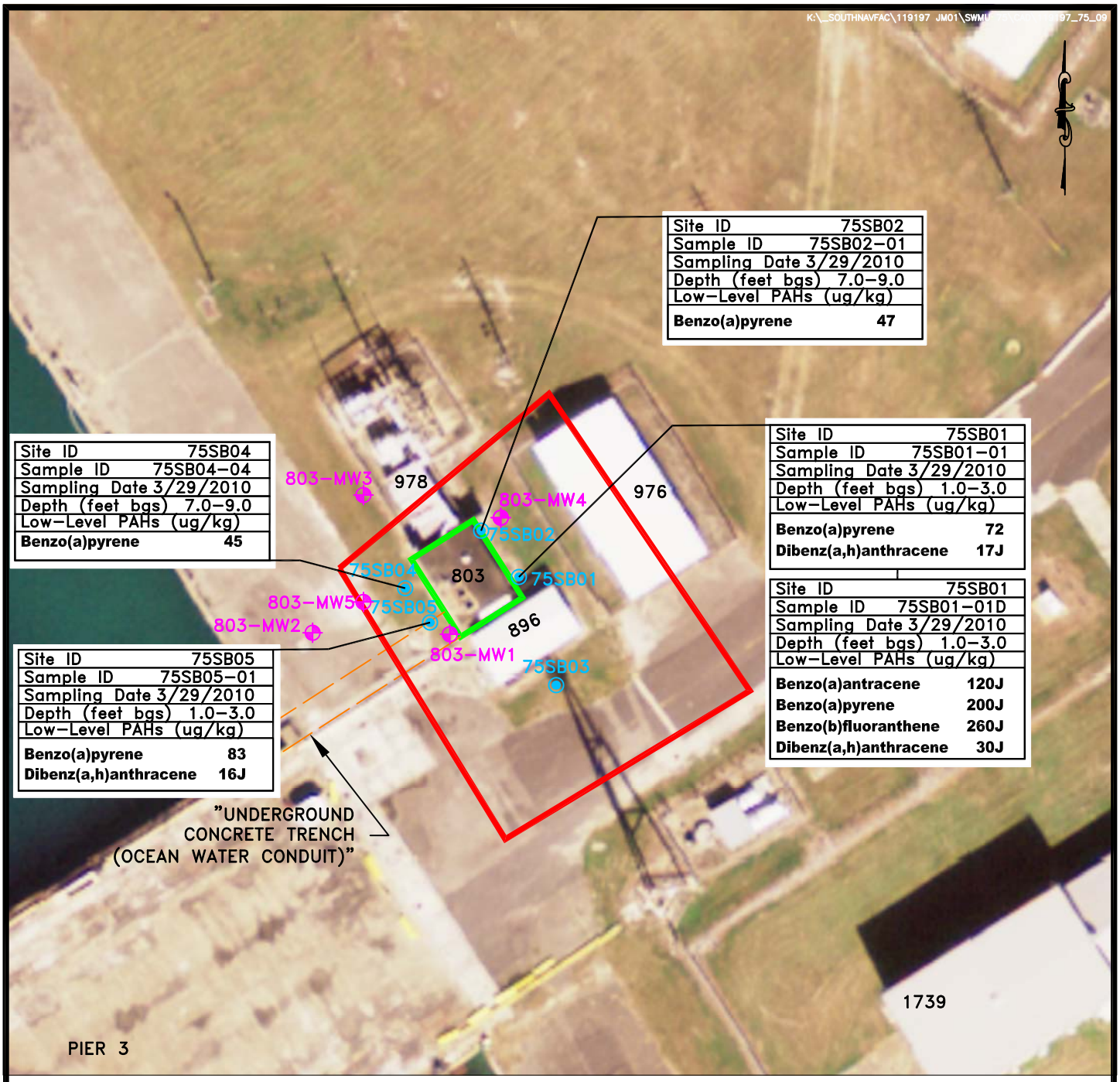
LEGEND

- ◇ – SWMU BOUNDARY
- — – CONCRETE TRENCH
- ▭ – BUILDING 803, FOUR INTERIOR WIPE SAMPLES WERE TAKEN (PHASE II ECP 2004)
- 803 – BUILDING NUMBER
- ⊕ – EXISTING MONITORING WELL LOCATION (SITE CHARACTERIZATION SITE 803, 1994)
- ◉ – 2010 PHASE I RFI SOIL BORING LOCATION

SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

FIGURE 6-2

DETECTED INORGANICS IN EXCESS OF HUMAN HEALTH AND/OR ECOLOGICAL AND BACKGROUND SCREENING CRITERIA IN SURFACE SOIL
SWMU 75-BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO



J: Estimated: The analyte was positively identified; the quantitation is an estimation

BOLD Exceeds Regional Screening Levels, Residential soil

50 0 25 50

1 inch = 50 ft.

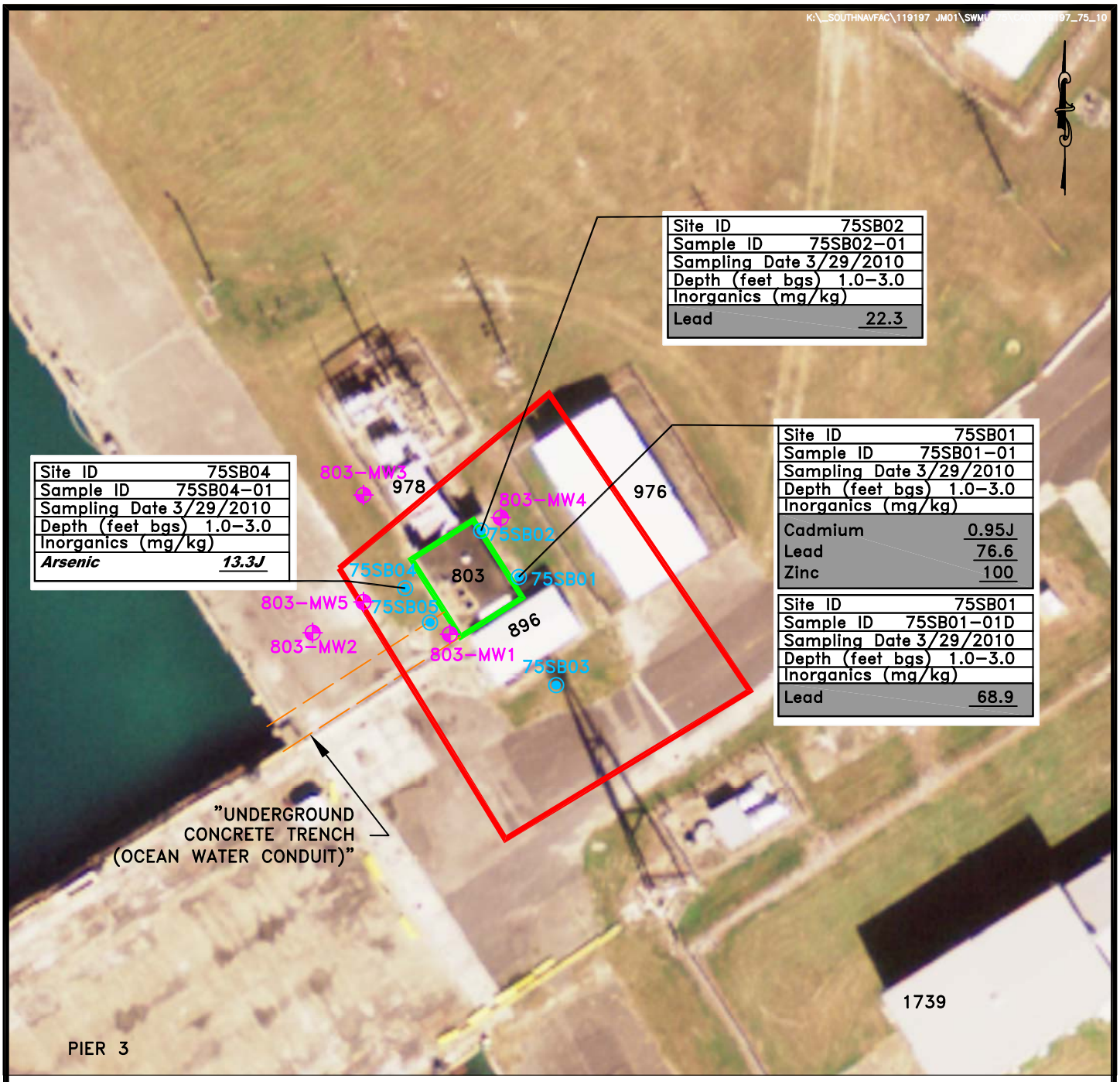
Baker

LEGEND

- ◇ – SWMU BOUNDARY
- — – CONCRETE TRENCH
- ▭ – BUILDING 803, FOUR INTERIOR WIPE SAMPLES WERE TAKEN (PHASE II ECP 2004)
- 803 – BUILDING NUMBER
- ⊕ – EXISTING MONITORING WELL LOCATION (SITE CHARACTERIZATION SITE 803, 1994)
- ◉ – 2010 PHASE I RFI SOIL BORING LOCATION

SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

FIGURE 6-3
DETECTED ORGANICS IN EXCESS OF HUMAN HEALTH SCREENING CRITERIA IN SUBSURFACE SOIL SWMU 75-BUILDING 803 PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO



J: Estimated: The analyte was positively identified; the quantitation is an estimation

Exceeds Ecological Soil Screening Values

BOLD Exceeds Regional Screening Levels, Residential soil

ITALIC Exceeds Regional Screening Levels, Industrial soil

UNDERLINE Exceeds Basewide Background

50 0 25 50

1 inch = 50 ft.

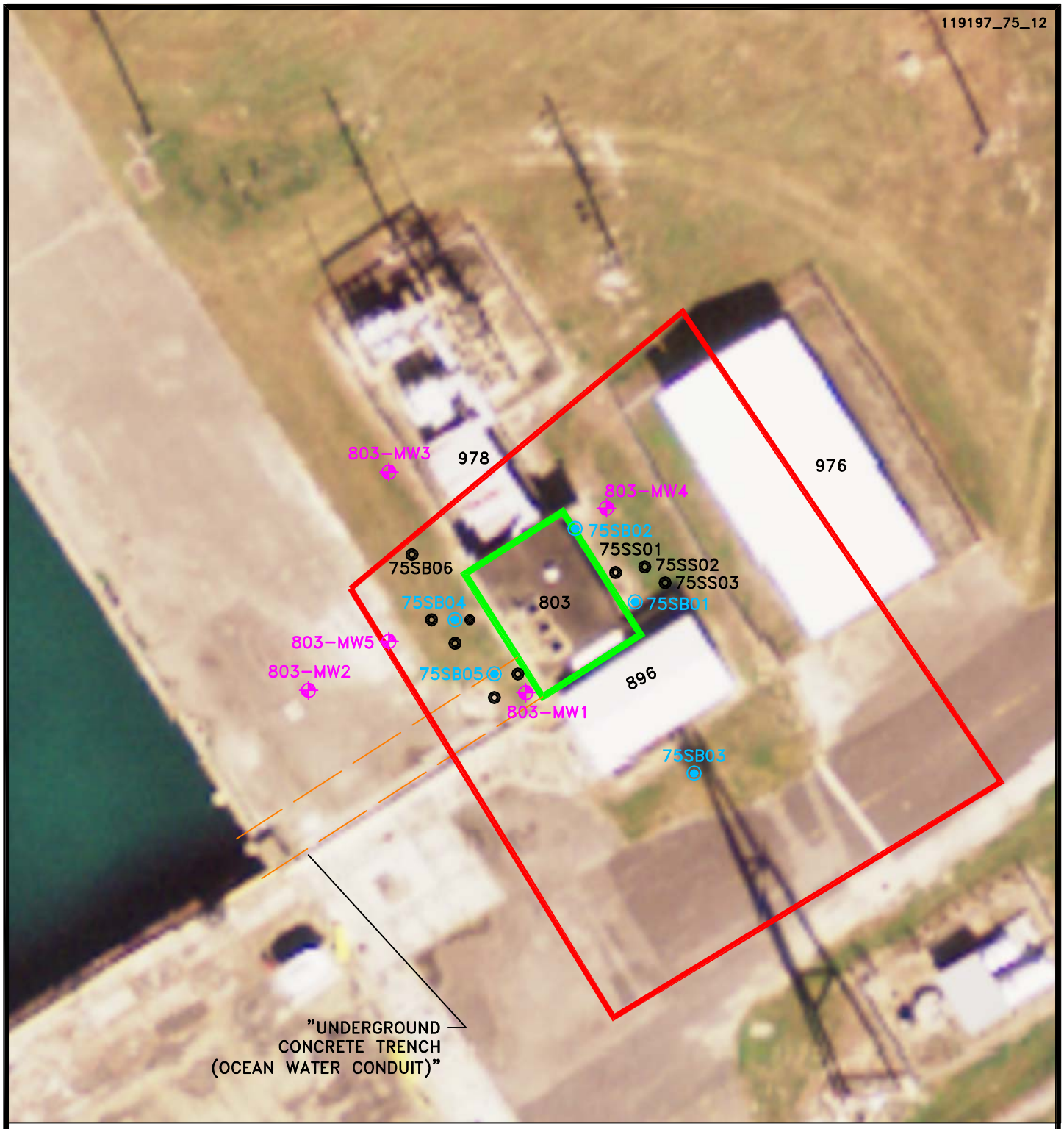
Baker

LEGEND

- ◇ – SWMU BOUNDARY
- — – CONCRETE TRENCH
- ▭ – BUILDING 803, FOUR INTERIOR WIPE SAMPLES WERE TAKEN (PHASE II ECP 2004)
- 803 – BUILDING NUMBER
- ⊕ – EXISTING MONITORING WELL LOCATION (SITE CHARACTERIZATION SITE 803, 1994)
- ◉ – 2010 PHASE I RFI SOIL BORING LOCATION

SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

FIGURE 6-4
DETECTED INORGANICS IN EXCESS OF HUMAN HEALTH AND/OR ECOLOGICAL AND BACKGROUND SCREENING CRITERIA IN SUBSURFACE SOIL
SWMU 75-BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO



LEGEND

- ◇ – SWMU BOUNDARY
- — – CONCRETE TRENCH
- ▭ – BUILDING 803, FOUR INTERIOR WIPE SAMPLES WERE TAKEN (PHASE II ECP 2004)
- 803 – BUILDING NUMBER
- ⊕ – EXISTING MONITORING WELL LOCATION (SITE CHARACTERIZATION REPORT, SITE 803, 1994)
- ◉ – 2010 PHASE I RFI SOIL BORING LOCATION
- ● – PROPOSED SURFACE SOIL LOCATION (FULL RFI)
- ◉ – PROPOSED SOIL BORING LOCATION (FULL RFI)

SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

FIGURE 7-1
PROPOSED SAMPLE LOCATION MAP
FULL RFI
SWMU 75-BUILDING 803
PHASE I RFI REPORT

NAVAL ACTIVITY PUERTO RICO

APPENDIX A
SUMMARY OF ANALYTICAL RESULTS FROM PHASE II ECP

TABLE A-1

SUMMARY OF ORGANIC DETECTIONS IN WIPE SAMPLES
SWMU 75 - BUILDING 803
PHASE II ECP STUDY
NAVAL ACTIVITY PUERTO RICO

Site ID	21E-WS01		21E-WS02		21E-WS03		21E-WS03		21E-WS04		Number of	Range of	Location of
Sample ID	21E-WS01		21E-WS02		21E-WS03		21E-WS03D		21E-WS04		Positive	Positive	Maximum
Sample Date	05/09/04		05/09/04		05/09/04		05/09/04		05/09/04		Detections	Detections	Detection
Semivolatile Organic Compounds (ug/100 cm^2)													
bis(2-Ethylhexyl)phthalate	3.8	J	10	U	10	U	10	U	10	U	1/5	3.8J	21E-WS01
Di-n-butylphthalate	10	U	10	U	1.7	J	10	U	10	U	1/5	1.7J	21E-WS03
PCBs (ug/100 cm^2)													
Not Detected													

Notes:

J - The reported result is an estimated concentration that is less than the PQL, but greater than or equal to the MDL.
U - The compound was analyzed for, but was not detected at or above the MDL/PQL.
ug/100 cm^2 - micrograms per 100 centimeters squared.

TABLE A-2

SUMMARY OF INORGANIC DETECTIONS IN WIPE SAMPLES
SWMU 75 - BUILDING 803
PHASE II ECP STUDY
NAVAL ACTIVITY PUERTO RICO

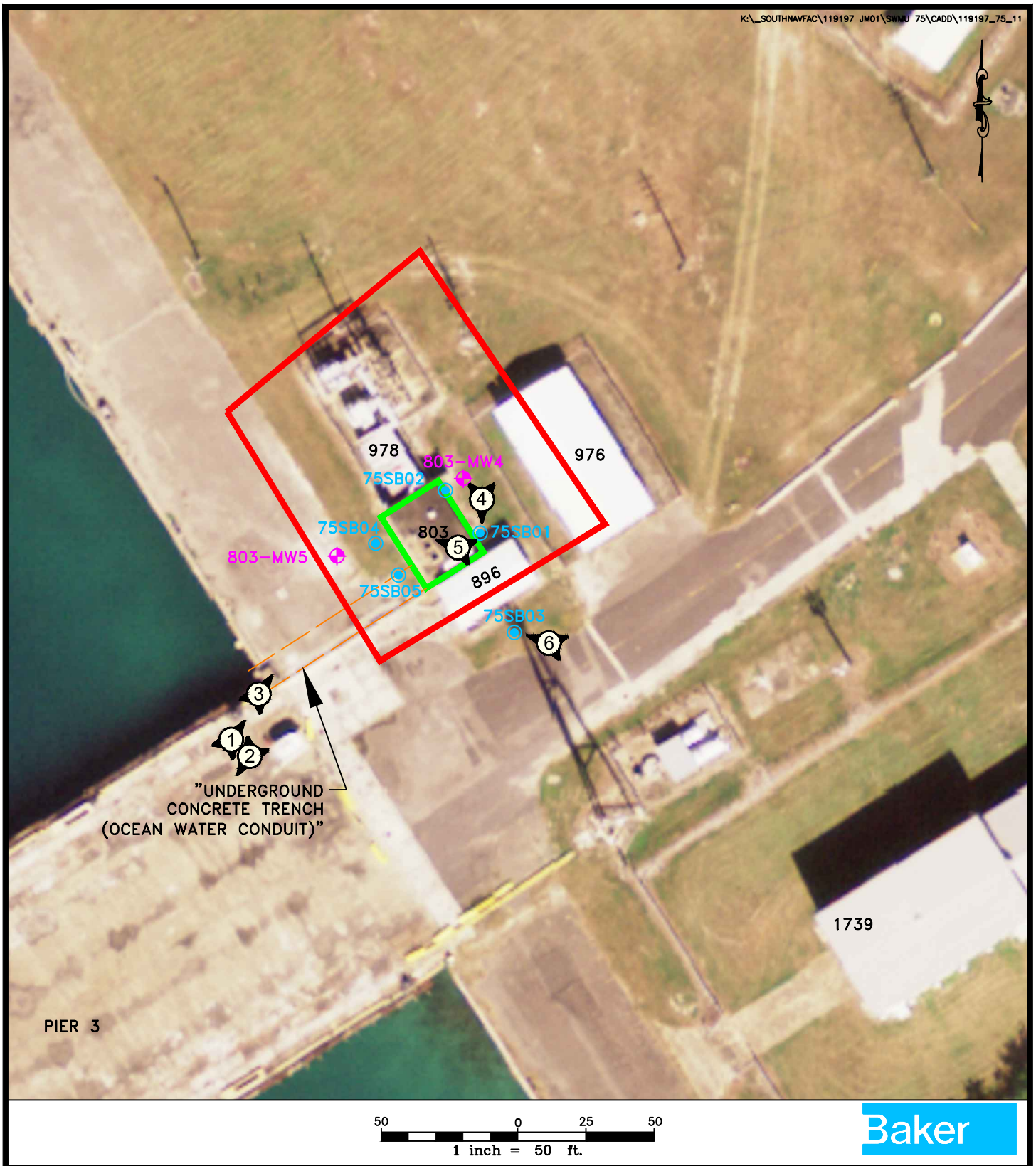
Site ID Sample ID Sample Date	21E-WS01 21E-WS01 05/09/04	21E-WS02 21E-WS02 05/09/04	21E-WS03 21E-WS03 05/09/04	21E-WS03 21E-WS03D 05/09/04	21E-WS04 21E-WS04 05/09/04	Number of Positive Detections	Range of Positive Detections	Location of Maximum Detection
Appendix IX Metals (mg/100 cm^2)								
Antimony	0.00059	0.00032	4.2E-05 B	0.000075 B	9.8E-05 B	5/5	0.000042B - 0.00059	21E-WS01
Arsenic	0.0035	0.0012	0.0005 U	0.0001 B	0.00021 B	4/5	0.0001B - 0.0035	21E-WS01
Barium	0.061	0.015	0.0007	0.0012	0.0017	5/5	0.0007 - 0.061	21E-WS01
Beryllium	0.00019	0.000092	6E-06 B	0.000007 B	0.00001 B	5/5	0.000006B - 0.00019	21E-WS01
Cadmium	0.021	0.0025	0.00068	0.00081	0.0006	5/5	0.0006 - 0.021	21E-WS01
Chromium	0.087	0.039	0.00087	0.0018	0.0013	5/5	0.00087 - 0.087	21E-WS01
Cobalt	0.0095	0.0025	9.6E-05 B	0.0002 B	0.00015 B	5/5	0.000096B - 0.0095	21E-WS01
Copper	0.64	0.046	0.012	0.0073	0.0041	5/5	0.0041 - 0.64	21E-WS01
Lead	0.39	0.062	0.0045	0.0062	0.0083	5/5	0.0045 - 0.39	21E-WS01
Mercury	3.3E-05	0.00002	0.00002 U	0.00002 U	0.00002 U	2/5	0.00002 - 0.000033	21E-WS01
Nickel	0.023	0.02	0.00053	0.00075	0.00067	5/5	0.00053 - 0.023	21E-WS01
Selenium	0.00012 B	0.000073 B	0.00025 U	0.00025 U	3.9E-05 B	3/5	0.000039B - 0.00012B	21E-WS01
Silver	0.00012 B	0.00015 B	6E-06 B	0.0005 U	1.6E-05 B	4/5	0.000006B - 0.00015B	21E-WS02
Thallium	4.5E-05 B	0.000021 B	0.0001 U	0.00007 B	0.0001 U	3/5	0.000021B - 0.00007B	21E-WS03D
Tin	0.0099	0.0037	0.0015 B	0.0019 B	0.0014 B	5/5	0.0014B - 0.0099	21E-WS01
Vanadium	0.025	0.0094	0.0004 B	0.00065	0.0021	5/5	0.0004B - 0.025	21E-WS01
Zinc	1.3	0.22	0.043	0.057	0.035	5/5	0.035 - 1.3	21E-WS01

Notes:

B - The reported result is an estimated concentration that is less than the PQL, but greater than or equal to the MDL.
U - The compound was analyzed for, but was not detected at or above the MDL/PQL.
mg/100 cm^2 - milligrams per 100 centimeters squared.

APPENDIX B
2010 FIELD ACTIVITIES

SITE PHOTOGRAPHS



LEGEND

- SWMU BOUNDARY
- CONCRETE TRENCH
- BUILDING 803, FOUR INTERIOR WIPE SAMPLES WERE TAKEN (PHASE II ECP 2004)
- EXISTING MONITORING WELL LOCATION (SITE CHARATERIZATION SITE 803, 1994)
- 2010 PHASE I RFI SOIL BORING LOCATION
- PHOTO LOCATION AND DIRECTION

803 – BUILDING NUMBER

SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

PHOTO LOCATION MAP
SWMU 75-BUILDING 803
PHASE I RFI REPORT

NAVAL ACTIVITY PUERTO RICO

Photo 1. In background - from left to right: Building 978 (and power station), Building 803 (SWMU 75), and Building 896 on the right – view looking northeast

Photo 2. Pier 3 and the Ensenada Honda – view looking southwest

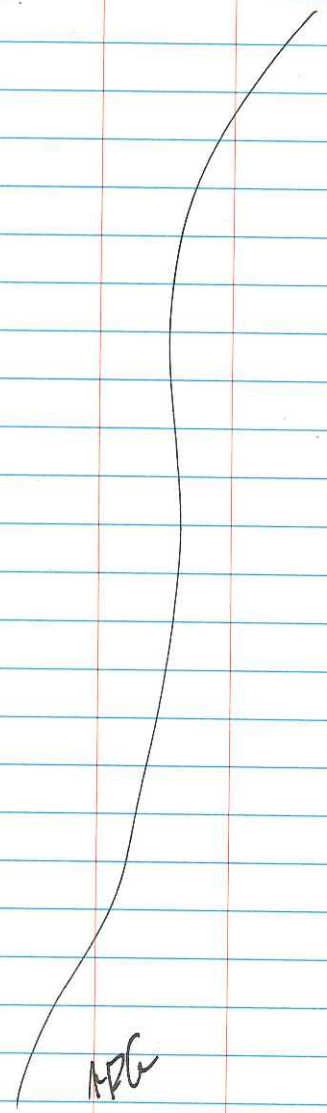
Photo 3. Opening to underground concrete trench ("Ocean Water Conduit")
View looking northeast

Photo 4. Boring advancement at 75SB02 - view looking south

Photo 5. Fire deluge and pump equipment inside Building 803

Photo 6. Soil boring advancement at 75SB03 - south side of Building 896
View looking west

FIELD LOG BOOK NOTES



MonDAY March 29, 2010

0645 - Arrive at NAPR - prep for Summit 75 Soil Boring advancement.

0825 - Depart Security and arrive at Summit 75.

0850 - Collect 75FB01

0900 - Collect 75ER01 - by Rinsing DI water through an un-used Macro Core Liner.

0905 - Drillers arrive on-site.

0930 - Assist with ~~Drilling~~ Soil Sampling (See R. Rosellus logbook for addt'l info.)

1220 - Depart Summit 75 to Security Bldg. Pack and Prep Samples for Fedex for Summit 67.

Weather Conditions:
Sunny + Warm 84° F.

1201 DEVELOP 67GW03 - TD 17.82' TOC
SWL 11.20 → 6.62
APPROX STICKUP 2.6' ∴ 4.1 GAL/VOL
BOTTOM SOFT & SOUPY SIMILAR TO 67GW08
SURGE/BAIL 10+ GAL OVER 40 MIN.

1446 SWL 14.45 & RISING GOOD
TD 18.15' HARD
- ATTEMPT SAMPLE @ 67GW01
VERY LOW YIELD - TOO LOW FOR "LOW FLOW" SAMPLING.
MANUAL SAMPLES @ OFFICE.

1615 DEPART NSPL.

SUN. (3/28/10) B.2

0815 ONSITE, PREP FOR GW SAMP, MANUALS
SAMPLES CALIBRATED YET (SEE GALLEY LOG/
CAL RECORDS)
0735 CALIBRATE PID to 100 ppm.

FLUSH MOUNT.
0900 @ 75 SWL @ WELL SOUTH OF BLDG (BETWEEN BLDG & PIER) - 8.20' TOC
TOC APPROX. 0.2'± bgs ∴ SWL 8.4' bgs.
- TIDE NEAR HIGH (MAYBE DOWN 0.5' FROM HIGH?) - 9±' FROM TOP OF PIER CONCRETE
COLLECT
0940 67GW02 - NO LOW FLOW
1045 67ER07
1320 COLLECT 67GW04
- SEE GALLEY & GW SAMPLE LOGS)
RETURN TO OFFICE, MANIFEST SAMPLES, ORG.
1415 DEPART NSPL

- @ LUNCH: SUBMITS KICKOFF, WP, CREATE LOGELS (COMPUCHEM DID NOT PROVIDE).

MON (3/29/10

0645 ONSITE, PREP FOR SUBMUTS SAMPLING, ORG OFFICE/TRUCK
0740 CALIBRATE PID to 103ppm.
0850 COLLECT 75FB01
0900 CONVERT 75ER01 FROM NEW DPT LINER. (SEE CONDY LOG).
— AWAITING ARRIVAL OF DRILLERS.
0902 DRILLERS ARRIVE. TRAVEL TO 75
0920 CONDUCT 75 KICKOFF & H&S MEETING
— UTILITIES CLEARED BY MORE KIMES.
0930 BEGIN

— 75SB03 — (PID BKG 0.0)

0-4 0-0.2 TOPSOIL
3.2 0.2-4.0 FILL - ~~FINE~~ SILT to MED SAND, ~~SH~~ (BROWN SAND), LITTLE SHELLS, GRAYISH/LT TAN, DRY to DAMP, NON PLASTIC, LOOSE (FILL?)
BKG
75SB03-00 @0935
75SB03-01 @0940

4-8 4.0-8.0 SAA, DAMP.
2.9
BKG
75SB03-04 @0950

75SB03 (CONT)

8-12 8.0-12.0 SAA. & MOIST,
3.2 WET/SATURATED @ 10' bgs.
BKG

— 75SB05 — (PID BKG 0.0)

0-4 0.0-0.1 TOPSOIL (LITTLE)
2.2 0.1-3.9 (SAME @ 75SB03 - BROWN SAND LITTLE SHELLS.) B
BKG
75SB05-00 @1000 3.9-4.0 CONCRETE W/ NOSE/REFUSAL (LIKELY THE WATER TROUGH?) TERMINATE BORING
75SB05-01 @1005 ^ CONSTRUCTION FEATURE

— 75SB04 — (PID BKG 0.0)

0-4 ~~0-1.8 FILL~~
2.6 0.0-0.2 TOPSOIL
BKG 0.2-1.3 FILL. SILT to GRAVEL, SOME CLAY, BROWN, LT GREY GRAVEL, DRY to DAMP, NON PLASTIC, LOOSE.
75SB04-00 +DUP @1015 1.3-4.0 FILL - BROKEN SAND & SHELLS AS SB03 & SB05.
75SB04-01 +MS/MSD @1025 } MS + MSD (DOUBLE VOL) FOR VOCS
MS/MSD (SMALL) FOR OTHERS

755B04 (CONT)

4-8 SAME AS ABOVE — BEACH SAND, DAMP
BKGD
2.8

755B04-04
@1040

8-12 SAA, WET SATURATED (VERY
1.2 LITTLE RECOVERY)
BKGD.

— 755B02 — (PID BKG 0.0)

0-4 — STBT
2.5
BKG

755B02-00
@1115

755B02-01
@1120.

→ 0.0 - 0.2 FILL SILT to GRAVEL, BR, LT GRAY GRAVEL, DRY, NON PLASTIC, LOOSE
0.2-4.0 BEACH SAND AS OTHERS

755B02 (CONT)

~~8-12~~

4-8 4.0-8.0. SAA BEACH SAND+, DAMP
2.6
BKG.

755B02-04
@1125

8-12 8.0-12.0 SAA BEACH SAND, WET/
2.4 SATURATED.
BKG

— 755B01 — (PID BKG 0.0)

0-4 0.0-0.4 (NO TOPSOIL) FILL —
1.9 SILT & FINE SAND, BR & BEACH SAND
BKG MIXED, DRY to DAMP, NON PLASTIC,
LOOSE.

755B01-00
@1140

755B01-01
+ DUP
@1145

75SB01 (CONT.)

4-8 FILL - BEACH SAND & SHELLS (SAME AS OTHERS), DAMP
2.9
BKG

75SB01-04
@ ~~1145~~ 1155 RHR

8-12 BEACH SAND, WET/SATURATED
2.1
BKG

1200 DRILLER GROUTING SBs,

— MANAGE SAMPLES
~~GW~~ SWL'S @ LANDFILL
PREP/ORG - (SEE GAILEY LOG)

1645 DEPART NAPR

WORK @ CONDO - 67 & 75 SB/MW
SUM TBLS.

RHR

TUES (3/30/10)

0640 ONSITE, PREP TO GW SAMPLE, PLAN TO MEET SURVEYORS: TRANSYSTEM, INC.
BOB MCNEAL 757 630 1675
GEORGE FRANKLIN 757 375 1310

0715 SURVEYORS ON SITE, KICKOFF MEETING, SITE VISITS OF SWMUs 75, 57, 67 & 61

~~10 1030~~ RHR

0900 PREP TO SAMPLE/PURGE (LOW FLOW) 67GW03 (SEE GW SAMPLING LOGS)

1005 COLLECT 67ER08 FROM SS SPOON (SEE GAILEY LOG FOR SURFACE SOIL SAMPLING DETAILS)

1030 COLLECT 67GW03 (SEE SAMPLING LOGS)

- COLLECT IDW SAMPLES (SEE GAILEY LOG)

- PREP/PACK/MANAGE/SHIP SWMUs 67 & 75 SAMPLES.

1445 DEPART NAPR
GW SAMPLE LOGS/DRILLING LOGS @ CONDO.

RHR
~~-1005 ER08 SS~~
~~-1030 GW03~~

108

WED (3/31/10)

0645 ONSITE, PREP/ORG/PACK EQUIP.

— @ 75 TRY TO REMOVE FLASHMNT.
MARK BOTTOM / TD 14.38' TOC
0830 75-N 8.21' TOC
0832 75-S 8.33' TOC
(AS SUN. 3/28) TD 15.1' TOC
* NEAR HIGH TIDE; BASED ON HIGH WATER MARKS ON PIER

1000 COMPLETE GPS / EVAL OF SWMN 55
CONSIDERATIONS — • CONCRETE
• FLUSH MOUNTS
• CLEARING (BUT NOT RIGHT WAY)
• UTILITIES.
(FIRE HYDRANTS FINAL ELINE)
WIPE/CHIP.
• S7GW02 CONFLICTS W/ MAPPING.

109

1020 @ SWMH 67 FOR SWLS.

				CASING IMAGE
1023	S7GW07	14.94', TOC		S
1024	06	14.88'		N
1025	05	11.92		SW
1027	02	10.68		SE
1028	01	9.21		NE
1029	04	13.00		E
1031	03	11.34		N
1032	03	5.28		S

1055 DRIVE @ SWMH 61 FOR SWLS
SEE PAGE 71 — SURVEYORS ONSITE.
— CLEAN ORG / SNIP EQUIP / INVENTORY VEHICLE.
1145 DEPART NOAR.

@ CMOD — SWMH 59 SCHEDULE / LOGISTICS / AIRFARE / LODGING / PLANNING

SOIL BORING LOGS

Baker
Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Naval Activity Puerto Rico SWMU 75
PROJ. NO.: 119197, 6.8 BORING NO.: 75SB01
COORDINATES: EAST: 939608.8033 NORTH: 798978.7114
ELEVATION: SURFACE: 110.0

Rig:	Geoprobe Track Rig 6610 DT				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Macro Sampler	Casing	Augers	Core Barrel				
Size (ID)	1-5/8"	--	--	--	3/29/2010	0.0 - 12.0	sunny, mid+ 80s	
Length	4'	--	--	--				
Type	Acetate	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks: PID background (BKG) is 0.0.

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BKG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Elevation (Ft. Datum)
1					75SB01-00		SILT and FINE SAND, some beach sand, brown; dry to damp; non plastic; loose (fill) 0.4	109.6
2		D-1	1.9 48%		75SB01-01 + duplicate	BKG	SILT to MEDIUM SAND (beach sand), little shells; whitish, light tan; dry to damp; non plastic; loose (fill)	
3								
4	4.0							
5							same as above and damp	
6		D-2	2.9 73%			BKG		
7								
8	8.0				75SB01-04			
9							same as above and wet/saturated	
10		D-3	2.1 53%			BKG		

DRILLING CO.: GeoEnviroTech, Inc. BAKER REP.: Robert Roselius
DRILLER: William Rodrigez BORING NO.: 75SB01 SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Naval Activity Puerto Rico SWMU 75

SO NO.: 119197, 6.8 BORING NO.: 75SB01

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Elevation (Ft. Datum)
11							Continued from Sheet 1 11.0	99.0
		D-3	2.1			BKG	grades to gray and olive, med plasticity, stiff	
12	12.0		53%					98.0
13							End of Boring at 12.0'	
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: GeoEnviroTech, Inc. BAKER REP.: Robert Roselius

DRILLER: William Rodrigez BORING NO.: 75SB01 SHEET 2 OF 2

Baker
Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Naval Activity Puerto Rico SWMU 75
PROJ. NO.: 119197, 6.8 BORING NO.: 75SB02
COORDINATES: EAST: 939596.0610 NORTH: 798994.2823
ELEVATION: SURFACE: 110.2

Rig:	Geoprobe Track Rig 6610 DT				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Macro Sampler	Casing	Augers	Core Barrel				
Size (ID)	1-5/8"	--	--	--	3/29/2010	0.0 - 12.0	sunny, mid+ 80s	
Length	4'	--	--	--				
Type	Acetate	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks: PID background (BKG) is 0.0.

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BKG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Elevation (Ft. Datum)
1					75SB02-00		SILT to GRAVEL, some clay; brown; dry to damp; non plastic loose (fill) 0.2	110.0
2		D-1	2.5 63%		75SB02-01	BKG	SILT to MEDIUM SAND (beach sand), little shells; whitish, light tan; dry to damp; non plastic; loose (fill)	
3								
4	4.0							
5							same as above and damp	
6		D-2	2.6 65%			BKG		
7								
8	8.0				75SB02-04			
9							same as above and wet/saturated (very little recovery)	
10		D-3	2.4 60%			BKG		

DRILLING CO.: GeoEnviroTech, Inc. BAKER REP.: Robert Roselius
DRILLER: William Rodrigez BORING NO.: 75SB02 SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Naval Activity Puerto Rico SWMU 75

SO NO.: 119197, 6.8 BORING NO.: 75SB02

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Elevation (Ft. Datum)
11		D-3	2.4			BKG	Continued from Sheet 1	
12	12.0		60%					98.2
13							End of Boring at 12.0'	
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: GeoEnviroTech, Inc. BAKER REP.: Robert Roselius

DRILLER: William Rodrigez BORING NO.: 75SB02 SHEET 2 OF 2

Baker
Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Naval Activity Puerto Rico SWMU 75
PROJ. NO.: 119197, 6.8 BORING NO.: 75SB03
COORDINATES: EAST: 939621.3314 NORTH: 798942.2900
ELEVATION SURFACE: 110.0

Rig:	Geoprobe Track Rig 6610 DT				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Macro Sampler	Casing	Augers	Core Barrel				
Size (ID)	1-5/8"	--	--	--	3/29/2010	0.0 - 12.0	sunny, mid+ 80s	
Length	4'	--	--	--				
Type	Acetate	--	--	--				
Hammer Wt	--	--	--	--				
Fall	--	--	--	--				

Remarks: PID background (BKG) is 0.0.

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BKG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Elevation (Ft. Datum)
1					75SB03-00		TOPSOIL (organics) 0.2	109.8
2		D-1	3.2 80%		75SB03-01	BKG	SILT to MEDIUM SAND (beach sand), little shells; whitish, light tan; dry to damp; non plastic; loose (fill)	
3								
4	4.0							
5							same as above and damp	
6		D-2	2.9 73%			BKG		
7								
8	8.0				75SB03-04			
9							same as above and moist	
10		D-3	3.2 80%			BKG		
							wet/saturated at 10.0'	

DRILLING CO.: GeoEnviroTech, Inc. BAKER REP.: Robert Roselius
DRILLER: William Rodrigez BORING NO.: 75SB03 SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Naval Activity Puerto Rico SWMU 75

SO NO.: 119197, 6.8 BORING NO.: 75SB03

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Elevation (Ft. Datum)
11		D-3	3.2			BKG	Continued from Sheet 1	
12	12.0		80%					98.0
13							End of Boring at 12.0'	
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: GeoEnviroTech, Inc. BAKER REP.: Robert Roselius

DRILLER: William Rodrigez BORING NO.: 75SB03 SHEET 2 OF 2

Baker
Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Naval Activity Puerto Rico SWMU 75
PROJ. NO.: 119197, 6.8 BORING NO.: 75SB04
COORDINATES: EAST: 939570.4991 NORTH: 798974.9104
ELEVATION: SURFACE: 110.4

Rig:	Geoprobe Track Rig 6610 DT				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Macro Sampler	Casing	Augers	Core Barrel				
Size (ID)	1-5/8"	--	--	--	3/29/2010	0.0 - 12.0	sunny, mid+ 80s	
Length	4'	--	--	--				
Type	Acetate	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks: PID background (BKG) is 0.0.

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BKG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Elevation (Ft. Datum)
1					75SB04-00 + duplicate		TOPSOIL (organics) 0.2 SILT to GRAVEL, some clay; brown; dry to damp; non plastic loose (fill) 1.3	110.2 109.1
2		D-1	2.6 65%		75SB04-01 +MS/MSD	BKG	SILT to MEDIUM SAND (beach sand), little shells; whitish, light tan; dry to damp; non plastic; loose (fill)	
3								
4	4.0							
5							same as above and damp	
6		D-2	2.8 70%			BKG		
7								
8	8.0				75SB04-04			
9							same as above and wet/saturated (very little recovery)	
10		D-3	1.2 30%			BKG		

DRILLING CO.: GeoEnviroTech, Inc. BAKER REP.: Robert Roselius
DRILLER: William Rodrigez BORING NO.: 75SB04 SHEET 1 OF 2

Baker

Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Naval Activity Puerto Rico SWMU 75

SO NO.: 119197, 6.8 BORING NO.: 75SB04

SAMPLE TYPE

S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston N = No Sample

DEFINITIONS

SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
ps/bg = point source/background

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Elevation (Ft. Datum)
11		D-3	1.2			BKG	Continued from Sheet 1	
12	12.0		30%					98.4
13							End of Boring at 12.0'	
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: GeoEnviroTech, Inc. BAKER REP.: Robert Roselius

DRILLER: William Rodrigez BORING NO.: 75SB04 SHEET 2 OF 2

Baker
Michael Baker Jr., Inc.

TEST BORING RECORD

PROJECT: Naval Activity Puerto Rico SWMU 75
PROJ. NO.: 119197, 6.8 BORING NO.: 75SB05
COORDINATES: EAST: 939578.8661 NORTH: 798963.3790
ELEVATION: SURFACE: 109.9

Rig:	Geoprobe Track Rig 6610 DT				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Macro Sampler	Casing	Augers	Core Barrel				
Size (ID)	1-5/8"	--	--	--	3/29/2010	0.0 - 12.0	sunny, mid+ 80s	
Length	4'	--	--	--				
Type	Acetate	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks: PID background (BKG) is 0.0.

SAMPLE TYPE
S = Split Spoon A = Auger
T = Shelby Tube W = Wash
R = Air Rotary C = Core
D = Denison P = Piston
N = No Sample

DEFINITIONS
SPT = Standard Penetration Test (ASTM D1586)
PID = Photo Ionization Detector Measurement
MSL = Mean Sea Level
BKG/PS = Background/Point Source
ppm = parts per million

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Elevation (Ft. Datum)
1					75SB05-00		TOPSOIL (organics) 0.1 SILT to MEDIUM SAND (beach sand), little shells;	109.8
2		D-1	2.2 55%		75SB05-01	BKG	whitish, light tan; dry to damp; non plastic; loose (fill)	
3								
4	4.0						DPT refusal at 4.0' (0.1' concrete in DPT sampler nose); terminate 75SB05 at 4.0'	105.9
5							End of Boring at 4.0'	
6								
7								
8								
9								
10								

DRILLING CO.: GeoEnviroTech, Inc. BAKER REP.: Robert Roselius
DRILLER: William Rodrigez BORING NO.: 75SB05 SHEET 1 OF 1

CHAIN-OF-CUSTODY FORMS

16060

103

Residual Chlorine Present? Yes ______ No ✓

SV + DRO: 1-8oz

CompuChem
a division of Liberty Analytical Corp.

CHAIN OF CUSTODY

501 Madison Ave.
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

Courier FedEx
Airbill No. 8685 9528 4743
Sampling Complete? (Y) or N

Client/Reporting Information

- Company Name: Baker Environmental, Inc.
- Address: 100 Airside Drive
- City: Moon Twp., State: PA, Zip: 15108
- Project Contact: Mark Kimes
- Phone #: 412-269-2009
- Sampler's Name: A. Gailey/R. Roselius

Project Information

- Project Name: SWMU 75
- Sampling Location: Puerto Rico
- Turnaround time: Standard
- Batch QC or Project Specific? If Specific, which Sample ID?
- Are aqueous samples field filtered for metals? Y or N
- Are high concentrations expected? Y or (N)? If yes, which ID(s)?

Matrices

GW - Ground water
WW - Waste water
SW - Surface water
SO - Soil/Sediment
TB - Trip Blank
RI - Rinsate
WP - Wipe
O - Other

Requested Analysis (include method and bottle type)

CompuChem No (Lab Use)	Field ID	Collection Date	Collection Time	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	MEOH	Other Sodium Bisulfate	App IX VOCs 40 ml	App IX SVOCs	App IX Metals (Total) 1-2oz	TPH DRO	TPH GRO 2-40 ml or 1-4oz						pH/Sample Info (Lab Use)
1003251-01	75FB01	3/29/10	0850	O	10	5		1				3	2	1	2	2						<2
-02	75ER01	↓	0900	RI	10	5		1				3	2	1	2	2						<2
1003252-01	75SB01-00		1140	SO	6					1	2	3	1	1	✓	1						
-02	75SB01-01		1145	↓	↓					↓	↓	↓	↓	↓	↓	↓						
-03	75SB01-01D		1145																			
-04	75SB01-04		1150														Container time is 11:55 3/31/10					
-05	75SB02-00		1115																			
-06	75SB02-01		1120														use per Allen					
-07	75SB02-04	↓	1125	↓	↓					↓	↓	↓	↓	⓪ ↓	↓	↓						
-08	75SB03-00	3/29/10	0935	SO	6					1	2	3	1	1	✓	1						

Lab Use Only

Sample Unpacked By: [signature]
Sample Order Entry By: [signature]
Samples Received in Good Condition? (Y) or N
If no, explain:

Cyanide samples checked for sulfide & chlorine? Y or (NA)
625 & Phenol samples checked for chlorine? Y or (NA)
608 samples checked for pH between 5.0-9.0? Y or (NA)

Comments

75SB02-04 Did not receive MHL sample.

Sample Custody

Relinquished by: [signature]	Date/Time: 3-30-10 1500	Received by: [signature]	Date/Time: 3-31-10 1015
Relinquished by:	Date/Time:	Received by:	Date/Time:
Subcontact? Y or (N) If yes, where?	Custody Seal(s) intact? (Y) or N	On Ice? (Y) or N	Cooler Temp: 1.0, 0.2, 2.4 °C

Samples stored 60 days after date report mailed at no extra charge.

White & Yellow copy to lab • Pink copy for customer

SN0015

16059

Page 2 of 3

104

SV + DROs = 1-8oz

CHAIN OF CUSTODY

CompuChem
a division of Liberty Analytical Corp.

501 Madison Ave.
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

Courier FedEx
Airbill No.
Sampling Complete? (Y) or N

Client/Reporting Information	Project Information
Company Name: Baker Environmental, Inc.	Project Name: SWMU 75
Address: 100 Airside Drive	Sampling Location: Puerto Rico
City: Moon Twp., State: PA Zip: 15108	Turnaround time: Standard
Project Contact: Mark Kimes	Batch QC or Project Specific? If Specific, which Sample ID?
Phone #: 412-269-2009	Are aqueous samples field filtered for metals? Y or N
Sampler's Name: A. Galley/R. Roselius	Are high concentrations expected? Y or N? If yes, which ID(s)?

Matrices: GW - Ground water; WW - Waste water; SW - Surface water; SO - Soil/Sediment; TB - Trip Blank; RI - Rinsate; WP - Wipe; O - Other

CompuChem No (Lab Use)	Field ID	Collection Date	Collection Time	Matrix	# of bottles	Number of Preserved Bottles: HCl	NaOH	HNO3	H2SO4	MEOH	Other Sodium Bisulfate	Requested Analysis: App IX VOCs (40 mL)	App IX SVOCs (1-2oz)	App IX Metals (Total) (1-2oz)	TPH DRO (2-40mL or 1-4oz)	TPH GRO (2-40mL or 1-4oz)	pH / Sample Info (Lab Use)
1003252-09	75SB03-01	3/29/10	0940	SO	6					1	2	3	1	1	✓	1	
-10	75SB03-04		0950														
-11	75SB04-00		1015														
-12	75SB04-00D		1015		6								↓	↓	↓	↓	
1003252-13	75SB04-01		1025		6							3	1	1	✓	1	
	75SB04-01 MS				3							3					
	75SB04-01 MSD				3					1	2	3					
	75SB04-01 MS/MSD		1025		3				APP 3/30/10 *		NVE 3/30/10	1	1	✓	1		
1003252-14	75SB04-04		1040	SO	6					1	2	3	1	1	✓	1	
1003251-03	75TB01	3/29/10		TB	5	5						3				2	

Lab Use Only

Sample Unpacked By: Diane Byrd
Sample Order Entry By: Diane Byrd
Samples Received in Good Condition? Y or N
If no, explain:

Cyanide samples checked for sulfide & chlorine? Y or NA
625 & Phenol samples checked for chlorine? Y or NA
608 samples checked for pH between 5.0-9.0? Y or NA

Comments

* Label on 2 VOA vials reads 75SB03- Time 0950

Sample Custody

Relinquished by:		Date/Time: 3-30-10 1500	Received by: Diane Byrd	Date/Time: 3.31.10 1015	
Relinquished by:		Date/Time:	Received by:	Date/Time:	
Subcontact? Y or N If yes, where?		Custody Seal(s) intact? Y or N	On Ice? Y or N	Cooler Temp: 1.0, 0.2	°C

Samples stored 60 days after date report mailed at no extra charge.

White & Yellow copy to lab • Pink copy for customer

SV0015

16058

CompuChem
a division of Liberty Analytical Corp.

CHAIN OF CUSTODY

501 Madison Ave.
Cary, NC 27513
Phone: 919-379-4100 Fax 919-379-4040

SV+ DRO = 1-8oz

Page 3 of 3

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Courier FedEx
Airbill No.
Sampling Complete? (Y) or N

Client/Reporting Information	Project Information	Requested Analysis (include method and bottle type)	Matrices
Company Name: Baker Environmental, Inc.	Project Name: SWMU 75		GW - Ground water WW - Waste water SW - Surface water SO - Soil/Sediment TB - Trip Blank RI - Rinsate WP - Wipe O - Other
Address: 100 Airside Drive	Sampling Location: Puerto Rico		
City: Moon Twp., State: PA Zip: 15108	Turnaround time: Standard		
Project Contact: Mark Kimes	Batch QC or Project Specific? If Specific, which Sample ID?		
Phone #: 412-269-2009	Are aqueous samples field filtered for metals? Y or N		
Sampler's Name: A. Gailey/R. Roselius	Are high concentrations expected? Y or N? If yes, which ID(s)?		pH / Sample Info (Lab Use)

CompuChem No (Lab Use)	Field ID	Collection Date	Collection Time	Matrix	# of bottles	Number of Preserved Bottles: HCl	NaOH	HNO3	H2SO4	MEOH	Other Sodium Bisulfate	App IX VOCs 40 ml	App IX SVOCs 1-2oz	App IX Metals (Total) 1-2oz	TPH DRO	TPH GRO 1-4oz
1003252-15	755B05-00	3/29/10	1000	SO	6					1	2	3	1	1	✓	1
↓ 16	755B05-01	3/29/10	1005	SO	6					1	2	3	1	1	✓	1

Lab Use Only

Sample Unpacked By: Dawn Byrd
Sample Order Entry By:
Samples Received in Good Condition? Y or N
If no, explain:

Cyanide samples checked for sulfide & chlorine? Y or (NA)
625 & Phenol samples checked for chlorine? Y or (NA)
608 samples checked for pH between 5.0-9.0? Y or (NA)

Comments

Sample Custody

Relinquished by:	Date/Time: 3-30-10 1500	Received by: Dawn Byrd	Date/Time: 3.31.10 1015
Relinquished by:	Date/Time:	Received by:	Date/Time:

Subcontact? Y or (N) If yes, where?
Custody Seal(s) intact? (Y) or N
On Ice? (Y) or N
Cooler Temp: 10.02 °C

Samples stored 60 days after date report mailed at no extra charge.

White & Yellow copy to lab • Pink copy for customer

SN005

APPENDIX C
LABORATORY ANALYTICAL RESULTS

SURFACE SOIL

APPENDIX C Revised: March 1, 2011

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB01	75SB02	75SB03	75SB04	75SB04	75SB05
Sample ID	75SB01-00	75SB02-00	75SB03-00	75SB04-00	75SB04-00D	75SB05-00
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
Volatiles (µg/kg)						
1,1,1,2-Tetrachloroethane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,1,1-Trichloroethane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,1,2,2-Tetrachloroethane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,1,2-Trichloroethane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,1-Dichloroethane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,1-Dichloroethene	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,2,3-Trichloropropane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,2-Dibromo-3-chloropropane (DBCP)	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,2-Dibromoethane (EDB)	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,2-Dichloroethane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,2-Dichloroethene (trans)	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,2-Dichloropropane	5.3 UJ	5.4 UJ	5.3 UJ	4.3 UJ	4 UJ	5.1 UJ
1,3-Dichloropropene (cis)	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,3-Dichloropropene (trans)	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
1,4-Dichloro-2-butene (trans)	21 U	21 U	21 U	17 U	16 U	20 U
1,4-Dioxane (p-)	270 R	270 R	270 R	210 R	200 R	260 R
2-Butanone (MEK)	13 U	13 U	13 U	11 U	10 U	13 U
2-Chloro-1,3-butadiene (Chloroprene)	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
2-Hexanone (MBK)	13 U	13 U	13 U	11 U	10 U	13 U
3-Chloropropene (Allyl Chloride)	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
4-Methyl-2-pentanone (MIBK)	13 U	13 U	13 U	11 U	10 U	13 U
Acetone	13 R	13 R	13 R	16 R	13 R	13 R
Acetonitrile	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Acrolein	53 R	54 R	53 R	43 R	40 R	51 R
Acrylonitrile	53 R	54 R	53 R	43 R	40 R	51 R
Benzene	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Bromodichloromethane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Bromoform	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Bromomethane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Carbon Disulfide	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Carbon Tetrachloride	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Chlorobenzene	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Chloroethane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Chloroform	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Chloromethane	5.3 UJ	5.4 UJ	5.3 UJ	4.3 UJ	4 UJ	5.1 UJ
Dibromochloromethane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Dibromomethane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Dichlorodifluoromethane (Freon-12)	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Ethyl Methacrylate	53 U	54 U	53 U	43 U	40 U	51 U
Ethylbenzene	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Isobutyl Alcohol	270 R	270 R	270 R	210 R	200 R	260 R

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB01	75SB02	75SB03	75SB04	75SB04	75SB05
Sample ID	75SB01-00	75SB02-00	75SB03-00	75SB04-00	75SB04-00D	75SB05-00
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
Volatiles (µg/kg) (Cont)						
Methyl Acrylonitrile	53 U	54 U	53 U	43 U	40 U	51 U
Methyl Iodide	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Methyl Methacrylate	53 R	54 R	53 R	43 R	40 R	51 R
Methylene Chloride	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Pentachloroethane	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Propionitrile (Ethyl Cyanide)	270 R	270 R	270 R	210 R	200 R	260 R
Styrene (Ethenylbenzene)	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Tetrachloroethene (PCE)	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Toluene	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Trichloroethene (TCE)	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Trichlorofluoromethane (Freon 11)	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Vinyl Acetate	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Vinyl Chloride	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Xylene, m/p-	11 U	11 U	11 U	8.6 U	8 U	10 U
Xylene, o-	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Xylenes, total	5.3 U	5.4 U	5.3 U	4.3 U	4 U	5.1 U
Semivolatiles (µg/kg)						
1,2,4,5-Tetrachlorobenzene	180 U	200 U	180 U	180 U	180 U	180 U
1,2,4-Trichlorobenzene	180 U	200 U	180 U	180 U	180 U	180 U
1,2-Dichlorobenzene (o-)	180 U	200 U	180 U	180 U	180 U	180 U
1,3,5-Trinitrobenzene (TNB)	180 U	200 U	180 U	180 U	180 U	180 U
1,3-Dichlorobenzene (m-)	180 U	200 U	180 U	180 U	180 U	180 U
1,3-Dinitrobenzene (m-)	180 U	200 U	180 U	180 U	180 U	180 U
1,4-Dichlorobenzene (p-)	180 U	200 U	180 U	180 U	180 U	180 U
1,4-Naphthoquinone	180 UJ	200 UJ	180 UJ	180 UJ	180 UJ	180 UJ
1,4-Phenylenediamine	1800 R	2000 R	1800 R	1800 R	1800 R	1800 R
1-Naphthylamine	180 U	200 U	180 U	180 UJ	180 U	180 U
2,2'-Oxybis[1-chloropropane]	180 U	200 U	180 U	180 U	180 U	180 U
2,3,4,6-Tetrachlorophenol	360 U	390 U	360 U	350 U	350 U	360 U
2,4,5-Trichlorophenol	360 U	390 U	360 U	350 U	350 U	360 U
2,4,6-Trichlorophenol	360 U	390 U	360 U	350 U	350 U	360 U
2,4-Dichlorophenol	360 UJ	390 UJ	360 UJ	350 UJ	350 U	360 UJ
2,4-Dimethylphenol	360 U	390 U	360 U	350 U	350 U	360 U
2,4-Dinitrophenol	360 U	390 U	360 U	350 U	350 U	360 U
2,4-Dinitrotoluene (DNT)	180 U	200 U	180 U	180 U	180 U	180 U
2,6-Dichlorophenol	360 UJ	390 U	360 U	350 U	350 U	360 U
2,6-Dinitrotoluene (DNT)	180 U	200 U	180 U	180 U	180 U	180 U
2-Acetylaminofluorene	180 U	200 UJ	180 UJ	180 U	180 U	180 UJ
2-Chloronaphthalene	180 U	200 U	180 U	180 U	180 U	180 U
2-Chlorophenol	360 U	390 U	360 U	350 U	350 U	360 U

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB01	75SB02	75SB03	75SB04	75SB04	75SB05
Sample ID	75SB01-00	75SB02-00	75SB03-00	75SB04-00	75SB04-00D	75SB05-00
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
Semivolatiles (µg/kg) (Cont)						
2-Methyl-5-nitroaniline	180 U	200 U	180 U	180 U	180 U	180 U
2-Methylphenol (o-Cresol)	360 U	390 U	360 U	350 U	350 U	360 U
2-Naphthylamine	180 U	200 U	180 U	180 U	180 U	180 U
2-Nitroaniline	180 U	200 U	180 U	180 U	180 U	180 U
2-Nitrophenol	360 U	390 U	360 U	350 U	350 U	360 U
2-Picoline	180 U	200 U	180 U	180 U	180 U	180 U
3,3'-Dichlorobenzidine	180 U	200 U	180 U	180 U	180 U	180 U
3,3'-Dimethylbenzidine	180 U	200 U	180 U	180 U	180 U	180 U
3-Methylcholanthrene	180 U	200 U	180 U	180 U	180 U	180 U
3-Methylphenol (m-Cresol)	270 U	300 U	270 U	260 U	260 U	270 U
3-Nitroaniline	360 U	390 U	360 U	350 U	350 U	360 U
4,6-Dinitro-2-methylphenol	360 U	390 U	360 U	350 U	350 U	360 U
4-Aminobiphenyl	180 U	200 U	180 U	180 U	180 U	180 U
4-Bromophenyl-phenylether	180 U	200 U	180 U	180 U	180 U	180 U
4-Chloro-3-methylphenol	360 U	390 U	360 U	350 U	350 U	360 U
4-Chloroaniline	360 U	390 U	360 U	350 U	350 UJ	360 U
4-Chlorophenyl-phenylether	180 U	200 U	180 U	180 U	180 U	180 U
4-Dimethylaminoazobenzene (p-)	180 U	200 U	180 U	180 U	180 U	180 U
4-Methylphenol (p-Cresol)	270 U	300 U	270 U	260 U	260 U	270 U
4-Nitroaniline	360 U	390 U	360 U	350 U	350 U	360 U
4-Nitrophenol	360 U	390 U	360 U	350 U	350 U	360 U
4-Nitroquinoline-1-oxide	180 UJ	200 UJ	180 UJ	180 UJ	180 UJ	180 UJ
7,12-Dimethylbenz(a)anthracene	180 UJ	200 UJ	180 UJ	180 UJ	180 UJ	180 UJ
Acetophenone	180 U	200 U	180 U	180 U	180 U	180 U
Aniline	180 U	200 UJ	180 UJ	180 U	180 UJ	180 UJ
Aramite	180 U	200 UJ	180 UJ	180 U	180 U	180 UJ
Benzyl Alcohol	180 UJ	200 UJ	180 UJ	180 UJ	180 UJ	180 UJ
Bis(2-chloroethoxy)methane	180 U	200 U	180 U	180 U	180 U	180 U
Bis(2-chloroethyl)ether	180 U	200 U	180 U	180 U	180 U	180 U
Bis(2-ethylhexyl) Phthalate (BEHP)	76 J	200 U	44 J	70 J	44 J	880
Butyl Benzyl Phthalate	62 J	200 U	180 U	180 U	180 U	180 U
Diallate (cis)	180 U	200 U	180 U	180 U	180 U	180 U
Diallate (total)	180 U	200 U	180 U	180 U	180 U	180 U
Diallate (trans)	180 UJ	200 UJ	180 UJ	180 UJ	180 UJ	180 UJ
Dibenzofuran	30 J	200 U	180 U	180 U	180 U	180 U
Diethyl Phthalate (DEP)	180 U	200 U	180 U	180 U	180 U	180 U
Dimethyl Phthalate	180 U	200 U	180 U	180 U	180 U	180 U
Di-n-butyl Phthalate (DBP)	180 U	200 U	180 U	180 U	180 U	180 U
Di-n-octyl Phthalate	180 U	200 U	180 U	180 U	180 U	180 U
Dinoseb	180 U	200 U	180 U	180 U	180 UJ	180 U
Ethyl Methane Sulfonate (EMS)	180 U	200 U	180 U	180 U	180 U	180 U

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB01	75SB02	75SB03	75SB04	75SB04	75SB05
Sample ID	75SB01-00	75SB02-00	75SB03-00	75SB04-00	75SB04-00D	75SB05-00
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
Semivolatiles (µg/kg) (Cont)						
Hexachloro-1,3-butadiene	180 U	200 U	180 U	180 U	180 U	180 U
Hexachlorobenzene	180 U	200 U	180 U	180 U	180 U	180 U
Hexachlorocyclopentadiene	180 U	200 U	180 U	180 U	180 U	180 U
Hexachloroethane	180 U	200 U	180 U	180 U	180 U	180 U
Hexachloropropene	180 UJ	200 UJ	180 UJ	180 UJ	180 UJ	180 UJ
Isophorone	180 U	200 U	180 U	180 U	180 U	180 U
Isosafrole	180 U	200 U	180 U	180 U	180 U	180 U
Methapyrilene	180 R	200 R	180 R	180 R	180 U	180 R
Methyl Methane Sulfonate	180 U	200 U	180 U	180 U	180 U	180 U
Nitrobenzene	180 U	200 U	180 U	180 U	180 U	180 U
n-Nitrosodiethylamine	180 U	200 U	180 U	180 U	180 U	180 U
n-Nitrosodimethylamine (NDMA)	180 U	200 U	180 U	180 U	180 U	180 U
n-Nitroso-di-n-butylamine	180 U	200 U	180 U	180 U	180 U	180 U
n-Nitrosodi-n-propylamine	180 U	200 U	180 U	180 U	180 U	180 U
n-Nitrosodiphenylamine	180 U	200 U	180 U	180 U	180 U	180 U
n-Nitrosomethylethylamine	180 U	200 U	180 U	180 U	180 U	180 U
n-Nitrosomorpholine	180 U	200 U	180 U	180 U	180 U	180 U
n-Nitrosopiperidine	180 U	200 U	180 U	180 U	180 U	180 U
n-Nitrosopyrrolidine	180 U	200 U	180 U	180 U	180 U	180 U
o-Toluidine	180 U	200 U	180 U	180 U	180 U	180 U
Pentachlorobenzene	180 U	200 U	180 U	180 U	180 U	180 U
Pentachloronitrobenzene	180 U	200 U	180 U	180 U	180 U	180 U
Pentachlorophenol	360 U	390 U	360 U	350 U	350 U	360 U
Phenacetin	180 U	200 U	180 U	180 U	180 U	180 U
Phenol	360 U	390 U	360 U	350 U	350 U	360 U
Pronamide	360 U	390 U	360 U	350 U	350 U	360 U
Pyridine	180 U	200 UJ	180 UJ	180 U	180 U	180 UJ
Safrole	180 U	200 U	180 U	180 U	180 U	180 U

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB01	75SB02	75SB03	75SB04	75SB04	75SB05
Sample ID	75SB01-00	75SB02-00	75SB03-00	75SB04-00	75SB04-00D	75SB05-00
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
PAHs (µg/kg)						
2-Methylnaphthalene	9 U	9.9 U	9 U	8.8 U	0.72 J	9 U
Acenaphthene	42	9.9 U	9 U	8.8 U	8.7 U	9 U
Acenaphthylene	12	2.6 J	68	3.2 J	3.5 J	22
Anthracene	570	9.9 U	72	8.8 U	4.9 J	25
Benzo(a)anthracene	1300 J	9.9 UJ	95 J	8.8 UJ	31	91 J
Benzo(a)pyrene (BaP)	840	12	130	12 J	34 J	88
Benzo(b)fluoranthene	720	9.6 J	260	18 JN	39 J	120 J
Benzo(g,h,i)perylene	460	15 J	310	38 J	31	56 J
Benzo(k)fluoranthene	1100 J	8.5 J	300	17 JN	47 J	110 J
Chrysene	940	6.6 J	88	11 J	27 J	87
Dibenz(a,h)anthracene	60 J	3.4 J	36 J	8.8 U	8.7 U	16 J
Fluoranthene	2300 J	10	85	13 J	41 J	170
Fluorene	37	9.9 U	9 U	8.8 U	8.7 U	9 U
Indeno(1,2,3-cd)pyrene	690 J	16 J	330 J	18 J	30 J	80 J
Naphthalene	9 U	9.9 U	9 U	8.8 U	0.99 J	9 U
Phenanthrene	1700 J	9.9 U	13	8.8 U	3.9 J	15
Pyrene	1800 J	9.9 U	77	14 J	43 J	140
PAH totals (µg/kg)						
Low molecular weight PAHs	4679	72	274	69	72.41	268
High molecular weight PAHs	7910	90.9	1626	145.6	290.7	788
TPH (mg/kg)						
Diesel Range Organics (DRO)	11 U	12 U	30	11 U	12	11 U
Gasoline Range Organics (GRO)	0.54 UJ	0.6 UJ	0.54 UJ	0.53 UJ	0.53 UJ	0.54 UJ
Total TPH	11 U	12 U	30	11 U	12	11 U

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB01	75SB02	75SB03	75SB04	75SB04	75SB05
Sample ID	75SB01-00	75SB02-00	75SB03-00	75SB04-00	75SB04-00D	75SB05-00
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
Inorganics (mg/kg)						
Antimony	1.1 UJ	1.2 UJ	1 UJ	1 UJ	1 UJ	1.1 UJ
Arsenic	1.4 J	2.8 J	2.4 J	1 J	0.52 UJ	3.9 J
Barium	16.1	11.2	23.8	86.5	101	52.8
Beryllium	0.54 U	0.58 U	0.52 U	0.11 J	0.12 J	0.078 J
Cadmium	0.95	0.085 J	0.37 J	0.27 J	0.22 J	0.2 J
Chromium	9.7	5.4	12.1	14	14.9	9.1
Cobalt	1.7	1.4	2.5	11.4	13.2	3.7
Copper	23	6.5	22.2	74.3	90.9	19.5
Lead	45.9	1.5	37	6.6 R	1.9 R	9.8
Mercury	0.018 J	0.039 U	0.036 U	0.009 J	0.035 U	0.007 J
Nickel	5.9	4.9	5.7	7.7	7.4	6.3
Selenium	0.33 J	0.45 J	0.31 J	0.37 J	0.27 J	0.46 J
Silver	0.41 J	0.062 J	0.089 J	0.1 J	0.1 J	0.095 J
Thallium	0.14 J	0.038 J	0.042 J	0.099 J	0.1 J	0.059 J
Tin	5.4 U	5.8 U	5.2 U	5.2 U	5.2 U	5.4 U
Vanadium	11.9 J	6.7 J	20.1 J	81.2 J	85.1 J	25.6 J
Zinc	84.3	6.9	22.5	61.6	61.4	30.6

Notes:

ft bgs - feet below ground surface
µg/kg - micrograms per kilogram
mg/kg - milligrams per kilogram

U - Not detected
UJ - Reported quantitation limit is qualified as estimated
J - Analyte present - Reported value is estimated
R - Result is rejected and unusable

SUBSURFACE SOIL

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB01	75SB01	75SB01	75SB02	75SB02
Sample ID	75SB01-01	75SB01-01D	75SB01-04	75SB02-01	75SB02-04
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	1.0-3.0	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0
Volatiles (µg/kg)					
1,1,1,2-Tetrachloroethane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,1,1-Trichloroethane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,1,2,2-Tetrachloroethane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,1,2-Trichloroethane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,1-Dichloroethane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,1-Dichloroethene	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,2,3-Trichloropropane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,2-Dibromo-3-chloropropane (DBCP)	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,2-Dibromoethane (EDB)	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,2-Dichloroethane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,2-Dichloroethene (trans)	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,2-Dichloropropane	4.9 UJ	5.4 UJ	6.4 UJ	4.9 UJ	6.2 UJ
1,3-Dichloropropene (cis)	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,3-Dichloropropene (trans)	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
1,4-Dichloro-2-butene (trans)	20 U	22 U	26 U	20 U	25 U
1,4-Dioxane (p-)	240 R	270 R	320 R	250 R	310 R
2-Butanone (MEK)	12 U	14 U	16 U	12 U	16 U
2-Chloro-1,3-butadiene (Chloroprene)	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
2-Hexanone (MBK)	12 U	14 U	16 U	12 U	16 U
3-Chloropropene (Allyl Chloride)	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
4-Methyl-2-pentanone (MIBK)	12 U	14 U	16 U	12 U	16 U
Acetone	24 R	14 R	16 R	12 R	16 R
Acetonitrile	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Acrolein	49 R	54 R	64 R	49 R	62 R
Acrylonitrile	49 R	54 R	64 R	49 R	62 R
Benzene	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Bromodichloromethane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Bromoform	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Bromomethane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Carbon Disulfide	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Carbon Tetrachloride	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Chlorobenzene	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Chloroethane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Chloroform	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Chloromethane	4.9 UJ	5.4 UJ	6.4 UJ	4.9 UJ	6.2 UJ
Dibromochloromethane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Dibromomethane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Dichlorodifluoromethane (Freon-12)	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Ethyl Methacrylate	49 U	54 U	64 U	49 U	62 U
Ethylbenzene	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Isobutyl Alcohol	240 R	270 R	320 R	250 R	310 R

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB01	75SB01	75SB01	75SB02	75SB02
Sample ID	75SB01-01	75SB01-01D	75SB01-04	75SB02-01	75SB02-04
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	1.0-3.0	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0
Volatiles (µg/kg) (Cont)					
Methyl Acrylonitrile	49 U	54 U	64 U	49 U	62 U
Methyl Iodide	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Methyl Methacrylate	49 R	54 R	64 R	49 R	62 R
Methylene Chloride	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Pentachloroethane	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Propionitrile (Ethyl Cyanide)	240 R	270 R	320 R	250 R	310 R
Styrene (Ethenylbenzene)	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Tetrachloroethene (PCE)	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Toluene	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Trichloroethene (TCE)	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Trichlorofluoromethane (Freon 11)	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Vinyl Acetate	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Vinyl Chloride	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Xylene, m/p-	9.8 U	11 U	13 U	9.8 U	12 U
Xylene, o-	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Xylenes, total	4.9 U	5.4 U	6.4 U	4.9 U	6.2 U
Semivolatiles (µg/kg)					
1,2,4,5-Tetrachlorobenzene	190 U	190 U	220 U	190 U	220 U
1,2,4-Trichlorobenzene	190 U	190 U	220 U	190 U	220 U
1,2-Dichlorobenzene (o-)	190 U	190 U	220 U	190 U	220 U
1,3,5-Trinitrobenzene (TNB)	190 U	190 U	220 U	190 U	220 U
1,3-Dichlorobenzene (m-)	190 U	190 U	220 U	190 U	220 U
1,3-Dinitrobenzene (m-)	190 U	190 U	220 U	190 U	220 U
1,4-Dichlorobenzene (p-)	190 U	190 U	220 U	190 U	220 U
1,4-Naphthoquinone	190 UJ	190 UJ	220 UJ	190 UJ	220 UJ
1,4-Phenylenediamine	1900 R	1900 R	2200 R	1900 R	2200 R
1-Naphthylamine	190 U	190 U	220 U	190 U	220 U
2,2'-Oxybis[1-chloropropane]	190 U	190 U	220 U	190 U	220 U
2,3,4,6-Tetrachlorophenol	360 U	370 U	420 U	360 U	420 U
2,4,5-Trichlorophenol	360 U	370 U	420 U	360 U	420 U
2,4,6-Trichlorophenol	360 U	370 U	420 U	360 U	420 U
2,4-Dichlorophenol	360 UJ	370 UJ	420 UJ	360 UJ	420 UJ
2,4-Dimethylphenol	360 U	370 U	420 U	360 U	420 U
2,4-Dinitrophenol	360 U	370 U	420 U	360 U	420 U
2,4-Dinitrotoluene (DNT)	190 U	190 U	220 U	190 U	220 U
2,6-Dichlorophenol	360 UJ	370 U	420 UJ	360 U	420 U
2,6-Dinitrotoluene (DNT)	190 U	190 U	220 U	190 U	220 U
2-Acetylaminofluorene	190 U	190 UJ	220 U	190 UJ	220 UJ
2-Chloronaphthalene	190 U	190 U	220 U	190 U	220 U
2-Chlorophenol	360 U	370 U	420 U	360 U	420 U

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB01	75SB01	75SB01	75SB02	75SB02
Sample ID	75SB01-01	75SB01-01D	75SB01-04	75SB02-01	75SB02-04
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	1.0-3.0	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0
Semivolatiles (µg/kg) (Cont)					
2-Methyl-5-nitroaniline	190 U	190 U	220 U	190 U	220 U
2-Methylphenol (o-Cresol)	360 U	370 U	420 U	360 U	420 U
2-Naphthylamine	190 U	190 U	220 U	190 U	220 U
2-Nitroaniline	190 U	190 U	220 U	190 U	220 U
2-Nitrophenol	360 U	370 U	420 U	360 U	420 U
2-Picoline	190 U	190 U	220 U	190 U	220 U
3,3'-Dichlorobenzidine	190 U	190 U	220 U	190 U	220 U
3,3'-Dimethylbenzidine	190 U	190 U	220 U	190 U	220 U
3-Methylcholanthrene	190 U	190 U	220 U	190 U	220 U
3-Methylphenol (m-Cresol)	270 U	280 U	320 U	270 U	320 U
3-Nitroaniline	360 U	370 U	420 U	360 U	420 U
4,6-Dinitro-2-methylphenol	360 U	370 U	420 U	360 U	420 U
4-Aminobiphenyl	190 U	190 U	220 U	190 U	220 U
4-Bromophenyl-phenylether	190 U	190 U	220 U	190 U	220 U
4-Chloro-3-methylphenol	360 U	370 U	420 U	360 U	420 U
4-Chloroaniline	360 U	370 U	420 U	360 U	420 U
4-Chlorophenyl-phenylether	190 U	190 U	220 U	190 U	220 U
4-Dimethylaminoazobenzene (p-)	190 U	190 U	220 U	190 U	220 U
4-Methylphenol (p-Cresol)	270 U	280 U	320 U	270 U	320 U
4-Nitroaniline	360 U	370 U	420 U	360 U	420 U
4-Nitrophenol	360 U	370 U	420 U	360 U	420 U
4-Nitroquinoline-1-oxide	190 UJ	190 UJ	220 UJ	190 UJ	220 UJ
7,12-Dimethylbenz(a)anthracene	190 UJ	190 UJ	220 UJ	190 UJ	220 UJ
Acetophenone	190 U	190 U	220 U	190 U	220 U
Aniline	190 U	190 UJ	220 U	190 UJ	220 UJ
Aramite	190 U	190 UJ	220 U	190 UJ	220 UJ
Benzyl Alcohol	190 UJ	190 UJ	220 UJ	190 UJ	220 UJ
Bis(2-chloroethoxy)methane	190 U	190 U	220 U	190 U	220 U
Bis(2-chloroethyl)ether	190 U	190 U	220 U	190 U	220 U
Bis(2-ethylhexyl) Phthalate (BEHP)	190 U	190 U	75 J	190 U	220 U
Butyl Benzyl Phthalate	190 U	190 U	220 U	110 J	220 U
Diallate (cis)	190 U	190 U	220 U	190 U	220 U
Diallate (total)	190 U	190 U	220 U	190 U	220 U
Diallate (trans)	190 UJ	190 UJ	220 UJ	190 UJ	220 UJ
Dibenzofuran	190 U	190 U	220 U	190 U	220 U
Diethyl Phthalate (DEP)	190 U	190 U	220 U	190 U	220 U
Dimethyl Phthalate	190 U	190 U	220 U	190 U	220 U
Di-n-butyl Phthalate (DBP)	190 U	190 U	220 U	190 U	220 U
Di-n-octyl Phthalate	190 U	190 U	220 U	190 U	220 U
Dinoseb	190 U	190 U	220 U	190 U	220 U
Ethyl Methane Sulfonate (EMS)	190 U	190 U	220 U	190 U	220 U

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB01	75SB01	75SB01	75SB02	75SB02
Sample ID	75SB01-01	75SB01-01D	75SB01-04	75SB02-01	75SB02-04
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	1.0-3.0	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0
Semivolatiles (µg/kg) (Cont)					
Hexachloro-1,3-butadiene	190 U	190 U	220 U	190 U	220 U
Hexachlorobenzene	190 U	190 U	220 U	190 U	220 U
Hexachlorocyclopentadiene	190 U	190 U	220 U	190 U	220 U
Hexachloroethane	190 U	190 U	220 U	190 U	220 U
Hexachloropropene	190 UJ	190 UJ	220 UJ	190 UJ	220 UJ
Isophorone	190 U	190 U	220 U	190 U	220 U
Isosafrole	190 U	190 U	220 U	190 U	220 U
Methapyrilene	190 R	190 R	220 R	190 R	220 R
Methyl Methane Sulfonate	190 U	190 U	220 U	190 U	220 U
Nitrobenzene	190 U	190 U	220 U	190 U	220 U
n-Nitrosodiethylamine	190 U	190 U	220 U	190 U	220 U
n-Nitrosodimethylamine (NDMA)	190 U	190 U	220 U	190 U	220 U
n-Nitroso-di-n-butylamine	190 U	190 U	220 U	190 U	220 U
n-Nitrosodi-n-propylamine	190 U	190 U	220 U	190 U	220 U
n-Nitrosodiphenylamine	190 U	190 U	220 U	190 U	220 U
n-Nitrosomethylethylamine	190 U	190 U	220 U	190 U	220 U
n-Nitrosomorpholine	190 U	190 U	220 U	190 U	220 U
n-Nitrosopiperidine	190 U	190 U	220 U	190 U	220 U
n-Nitrosopyrrolidine	190 U	190 U	220 U	190 U	220 U
o-Toluidine	190 U	190 U	220 U	190 U	220 U
Pentachlorobenzene	190 U	190 U	220 U	190 U	220 U
Pentachloronitrobenzene	190 U	190 U	220 U	190 U	220 U
Pentachlorophenol	360 U	370 U	420 U	360 U	420 U
Phenacetin	190 U	190 U	220 U	190 U	220 U
Phenol	360 U	370 U	420 U	360 U	420 U
Pronamide	360 U	370 U	420 U	360 U	420 U
Pyridine	190 U	190 UJ	220 U	190 UJ	220 UJ
Safrole	190 U	190 U	220 U	190 U	220 U

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB01	75SB01	75SB01	75SB02	75SB02
Sample ID	75SB01-01	75SB01-01D	75SB01-04	75SB02-01	75SB02-04
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	1.0-3.0	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0
PAHs (µg/kg)					
2-Methylnaphthalene	9.1 U	190 U	11 U	9.1 U	11 U
Acenaphthene	9.1 U	190 U	11 U	9.1 U	11 U
Acenaphthylene	21	190 U	11 U	5 J	0.99 J
Anthracene	40	25 J	11 U	16	11 U
Benzo(a)anthracene	36 J	120 J	11 UJ	71 J	11 UJ
Benzo(a)pyrene (BaP)	72	200 J	11 U	47	1.1 J
Benzo(b)fluoranthene	57 J	260 J	11 UJ	37 J	1.3 J
Benzo(g,h,i)perylene	73 J	110 J	11 U	32 J	1.4 J
Benzo(k)fluoranthene	60 J	260 J	11 UJ	33 J	1.6 J
Chrysene	37	170 J	11 U	50	0.92 J
Dibenz(a,h)anthracene	17 J	30 J	11 U	9.5 J	11 UJ
Fluoranthene	24	62 J	11 U	110	11 U
Fluorene	9.1 U	190 U	11 U	9.1 U	11 U
Indeno(1,2,3-cd)pyrene	87 J	120 J	11 UJ	46 J	1.9 J
Naphthalene	9.1 U	190 U	11 U	9.1 U	11 U
Phenanthrene	9.1 U	190 U	11 U	41	11 U
Pyrene	32	110 J	11 U	87	11 U
PAH totals (µg/kg)					
Low molecular weight PAHs	130.5	1227	88	208.4	77.99
High molecular weight PAHs	471	1380	99	412.5	41.22
TPH (mg/kg)					
Diesel Range Organics (DRO)	25	11 U	13 U	11 U	13 U
Gasoline Range Organics (GRO)	0.55 UJ	0.56 UJ	0.64 UJ	0.55 UJ	0.63 UJ
Total TPH	25	11 U	13 U	11 U	13 U

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB01	75SB01	75SB01	75SB02	75SB02
Sample ID	75SB01-01	75SB01-01D	75SB01-04	75SB02-01	75SB02-04
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	1.0-3.0	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0
Inorganics (mg/kg)					
Antimony	1 UJ	1.1 UJ	1.2 UJ	1.1 UJ	1.2 UJ
Arsenic	2.8 J	3 J	2.6 J	3.4 J	2.1 J
Barium	16 J	16.3	6.8	15.5	6.4
Beryllium	0.046 J	0.55 U	0.59 U	0.54 U	0.61 U
Cadmium	0.95 J	0.77	0.59 U	0.74	0.61 U
Chromium	14.8	13.5	2.5	10	2.3
Cobalt	2.7	2.7	0.55 J	2.6	0.53 J
Copper	58.4	41.4	2.1	15.1	1.7
Lead	76.6	68.9	0.58 J	22.3	0.28 J
Mercury	0.021 J	0.022 J	0.042 U	0.012 J	0.042 U
Nickel	7.5	6.2	4.2	5.9	4.1
Selenium	0.38 J	0.39 J	0.33 J	0.43 J	0.28 J
Silver	1.9 J	0.9	0.059 J	0.078 J	0.61 U
Thallium	0.079 J	0.065 J	0.044 J	0.074 J	0.032 J
Tin	5.2 U	5.5 U	5.9 U	5.4 U	6.1 U
Vanadium	17 J	18.5 J	2.8 J	17.1 J	2.8 J
Zinc	100	80.5	2 J	48.1	1.7 J

Notes:

ft bgs - feet below ground surface
µg/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
NA - Not Analyzed

U - Not detected
UJ - Reported quantitation limit is qualified as estimated
J - Analyte present - Reported value is estimated
R - Result is rejected and unusable

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB03	75SB03	75SB04	75SB04	75SB05
Sample ID	75SB03-01	75SB03-04	75SB04-01	75SB04-04	75SB05-01
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0	1.0-3.0
Volatiles (µg/kg)					
1,1,1,2-Tetrachloroethane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,1,1-Trichloroethane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,1,2,2-Tetrachloroethane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,1,2-Trichloroethane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,1-Dichloroethane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,1-Dichloroethene	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,2,3-Trichloropropane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,2-Dibromo-3-chloropropane (DBCP)	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,2-Dibromoethane (EDB)	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,2-Dichloroethane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,2-Dichloroethene (trans)	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,2-Dichloropropane	4.8 UJ	6 UJ	5.1 UJ	5.7 UJ	5.5 UJ
1,3-Dichloropropene (cis)	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,3-Dichloropropene (trans)	4.8 U	6 U	5.1 U	5.7 U	5.5 U
1,4-Dichloro-2-butene (trans)	19 U	24 U	20 U	23 U	22 U
1,4-Dioxane (p-)	240 R	300 R	260 R	280 R	270 R
2-Butanone (MEK)	12 U	15 U	13 U	14 U	14 U
2-Chloro-1,3-butadiene (Chloroprene)	4.8 U	6 U	5.1 U	5.7 U	5.5 U
2-Hexanone (MBK)	12 U	15 U	13 U	14 U	14 U
3-Chloropropene (Allyl Chloride)	4.8 U	6 U	5.1 U	5.7 U	5.5 U
4-Methyl-2-pentanone (MIBK)	12 U	15 U	13 U	14 U	14 U
Acetone	12 R	15 R	25 R	14 R	14 R
Acetonitrile	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Acrolein	48 R	60 R	51 R	57 R	55 R
Acrylonitrile	48 R	60 R	51 R	57 R	55 R
Benzene	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Bromodichloromethane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Bromoform	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Bromomethane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Carbon Disulfide	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Carbon Tetrachloride	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Chlorobenzene	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Chloroethane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Chloroform	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Chloromethane	4.8 UJ	6 UJ	5.1 UJ	5.7 UJ	5.5 UJ
Dibromochloromethane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Dibromomethane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Dichlorodifluoromethane (Freon-12)	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Ethyl Methacrylate	48 U	60 U	51 U	57 U	55 U
Ethylbenzene	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Isobutyl Alcohol	240 R	300 R	260 R	280 R	270 R

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NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB03	75SB03	75SB04	75SB04	75SB05
Sample ID	75SB03-01	75SB03-04	75SB04-01	75SB04-04	75SB05-01
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0	1.0-3.0
Volatiles (µg/kg) (Cont)					
Methyl Acrylonitrile	48 U	60 U	51 U	57 U	55 U
Methyl Iodide	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Methyl Methacrylate	48 R	60 R	51 R	57 R	55 R
Methylene Chloride	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Pentachloroethane	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Propionitrile (Ethyl Cyanide)	240 R	300 R	260 R	280 R	270 R
Styrene (Ethenylbenzene)	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Tetrachloroethene (PCE)	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Toluene	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Trichloroethene (TCE)	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Trichlorofluoromethane (Freon 11)	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Vinyl Acetate	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Vinyl Chloride	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Xylene, m/p-	9.7 U	12 U	10 U	11 U	11 U
Xylene, o-	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Xylenes, total	4.8 U	6 U	5.1 U	5.7 U	5.5 U
Semivolatiles (µg/kg)					
1,2,4,5-Tetrachlorobenzene	210 U	200 U	190 U	200 U	190 U
1,2,4-Trichlorobenzene	210 U	200 U	190 U	200 U	190 U
1,2-Dichlorobenzene (o-)	210 U	200 U	190 U	200 U	190 U
1,3,5-Trinitrobenzene (TNB)	210 U	200 U	190 U	200 U	190 U
1,3-Dichlorobenzene (m-)	210 U	200 U	190 U	200 U	190 U
1,3-Dinitrobenzene (m-)	210 U	200 U	190 U	200 U	190 U
1,4-Dichlorobenzene (p-)	210 U	200 U	190 U	200 U	190 U
1,4-Naphthoquinone	210 UJ	200 UJ	190 UJ	200 UJ	190 UJ
1,4-Phenylenediamine	2100 R	2000 R	1900 R	2000 R	1900 R
1-Naphthylamine	210 U	200 U	190 U	200 U	190 U
2,2'-Oxybis[1-chloropropane]	210 U	200 U	190 U	200 U	190 U
2,3,4,6-Tetrachlorophenol	400 U	390 U	370 U	400 U	360 U
2,4,5-Trichlorophenol	400 U	390 U	370 U	400 U	360 U
2,4,6-Trichlorophenol	400 U	390 U	370 U	400 U	360 U
2,4-Dichlorophenol	400 UJ	390 UJ	370 UJ	400 UJ	360 UJ
2,4-Dimethylphenol	400 U	390 U	370 U	400 U	360 U
2,4-Dinitrophenol	400 U	390 U	370 U	400 U	360 U
2,4-Dinitrotoluene (DNT)	210 U	200 U	190 U	200 U	190 U
2,6-Dichlorophenol	400 U	390 U	370 UJ	400 U	360 U
2,6-Dinitrotoluene (DNT)	210 U	200 U	190 U	200 U	190 U
2-Acetylaminofluorene	210 UJ	200 UJ	190 U	200 UJ	190 UJ
2-Chloronaphthalene	210 U	200 U	190 U	200 U	190 U
2-Chlorophenol	400 U	390 U	370 U	400 U	360 U

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NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB03	75SB03	75SB04	75SB04	75SB05
Sample ID	75SB03-01	75SB03-04	75SB04-01	75SB04-04	75SB05-01
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0	1.0-3.0
Semivolatiles (µg/kg) (Cont)					
2-Methyl-5-nitroaniline	210 U	200 U	190 U	200 U	190 U
2-Methylphenol (o-Cresol)	400 U	390 U	370 U	400 U	360 U
2-Naphthylamine	210 U	200 U	190 U	200 U	190 U
2-Nitroaniline	210 U	200 U	190 U	200 U	190 U
2-Nitrophenol	400 U	390 U	370 U	400 U	360 U
2-Picoline	210 U	200 U	190 U	200 U	190 U
3,3'-Dichlorobenzidine	210 U	200 U	190 U	200 U	190 U
3,3'-Dimethylbenzidine	210 U	200 U	190 U	200 U	190 U
3-Methylcholanthrene	210 U	200 U	190 U	200 U	190 U
3-Methylphenol (m-Cresol)	300 U	300 U	280 U	300 U	270 U
3-Nitroaniline	400 U	390 U	370 U	400 U	360 U
4,6-Dinitro-2-methylphenol	400 U	390 U	370 U	400 U	360 U
4-Aminobiphenyl	210 U	200 U	190 U	200 U	190 U
4-Bromophenyl-phenylether	210 U	200 U	190 U	200 U	190 U
4-Chloro-3-methylphenol	400 U	390 U	370 U	400 U	360 U
4-Chloroaniline	400 U	390 U	370 U	400 U	360 U
4-Chlorophenyl-phenylether	210 U	200 U	190 U	200 U	190 U
4-Dimethylaminoazobenzene (p-)	210 U	200 U	190 U	200 U	190 U
4-Methylphenol (p-Cresol)	300 U	300 U	280 U	300 U	270 U
4-Nitroaniline	400 U	390 U	370 U	400 U	360 U
4-Nitrophenol	400 U	390 U	370 U	400 U	360 U
4-Nitroquinoline-1-oxide	210 UJ	200 UJ	190 UJ	200 UJ	190 UJ
7,12-Dimethylbenz(a)anthracene	210 UJ	200 UJ	190 UJ	200 UJ	190 UJ
Acetophenone	210 U	200 U	190 U	200 U	190 U
Aniline	210 UJ	200 UJ	190 U	200 UJ	190 UJ
Aramite	210 UJ	200 UJ	190 U	200 UJ	190 UJ
Benzyl Alcohol	210 UJ	200 UJ	190 UJ	200 UJ	190 UJ
Bis(2-chloroethoxy)methane	210 U	200 U	190 U	200 U	190 U
Bis(2-chloroethyl)ether	210 U	200 U	190 U	200 U	190 U
Bis(2-ethylhexyl) Phthalate (BEHP)	210 U	200 U	42 J	200 U	77 J
Butyl Benzyl Phthalate	210 U	200 U	190 U	200 U	190 U
Diallate (cis)	210 U	200 U	190 U	200 U	190 U
Diallate (total)	210 U	200 U	190 U	200 U	190 U
Diallate (trans)	210 UJ	200 UJ	190 UJ	200 UJ	190 UJ
Dibenzofuran	210 U	200 U	190 U	200 U	190 U
Diethyl Phthalate (DEP)	210 U	200 U	190 U	200 U	190 U
Dimethyl Phthalate	210 U	200 U	190 U	200 U	190 U
Di-n-butyl Phthalate (DBP)	210 U	200 U	190 U	200 U	190 U
Di-n-octyl Phthalate	210 U	200 U	190 U	200 U	190 U
Dinoseb	210 U	200 U	190 U	200 U	190 U
Ethyl Methane Sulfonate (EMS)	210 U	200 U	190 U	200 U	190 U

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB03	75SB03	75SB04	75SB04	75SB05
Sample ID	75SB03-01	75SB03-04	75SB04-01	75SB04-04	75SB05-01
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0	1.0-3.0
Semivolatiles (µg/kg) (Cont)					
Hexachloro-1,3-butadiene	210 U	200 U	190 U	200 U	190 U
Hexachlorobenzene	210 U	200 U	190 U	200 U	190 U
Hexachlorocyclopentadiene	210 U	200 U	190 R	200 U	190 U
Hexachloroethane	210 U	200 U	190 U	200 U	190 U
Hexachloropropene	210 UJ	200 UJ	190 UJ	200 UJ	190 UJ
Isophorone	210 U	200 U	190 U	200 U	190 U
Isosafrole	210 U	200 U	190 U	200 U	190 U
Methapyrilene	210 R	200 R	190 R	200 R	190 R
Methyl Methane Sulfonate	210 U	200 U	190 U	200 U	190 U
Nitrobenzene	210 U	200 U	190 U	200 U	190 U
n-Nitrosodiethylamine	210 U	200 U	190 U	200 U	190 U
n-Nitrosodimethylamine (NDMA)	210 U	200 U	190 U	200 U	190 U
n-Nitroso-di-n-butylamine	210 U	200 U	190 U	200 U	190 U
n-Nitrosodi-n-propylamine	210 U	200 U	190 U	200 U	190 U
n-Nitrosodiphenylamine	210 U	200 U	190 U	200 U	190 U
n-Nitrosomethylethylamine	210 U	200 U	190 U	200 U	190 U
n-Nitrosomorpholine	210 U	200 U	190 U	200 U	190 U
n-Nitrosopiperidine	210 U	200 U	190 U	200 U	190 U
n-Nitrosopyrrolidine	210 U	200 U	190 U	200 U	190 U
o-Toluidine	210 U	200 U	190 U	200 U	190 U
Pentachlorobenzene	210 U	200 U	190 U	200 U	190 U
Pentachloronitrobenzene	210 U	200 U	190 U	200 U	190 U
Pentachlorophenol	400 U	390 U	370 U	400 U	360 U
Phenacetin	210 U	200 U	190 U	200 U	190 U
Phenol	400 U	390 U	370 U	400 U	360 U
Pronamide	400 U	390 U	370 U	400 U	360 U
Pyridine	210 UJ	200 UJ	190 U	200 UJ	190 UJ
Safrole	210 U	200 U	190 U	200 U	190 U

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB03	75SB03	75SB04	75SB04	75SB05
Sample ID	75SB03-01	75SB03-04	75SB04-01	75SB04-04	75SB05-01
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0	1.0-3.0
PAHs (µg/kg)					
2-Methylnaphthalene	10 U	9.9 U	9.3 U	10 U	9.1 U
Acenaphthene	10 U	9.9 U	9.3 U	10 U	9.1 U
Acenaphthylene	10 U	1.6 J	5.1 J	13	14
Anthracene	10 U	9.9 U	9.3 U	14	18
Benzo(a)anthracene	10 UJ	9.9 UJ	9.3 UJ	20 J	68 J
Benzo(a)pyrene (BaP)	10 U	4.9 J	13	45	83
Benzo(b)fluoranthene	10 UJ	5.5 J	14 J	24 J	41 J
Benzo(g,h,i)perylene	10 U	6.1 J	19 J	31 J	49 J
Benzo(k)fluoranthene	10 UJ	5.3 J	7.8 J	37 J	71 J
Chrysene	10 U	3.9 J	5.5 J	18	54
Dibenz(a,h)anthracene	10 U	0.96 J	4 J	10 U	16 J
Fluoranthene	10 U	3.4 J	3.9 J	5.2 J	58
Fluorene	10 U	9.9 U	9.3 U	10 U	9.1 U
Indeno(1,2,3-cd)pyrene	10 UJ	8.3 J	23 J	45 J	70 J
Naphthalene	10 U	9.9 U	9.3 U	10 U	9.1 U
Phenanthrene	10 U	9.9 U	9.3 U	10 U	9.1 U
Pyrene	10 U	9.9 U	9.3 U	10 U	67
PAH totals (µg/kg)					
Low molecular weight PAHs	80	64.4	64.8	82.2	135.5
High molecular weight PAHs	90	54.76	104.9	240	519
TPH (mg/kg)					
Diesel Range Organics (DRO)	12 U	12 U	11 U	12 U	11 U
Gasoline Range Organics (GRO)	0.61 UJ	0.6 UJ	0.56 UJ	0.6 UJ	0.55 UJ
Total TPH	12 U	12 U	11 U	12 U	11 U

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	75SB03	75SB03	75SB04	75SB04	75SB05
Sample ID	75SB03-01	75SB03-04	75SB04-01	75SB04-04	75SB05-01
Sample Date	3/29/2010	3/29/2010	3/29/2010	3/29/2010	3/29/2010
Sample Depth (ft bgs)	1.0-3.0	7.0-9.0	1.0-3.0	7.0-9.0	1.0-3.0
Inorganics (mg/kg)					
Antimony	1.2 UJ	1.2 UJ	0.52 J	1.2 UJ	1.1 UJ
Arsenic	2.8 J	4.2 J	13.3 J	2.3 J	2 J
Barium	8.8	8	13.1	8.7	22.8
Beryllium	0.59 U	0.59 U	0.56 U	0.58 U	0.55 U
Cadmium	0.069 J	0.052 J	0.12 J	0.055 J	0.046 J
Chromium	6.9	7.5	18.6	2.6	4.6
Cobalt	1.4	2.3	3.4	0.64	1.5
Copper	4.7	4.6	13.8	1.9	6.9
Lead	0.95	0.68	3.2	0.4 J	3.2
Mercury	0.04 U	0.039 U	0.037 U	0.04 U	0.036 U
Nickel	5.3	5.5	8.2	4.8	3.7
Selenium	0.47 J	0.34 J	0.89 J	0.35 J	0.28 J
Silver	0.11 J	0.06 J	0.56 U	0.075 J	0.076 J
Thallium	0.06 J	0.049 J	0.13 J	0.034 J	0.032 J
Tin	5.9 U	5.9 U	5.6 U	5.8 U	5.5 U
Vanadium	11.1 J	27.6 J	43.7 J	3.5 J	12.4 J
Zinc	4	4.2	13.8	1.6 J	6.6

Notes:

ft bgs - feet below ground surface
µg/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
NA - Not Analyzed

U - Not detected
UJ - Reported quantitation limit is quali
J - Analyte present - Reported value is e
R - Result is rejected and unusable

QUALITY ASSURANCE/QUALITY CONTROL DATA

APPENDIX C

SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID	75ER01	75FB01	75TB01
Sample Date	3/29/2010	3/29/2010	3/29/2010
Volatiles (µg/L)			
1,1,1,2-Tetrachloroethane	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane (DBCP)	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (EDB)	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	0.5 U	0.5 U	0.5 U
1,2-Dichloroethene (trans)	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	0.5 U	0.5 U	0.5 U
1,3-Dichloropropene (cis)	0.5 U	0.5 U	0.5 U
1,3-Dichloropropene (trans)	0.5 U	0.5 U	0.5 U
1,4-Dichloro-2-butene (trans)	2 U	2 U	2 U
1,4-Dioxane (p-)	25 R	25 R	25 R
2-Butanone (MEK)	1.7 J	1.6 J	2.5 R
2-Chloro-1,3-butadiene (Chloroprene)	0.5 U	0.5 U	0.5 U
2-Hexanone (MBK)	2.5 U	2.5 U	2.5 U
3-Chloropropene (Allyl Chloride)	0.5 U	0.5 U	0.5 U
4-Methyl-2-pentanone (MIBK)	2.5 U	2.5 U	2.5 U
Acetone	2.9 J	3 J	1.2 J
Acetonitrile	0.5 U	0.5 U	0.5 U
Acrolein	5 U	5 U	5 U
Acrylonitrile	5 R	5 R	5 R
Benzene	0.044 J	0.053 J	0.5 U
Bromodichloromethane	0.5 U	0.5 U	0.5 U
Bromoform	0.5 U	0.5 U	0.5 U
Bromomethane	0.5 U	0.5 U	0.5 U
Carbon Disulfide	0.5 U	0.5 U	0.5 U
Carbon Tetrachloride	0.5 U	0.5 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U
Chloroethane	0.5 U	0.5 U	0.5 U
Chloroform	0.26 J	0.31 J	0.5 U
Chloromethane	0.5 U	0.5 U	0.5 U
Dibromochloromethane	0.5 U	0.5 U	0.5 U
Dibromomethane	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U
Ethyl Methacrylate	5 U	5 U	5 U
Ethylbenzene	0.045 J	0.056 J	0.5 U
Isobutyl Alcohol	25 R	25 R	25 R
Methyl Acrylonitrile	5 U	5 U	5 U
Methyl Iodide	0.5 U	0.5 U	0.5 U
Methyl Methacrylate	5 U	5 U	5 U

APPENDIX C

SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID	75ER01	75FB01	75TB01
Sample Date	3/29/2010	3/29/2010	3/29/2010
Volatiles (µg/L) (Cont)			
Methylene Chloride	5.1	5.7	0.062 J
Pentachloroethane	0.5 U	0.5 U	0.5 U
Propionitrile (Ethyl Cyanide)	25 U	25 U	25 U
Styrene (Ethenylbenzene)	0.5 U	0.5 U	0.5 U
Tetrachloroethene (PCE)	0.5 U	0.5 U	0.5 U
Toluene	1.9	2.1	0.076 J
Trichloroethene (TCE)	0.5 U	0.5 U	0.5 U
Xylene, m/p-	0.17 J	0.19 J	1 U
Xylene, o-	0.5 U	0.1 J	0.5 U
Semivolatiles (µg/L)			
1,2,4,5-Tetrachlorobenzene	5 U	5 U	NA
1,2,4-Trichlorobenzene	5 U	5 U	NA
1,2-Dichlorobenzene (o-)	5 U	5 U	NA
1,3,5-Trinitrobenzene (TNB)	5 U	5 U	NA
1,3-Dichlorobenzene (m-)	5 U	5 U	NA
1,3-Dinitrobenzene (m-)	5 U	5 U	NA
1,4-Dichlorobenzene (p-)	5 U	5 U	NA
1,4-Naphthoquinone	5 U	5 U	NA
1,4-Phenylenediamine	51 R	51 R	NA
1-Naphthylamine	5 UJ	5 UJ	NA
2,2'-Oxybis[1-chloropropane]	5 U	5 U	NA
2,3,4,6-Tetrachlorophenol	10 U	10 U	NA
2,4,5-Trichlorophenol	10 U	10 U	NA
2,4,6-Trichlorophenol	10 U	10 U	NA
2,4-Dichlorophenol	10 U	10 U	NA
2,4-Dimethylphenol	10 U	10 U	NA
2,4-Dinitrophenol	10 U	10 U	NA
2,4-Dinitrotoluene (DNT)	5 U	5 U	NA
2,6-Dichlorophenol	10 U	10 U	NA
2,6-Dinitrotoluene (DNT)	5 U	5 U	NA
2-Acetylaminofluorene	5 UJ	5 UJ	NA
2-Chloronaphthalene	5 UJ	5 UJ	NA
2-Chlorophenol	10 U	10 U	NA
2-Methyl-5-nitroaniline	5 UJ	5 UJ	NA
2-Methylphenol (o-Cresol)	10 U	10 U	NA
2-Naphthylamine	5 UJ	5 UJ	NA
2-Nitroaniline	5 U	5 U	NA
2-Nitrophenol	10 U	10 U	NA
2-Picoline	5 UJ	5 UJ	NA
3,3'-Dichlorobenzidine	5 U	5 U	NA
3,3'-Dimethylbenzidine	5 UJ	5 UJ	NA
3-Methylcholanthrene	5 U	5 U	NA
3-Methylphenol (m-Cresol)	8 U	8 U	NA
3-Nitroaniline	5 U	5 U	NA

APPENDIX C

SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID	75ER01	75FB01	75TB01
Sample Date	3/29/2010	3/29/2010	3/29/2010
Semivolatiles (µg/L) (Cont)			
4,6-Dinitro-2-methylphenol	10 U	10 U	NA
4-Aminobiphenyl	5 UJ	5 UJ	NA
4-Bromophenyl-phenylether	5 U	5 U	NA
4-Chloro-3-methylphenol	10 U	10 U	NA
4-Chloroaniline	5 U	5 U	NA
4-Chlorophenyl-phenylether	5 U	5 U	NA
4-Dimethylaminoazobenzene (p-)	5 UJ	5 UJ	NA
4-Methylphenol (p-Cresol)	8 U	8 U	NA
4-Nitroaniline	5 U	5 U	NA
4-Nitrophenol	10 U	10 U	NA
4-Nitroquinoline-1-oxide	5 UJ	5 UJ	NA
7,12-Dimethylbenz(a)anthracene	5 U	5 U	NA
Acetophenone	5 U	5 U	NA
Aniline	5 U	5 U	NA
Aramite	5 U	5 U	NA
Benzyl Alcohol	5 U	5 U	NA
Bis(2-chloroethoxy)methane	5 U	5 U	NA
Bis(2-chloroethyl)ether	5 U	5 U	NA
Bis(2-ethylhexyl) Phthalate (BEHP)	5 U	5 U	NA
Butyl Benzyl Phthalate	5 U	5 U	NA
Diallate (cis)	5 U	5 U	NA
Diallate (total)	5 UJ	5 UJ	NA
Diallate (trans)	5 UJ	5 UJ	NA
Dibenzofuran	5 U	5 U	NA
Diethyl Phthalate (DEP)	5 U	5 U	NA
Dimethyl Phthalate	5 U	5 U	NA
Di-n-butyl Phthalate (DBP)	5 U	5 U	NA
Di-n-octyl Phthalate	5 U	5 U	NA
Dinoseb	5 U	5 U	NA
Ethyl Methane Sulfonate (EMS)	5 U	5 U	NA
Hexachloro-1,3-butadiene	5 U	5 U	NA
Hexachlorobenzene	5 U	5 U	NA
Hexachlorocyclopentadiene	5 U	5 U	NA
Hexachloroethane	5 U	5 U	NA
Hexachloropropene	5 U	5 U	NA
Isophorone	5 U	5 U	NA
Isosafrole	5 U	5 U	NA
Methapyrilene	5 UJ	5 UJ	NA
Methyl Methane Sulfonate	5 U	5 U	NA
Nitrobenzene	5 U	5 U	NA

APPENDIX C

SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID	75ER01	75FB01	75TB01
Sample Date	3/29/2010	3/29/2010	3/29/2010
Semivolatiles (µg/L) (Cont)			
n-Nitrosodiethylamine	5 UJ	5 UJ	NA
n-Nitrosodimethylamine (NDMA)	5 U	5 U	NA
n-Nitroso-di-n-butylamine	5 UJ	5 UJ	NA
n-Nitrosodi-n-propylamine	5 U	5 U	NA
n-Nitrosodiphenylamine	5 UJ	5 UJ	NA
n-Nitrosomethylethylamine	5 U	5 U	NA
n-Nitrosomorpholine	5 UJ	5 UJ	NA
n-Nitrosopiperidine	5 UJ	5 UJ	NA
n-Nitrosopyrrolidine	5 UJ	5 UJ	NA
o-Toluidine	5 UJ	5 UJ	NA
Pentachlorobenzene	5 U	5 U	NA
Pentachloronitrobenzene	5 U	5 U	NA
Pentachlorophenol	10 U	10 U	NA
Phenacetin	5 U	5 U	NA
Phenol	10 U	10 U	NA
Pronamide	10 U	10 U	NA
Pyridine	5 U	5 U	NA
Safrole	5 U	5 U	NA
PAHs (µg/L)			
2-Methylnaphthalene	0.2 U	0.2 U	NA
Acenaphthene	0.2 U	0.2 U	NA
Acenaphthylene	0.2 U	0.2 U	NA
Anthracene	0.2 U	0.2 U	NA
Benzo(a)anthracene	0.2 U	0.2 U	NA
Benzo(a)pyrene (BaP)	0.2 U	0.2 U	NA
Benzo(b)fluoranthene	0.2 U	0.2 U	NA
Benzo(g,h,i)perylene	0.2 U	0.2 U	NA
Benzo(k)fluoranthene	0.2 U	0.2 U	NA
Chrysene	0.2 U	0.2 U	NA
Dibenz(a,h)anthracene	0.2 U	0.2 U	NA
Fluoranthene	0.2 U	0.2 U	NA
Fluorene	0.2 U	0.2 U	NA
Indeno(1,2,3-cd)pyrene	0.2 U	0.2 U	NA
Naphthalene	0.084 J	0.085 J	NA
Phenanthrene	0.2 U	0.2 U	NA
Pyrene	0.2 U	0.2 U	NA
PAH totals (µg/L)			
Low molecular weight PAHs	1.484	1.485	NA
High molecular weight PAHs	1.8	1.8	NA

APPENDIX C

SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 75 – BUILDING 803
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID	75ER01	75FB01	75TB01
Sample Date	3/29/2010	3/29/2010	3/29/2010
TPH (mg/L)			
Diesel Range Organics (DRO)	0.54 U	0.53 U	NA
Gasoline Range Organics (GRO)	0.033 J	0.04 J	0.034 J
Total TPH	0.573 J	0.57 J	0.034 J
Total Inorganics (µg/L)			
Antimony	2 U	2 U	NA
Arsenic	1 U	1 U	NA
Barium	10 U	10 U	NA
Beryllium	1 U	1 U	NA
Cadmium	1 U	1 U	NA
Chromium	2 U	2 U	NA
Cobalt	1 U	1 U	NA
Copper	2 U	2 U	NA
Lead	1 U	1 U	NA
Manganese	1 U	1 U	NA
Mercury	0.2 U	0.2 U	NA
Nickel	1 U	1 U	NA
Selenium	5 U	5 U	NA
Silver	1 U	1 U	NA
Thallium	1 U	1 U	NA
Tin	20 U	20 U	NA
Vanadium	5 U	5 U	NA
Zinc	2 U	2 U	NA

Notes:

µg/L - micrograms per liter
mg/L - milligrams per liter

U - Not detected
UJ - Reported quantitation limit is qualified as estimated
J - Analyte present - Reported value is estimated
R - Result is rejected and unusable

APPENDIX D
PHASE I RFI DATA VALIDATION SUMMARIES

DataQual

Environmental Services, LLC

Michael Baker, Jr., Inc.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108

June 24, 2010
SDG# 1003251, CompuChem
NAPR SWMU 75, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1003251. 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, January 2006- SOP #HW-24 and 8270D-Rev 3, October 2006-SOP #HW-22,) and professional judgment. Region II has not developed a validation checklist SOP for the methods used to assess the organic methods for hydrocarbons and inorganic methods in this SDG (SW-846 methods 8015_DRO, 8015_GRO, and 6020B, 6010B and 7470A). Therefore, alternative worksheets were provided. Region II flagging conventions were used. All areas of concern are discussed in the body of the report and a summary of data qualification is provided.

Sample ID	Lab ID	Matrix	VOA App IX	SVOA App IX w/ LL PAH	GRO	DRO	Metals	Tin
75FB01	1003251-01	water	X	X	X	X	X	X
75ER01	1003251-02	water	X	X	X	X	X	X
75TB01	1003251-03	water	X		X			

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition *
- Technical Holding Times *
- GC/MS Tuning *
- ICP Tuning *
- GC Performance *
- Initial/Continuing Calibrations
- ICSA/ICSAB Standards *
- CRDL Standards *
- Blanks *
- Internal Standards *
- Surrogate Recoveries *
- Laboratory Control Samples
- Matrix Spike Recoveries NA

- Matrix Duplicate RPDs NA
- Serial Dilutions *
- Field Duplicates NA
- 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.

VOA

The initial calibration exhibited some compounds with low RRF values, which resulted in qualifying non-detected values as rejected for these compounds.

SVOA

Due to high %RSDs and %D values, in the initial and continuing calibrations, some compounds were qualified as estimated.

Due to recoveries below 10% for LCS samples, the associated sample non-detect results were qualified as rejected for one or more compounds.

GRO

No qualifications to the data were required.

DRO

No qualifications to the data were required.

App IX Metals by 6020/7470A

No qualifications to the data were required.

Tin by 6010B

No qualifications to the data were required.

Specific Evaluation of Data

Data Completeness

The data package was received complete and intact. Resubmissions were required. The metals results were initially reported as non-detect at the MDL but the project required the reporting of non-detect results to the RL. All metals forms were resubmitted.

Technical Holding Times

According to chain of custody records, sampling was performed on 3/29/10 and samples were received at the laboratory 3/30/10. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

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 are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC 4/06/10	acetone acrylonitrile 2-butanone isobutyl alcohol 1,4-dioxane	0.029 0.036 0.045 0.003 0.0006	all samples	J/R

SVOA

Calibration standards exhibited %RSDs and %D values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC full scan 3/17/10	2-picoline	22.651	all samples	J/UJ
	n-nitrosodiethylamine	21.768		
	n-nitrosopyrrolidine	24.941		
	n-nitrosomorpholine	22.939		
	o-toluidine	22.524		
	n-nitrosopiperidine	24.199		
	p-phenylenediamine	28.824		
	1-naphthylamine	27.268		
	2-naphthylamine	30.303		
	5-nitro-o-toluidine	27.604		
	n-nitrosodiphenylamine	16.397		
	diallate (trans isomer)	23.234		
	4-aminobiphenyl	24.870		
	4-nitroquinoline-1-oxide	19.692		
	methapyrilene	29.063		
	p-dimethylaminoazobenzene	25.398		
	3,3'-dimethylbenzidine	29.792		
	2-acetylaminofluorene	24.074		
	indeno(1,2,3-cd)pyrene	19.789		
	diallate (total)	19.303		
CC-full scan 4/20610	n-nitroso-di-n-butylamine	-39.22	all samples	J/UJ
	2-chloronaphthalene	-37.60		
	dibenzo(a,h)anthracene	24.08		
	benzo(g,h,i)perylene	28.35		

Laboratory Control Sample

SVOA

The submitted LCS exhibited non-compliant recoveries requiring qualification or rejection in the field samples. A summary of these non-compliances and affected samples are noted in the following table.

LCS	Sample IDs	Compounds	%Recovery	QC Limit	Q Flag
SRLLCS	all samples	p-phenylenediamine	0	20-150	J/R

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
all samples	acetone acrylonitrile 2-butanone isobutyl alcohol 1,4-dioxane	+/-	J/R

SVOA

Sample ID	Compound	Results	Q flag
all samples	2-picoline n-nitrosodiethylamine n-nitrosopyrrolidine n-nitrosomorpholine o-toluidine n-nitrosopiperidine p-phenylenediamine 1-naphthylamine 2-naphthylamine 5-nitro-o-toluidine n-nitrosodiphenylamine diallate (trans isomer) 4-aminobiphenyl 4-nitroquinoline-1-oxide methapyrilene p-dimethylaminoazobenzene 3,3'-dimethylbenzidine 2-acetylaminofluorene indeno(1,2,3-cd)pyrene diallate (total)	+/-	J/UJ
all samples	n-nitroso-di-n-butylamine 2-chloronaphthalene dibenzo(a,h)anthracene benzo(g,h,i)perylene	+/-	J/UJ
all samples	p-phenylenediamine	+/-	J/R

GRO

Sample ID	Compound	Results	Q flag
No qualifications required.			

Summary of Data Qualifications

DRO

Sample ID	Compound	Results	Q flag
No qualifications required.			

App IX Metals

Sample ID	Analyte	Results	Q flag
No qualifications required.			

Tin

Sample ID	Analyte	Results	Q flag
No qualifications required.			

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

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

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL 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 RL, result is reported as non-detect at the reported concentration, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

R -	Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
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 RL.
J/UJ -	Sample result is less than 10X RL when blank result is below the negative RL.

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 RL 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 RL, result is reported as non-detect at the reported concentration, when the FB result is less or greater than the RL.
R -	Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.
J -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

General Abbreviations

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

COMPUCHEM SDG 1003252

DataQual

Environmental Services, LLC

Michael Baker, Jr., Inc.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108

June 24, 2010
SDG# 1003252, CompuChem
NAPR SWMU 75, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1003252. 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, January 2006- SOP #HW-24 and 8270D-Rev 3, October 2006-SOP #HW-22) and professional judgment. Region II has not developed a validation checklist SOP for the methods used to assess the organic methods for hydrocarbons and inorganic methods in this SDG (SW-846 methods 8015_DRO, 8015_GRO, 6010B, 6020B and 7471A). Therefore, alternative worksheets were provided. Region II flagging conventions were used. All areas of concern are discussed in the body of the report and a summary of data qualification is provided.

Sample ID	Lab ID	Matrix	VOA App IX	SVOA App IX w/ LL PAH	GRO	DRO	Metals	Tin
75SB01-00	1003252-01	soil	X	X	X	X	X	X
75SB01-01	1003252-02	soil	X	X	X	X	X	X
75SB01-01D	1003252-03	soil	X	X	X	X	X	X
75SB01-04	1003252-04	soil	X	X	X	X	X	X
75SB02-00	1003252-05	soil	X	X	X	X	X	X
75SB02-01	1003252-06	soil	X	X	X	X	X	X
75SB02-04	1003252-07	soil	X	X	X	X	X	X
75SB03-00	1003252-08	soil	X	X	X	X	X	X
75SB03-01	1003252-09	soil	X	X	X	X	X	X
75SB03-04	1003252-10	soil	X	X	X	X	X	X
75SB04-00	1003252-11	soil	X	X	X	X	X	X
75SB04-00D	1003252-12	soil	X	X	X	X	X	X
75SB04-01	1003252-13	soil	X	X	X	X	X	X
75SB04-04	1003252-14	soil	X	X	X	X	X	X
75SB05-00	1003252-15	soil	X	X	X	X	X	X
75SB05-01	1003252-16	soil	X	X	X	X	X	X
75SB04-01 MS	1003252-13MS	soil	X	X	X	X	X	X
75SB04-01 MSD	1003252-13MSD	soil	X	X	X	X	X	X

The following quality control samples were provided with this SDG: sample 75SB01-01D-field duplicate of sample 75SB01-01; and sample 75SB04-00D -field duplicate of sample 75SB04-00.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition
- Technical Holding Times *
- GC/MS Tuning *
- ICP Tuning *
- GC Performance *
- Initial/Continuing Calibrations
- ICSA/ICSAB Standards *
- CRDL 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.

VOA

The initial and continuing calibrations exhibited some compounds with low RRF values, which resulted in qualifying non-detected values as rejected for these compounds. Due to high %D values, in the continuing calibrations, some compounds were qualified as estimated.

Blank contamination was noted in the method and/or QC blanks associated with samples in this batch. Qualifications were added to the data.

SVOA

Due to high %RSDs and %D values, in the initial and continuing calibrations, some compounds were qualified as estimated. The continuing calibrations exhibited some compounds with low RRF values, which resulted in qualifying non-detected values as rejected for these compounds.

Blank contamination was noted in the method and/or QC blanks associated with samples in this batch. Qualifications were added to the data.

Due to below 10% recoveries for LCS samples, the associated sample non-detect results were qualified as rejected for one or more compounds. Non-compliant recoveries were also exhibited that required some compound results to be qualified as estimated.

The matrix spike and matrix spike duplicate exhibited below 10% recoveries that resulted in qualifying two compound results as rejected in the associated sample.

The two field duplicate pairs did not exhibit comparable results; therefore several results were qualified as estimated.

Dilutions were required for two samples to obtain results within the calibration range.

Two compound results, for one sample, were qualified as tentatively identified with approximate concentration as the laboratory could not resolve the compounds chromatographically.

GRO

Soil samples were collected in unpreserved 4-oz jars and analyzed on days 10 and 11; therefore results were qualified as estimated and considered biased low.

Qualifications were added to the data due to method blank contamination.

DRO

Qualifications were added to the data due to method blank contamination.

App IX Metals by 6020/7471A

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

The matrix spikes pair submitted in this SDG exhibited non-compliant recoveries in both the MS and the MSD for one analyte for which qualifications were required.

The matrix duplicate submitted in this SDG exhibited non-compliant %RPDs >35% for arsenic and vanadium. All results for these analytes were qualified as estimated J/UJ in the metals samples.

The serial dilution submitted in this SDG exhibited a non-compliant %D for the analyte vanadium. All results for vanadium in the metals samples were qualified as estimated J/UJ.

The field duplicate pair of sample 75SB01-01/75SB01-01D exhibited one analyte with a non-compliant absolute difference results. This analyte was flagged based on Region II guidance in the field duplicate pair only.

All results reported at concentrations between the method detection limit and the reporting limits (B flagged by the laboratory) were qualified as estimated J.

Tin by 6010B

No qualifications to the data were required.

Specific Evaluation of Data

Data Completeness

The data package was received complete and intact. Resubmissions were required. The metals results were initially reported as non-detect at the MDL but the project required the reporting of non-detect results to the RL. All metals forms were resubmitted.

Sample Condition

GRO

Soil samples were collected in unpreserved 4-oz jars and were analyzed on days 10 and 11; therefore results were qualified as estimated (J/UJ). Sample analysis exceeded the 7-day holding time requirement per method and SW 846 Chapter Four section 4.1; however analysis was within 14 days and therefore results were qualified as estimated and should be considered biased low.

Technical Holding Times

According to chain of custody records, sampling was performed on 3/29/10 and samples were received at the laboratory 3/31/10. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

Initial/Continuing Calibration

VOA

Calibration standards exhibited %Ds and RRF values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC 3/30/10	acrolein acrylonitrile propionitrile isobutyl alcohol 1,4-dioxane methylmethacrylate	0.028 0.046 0.018 0.006 0.002 0.049	all samples	J/R
	1,2-dichloropropane	16.913		J/UJ
CC 4/1/10	acetone	0.048	all samples	J/R
	chloromethane	24.14		J/UJ

SVOA

Calibration standards exhibited %RSDs and %D values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC full scan 4/16/10	benzyl alcohol hexachloropropene 1,4-napthoquinone diallate (trans isomer) 4-nitroquinoline-1-oxide 7,12-dimethylbenz(a)anthracene benzo(k)fluoranthene	15.016 21.849 20.128 19.278 23.521 16.318 29.966	all samples	J/UJ
CC-full scan 4/25/10	2,6-dichlorophenol p-phenylenediamine	20.12 38.30	75SB04-01, 75SB01-00, 75SB01-01, 75SB01-04	J/UJ
CC-full scan 4/26/10	pyridine aniline p-phenylenediamine 2-acetylaminofluorene aramite	22.35 24.62 -32.35 22.03 21.63	75SB02-00, 75SB02-01, 75SB02-04, 75SB03-00, 75SB03-01, 75SB03-04, 75SB01-01D, 75SB04-04, 75SB05-00, 75SB05-01	J/UJ
CC-full scan 4/26/10	p-phenylenediamine 1-naphthylamine methapyrilene	-42.07 -20.11 -29.90	75SB04-00	J/UJ
CC-full scan 5/03/10	aniline 4-chloroaniline p-phenylenediamine dinoseb	20.39 -23.66 -48.20 25.90	75SB04-00DRE	J/UJ
IC-SIM 4/26/10/10	indeno(1,2,3-cd)pyrene	15.549	all samples	J/UJ

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
CC-SIM 4/29/10	benzo(a)anthracene benzo(b)fluoranthene benzo(k)fluoranthene	21.29 -21.29 -43.04	75SB04-01, 75SB01-01, 75SB01-04, 75SB02-00, 75SB02-01, 75SB03-01, 75SB03-04, 75SB04-00, 75SB04-04, 75SB05-00, 75SB05-01	J/UJ
CC-SIM 4/30/10	benzo(a)anthracene dibenz(a,h)anthracene	23.88 24.83	75SB02-04, 75SB01-00, 75SB03-00	J/UJ
CC-SIM 5/01/10	2-methylnaphthalene chrysene	-24.00 -22.24	75SB04-00DRE	J/UJ

Blanks

VOA

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

Blank ID	Compound	Concentration	Reporting Limit	Action Level
VBLKSI	acetone	6.6J ug/Kg	13 ug/Kg	2X RL

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

Sample ID	Compound	Q Flag
75SB01-01, 75SB01-01D, 75SB04-00, 75SB04-00D, 75SB04-01	acetone	U

SVOA

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

Blank ID	Compound	Concentration	Reporting Limit
SBLKRU	di-n-butylphthalate	26J ug/Kg	170 ug/Kg
SBLKRU-SIM	naphthalene	1.7J	8.3
	2-methylnaphthalene	1.2J	8.3
	acenaphthene	0.66J	8.3
	fluorene	0.74J	8.3
	phenanthrene	1.5J	8.3
	anthracene	0.58J	8.3
	pyrene	0.57J	8.3
	benzo(a)anthracene	0.68J	8.3
75ER01-SIM	naphthalene	0.084J ug/L	0.20 ug/L
75FB01	naphthalene	0.085J ug/L	0.20 ug/L

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

Sample ID	Compound	Q Flag
75SB01-00, 7SSB01-01	di-n-butylphthalate	U at RL
PAH SIM: 75SB01-00, 75SB01-01, 75SB02-04, 75SB03-00, 75SB04-00, 75SB04-01, 75SB04-04, 75SB05-00, 75SB05-01	naphthalene	U at RL
PAH SIM: 75SB01-00, 75SB01-01, 75SB02-04, 75SB03-00, 75SB04-00, 75SB05-00	2-methylnaphthalene	U at RL
PAH SIM: 75SB01-01, 75SB02-00, 75SB02-01, 75SB02-04, 75SB03-00, 75SB05-00, 75SB05-01	acenaphthene	U at RL

Sample ID	Compound	Q Flag
PAH SIM: 75SB01-01, 75SB02-00, 75SB02-01, 75SB02-04, 75SB03-00, 75SB04-00, 75SB04-04, 75SB05-00, 75SB05-01	fluorene	U at RL
PAH SIM: 75SB01-01, 75SB02-00, 75SB02-04, 75SB04-00, 75SB04-01, 75SB04-04, 75SB05-01	phenanthrene	U at RL
PAH SIM: 75SB01-04, 75SB02-00, 75SB02-04, 75SB03-04, 75SB04-00, 75SB04-01	anthracene	U at RL
PAH SIM: 75SB02-00, 75SB02-04, 75SB03-04, 75SB04-01, 75SB04-04	pyrene	U at RL
PAH SIM: 75SB02-00, 75SB02-04, 75SB03-04, 75SB04-00, 75SB04-01	benzo(a)anthracene	U at RL

GRO

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

Blank ID	Compound	Concentration	RL	Action Level
VBLKDI	GRO	0.044J mg/Kg	0.5 mg/Kg	RL
VBLKDK	GRO	0.04J	0.5	RL

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

Sample ID	Compound	Q Flag
all samples	GRO	U at RL

DRO

The associated instrument blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table, see worksheets for full list of compounds.

Blank ID	Compound	Concentration	Action Level	Q Flag
PIBLKXR	DRO	0.30J mg/L	RL	U at RL
PIBLKXS	DRO	0.027J mg/L	RL	U at RL
PIBLKXT	DRO	0.068J mg/L	RL	U at RL
PIBLKXU	DRO	0.13J mg/L	RL	U at RL
PIBLKXV	DRO	0.45J mg/L	RL	U at RL

Appendix IX Metals by 6020/7471B

Associated blanks exhibited contamination as noted in the following table. Please see the Glossary of Qualification Flags and Abbreviations for details.

Blank ID	Analyte	Concentration	Action Level	Q Flag
ICB Run #2	antimony	0.250J ug/L	RL	U at RL

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

Sample ID	Analyte	Q Flag
all samples >MDL ≤ RL except 75-SB04-01	antimony	U at RL

Tin by 6010B

Associated blanks exhibited contamination as noted in the following table. Please see the Glossary of Qualification Flags and Abbreviations for details.

Blank ID	Analyte	Concentration	Action Level	Q Flag
PBS	tin	1.667B mg/Kg	RL	U at RL

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

Sample ID	Analyte	Q Flag
all samples >MDL ≤ RL	tin	U at RL

Laboratory Control Sample

SVOA

The submitted LCS exhibited non-compliant recoveries requiring qualification or rejection in the field samples. A summary of these non-compliances and affected samples are noted in the following table.

LCS	Sample IDs	Compounds	%Recovery	QC Limit	Q Flag
SRULCS full scan	all samples (initial analysis)	2,4-dichlorophenol	38	42-119	J/UJ
		p-phenylenediamine	0	20-150	J/R
		methapyrilene	6	20-150	
SRVLCS SIM	all samples (initial analysis)	benzo(b)fluoranthene	117	45-115	J
		benzo(k)fluoranthene	150	45-125	
		indeno(1,2,3-cd)pyrene	170	40-125	
		dibenzo(a,h)anthracene	159	40-125	
		benzo(g,h,i)perylene	133	40-125	
SXVLCS	75SB04-00DRE	p-phenylenediamine	0	20-150	J/R
SXWLCS SIM	75SB04-00DRE	indeno(1,2,3)pyrene	127	40-125	J

Matrix Spike

SVOA

The matrix spike and matrix spike duplicate associated with sample 75SB04-01 exhibited zero or below 10% recoveries for p-phenylenediamine and hexachlorocyclopentadiene; therefore the non-detect result for these compounds were qualified as rejected (R).

Appendix IX Metals by 6020/7471B

The matrix spike analysis submitted in this SDG exhibited non-compliant %Rs for three analytes, requiring qualification or rejection in the field samples. A summary of these non-compliances and affected samples are noted in the following table.

MS/MSD	Analytes	Samples	%R	Q Flag
75SB04-01	antimony	all samples	61/65	J/UJ

Matrix Duplicates

Appendix IX Metals by 6020/7471B

The matrix duplicate analysis submitted in this SDG exhibited a non-compliant RPDs >35% for two analytes, requiring qualification in the field samples. A summary of these non-compliances and affected samples are noted in the following table.

MD	Analytes	Samples	RPD	Q Flag
75-SB04-01	arsenic	all samples	45	J/UJ
	vanadium		38	

Serial Dilutions

Appendix IX Metals by 6020/7471B

The serial dilution analysis submitted in this SDG exhibited a non-compliant %D for one compound, requiring qualification in the field samples. A summary of this non-compliance and affected samples are noted in the following table.

SD	Analytes	Samples	%D	Q Flag
75SB04-01	vanadium	all samples	14	J/UJ

Field Duplicates

SVOA

The field duplicate pairs listed in the table below exhibited non-comparable results and were qualified as stated.

Duplicate pair	Compound	% RPD	Q flag
75SB04-00 and 75SB04-00DRE	fluoranthene	112	J
	pyrene	123	
	chrysene	125	
	benzo(b)fluoranthene	105	
	benzo(k)fluoranthene	124	
	benzo(a)pyrene	117	
	indeno(1,2,3-cd)pyrene	200	
75SB01-01 and 75SB01D-01	benzo(b)fluoranthene	99	J
	benzo(k)fluoranthene	94	
	benzo(a)pyrene	102	

Appendix IX Metals by 6020/7471B

One of the field duplicate pairs exhibited non-compliant field duplicate reproducibility for one analyte. The field duplicate pair and analyte were flagged as noted in the table below based on Region II guidelines.

Sample ID	Analyte	RPD or Absolute Difference	Q Flag
57SB07-00/57SB07-00D	antimony	4.7	R

Identification/Quantitation

SVOA

Sample 75SB04-00D was not used in favor of the re-analysis, due to non-compliant surrogate recoveries.

Sample 75SB04-00RE was not used, in favor of the initial analysis, due to surrogate recoveries.

Sample 75SB01-00 (SIM) and 75SB03-00 (SIM) required a dilution to obtain results within the calibration. For these samples, the E-flagged results in the initial analyses were rejected in favor of the corresponding D-flagged results in the diluted analyses. The dilution of sample 75SB01-00 (SIM) exhibited results above the calibration range; therefore these results were qualified as estimated (J).

According to the case narrative, and raw data, benzo(b)fluoranthene and benzo(k)fluoranthene could not be chromatographically resolved for sample 75SB04-00. Therefore results for these compounds were flagged JN, indicating the presence of the compounds was tentatively identified and the associated numerical value represents its approximate concentration. This issue also occurred in the initial analysis of sample 75SB03-00; however in the diluted analysis, which is the run in which the results for these two compounds was used, these compounds were resolved. Therefore no qualifications were required for sample 75SB03-00.

Appendix IX Metals by 6020/7471B

All results reported at concentrations between the method detection limit and the reporting limit (B flagged by the laboratory) were qualified as estimated J.

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,

Laura Maschhoff
President

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag
all samples	acrolein acrylonitrile propionitrile isobutyl alcohol 1,4-dioxane methylmethacrylate	+/-	J/R
all samples	1,2-dichloropropane	+/-	J/UJ
all samples	acetone	+/-	J/R
all samples	chloromethane	+/-	J/UJ
75SB01-01, 75SB01-01D, 75SB04-00, 75SB04-00D, 75SB04-01	acetone	+	U

SVOA

Sample ID	Compound	Results	Q flag
all samples	benzyl alcohol hexachloropropene 1,4-napthoquinone diallate (trans isomer) 4-nitroquinoline-1-oxide 7,12-dimethylbenz(a)anthracene benzo(k)fluoranthene	+/-	J/UJ
75SB04-01, 75SB01-00, 75SB01-01, 75SB01-04	2,6-dichlorophenol p-phenylenediamine	+/-	J/UJ
75SB02-00, 75SB02-01, 75SB02-04, 75SB03-00, 75SB03-01, 75SB03-04, 75SB01-01D, 75SB04-04, 75SB05-00, 75SB05-01	pyridine aniline p-phenylenediamine 2-aceylaminofluorene aramite	+/-	J/UJ
75SB04-00	p-phenylenediamine 1-naphthylamine methapyrilene	+/-	J/UJ
75SB04-00DRE	aniline 4-chloroaniline p-phenylenediamine dinoseb	+/-	J/UJ
PAH SIM: all samples	indeno(1,2,3-cd)pyrene	+/-	J/UJ
PAH SIM: 75SB04-01, 75SB01-01, 75SB01-04, 75SB02-00, 75SB02-01, 75SB03-01, 75SB03-04, 75SB04-00, 75SB04-04, 75SB05-00, 75SB05-01	benzo(a)anthracene benzo(b)fluoranthene benzo(k)fluoranthene	+/-	J/UJ
PAH SIM: 75SB02-04, 75SB01-00, 75SB03-00	benzo(a)anthracene dibenz(a,h)anthracene	+/-	J/UJ
PAH SIM: 75SB04-00DRE	2-methylnaphthalene chrysene	+/-	J/UJ
75SB01-00, 7SSB01-01	di-n-butylphthalate	+	U at RL
PAH SIM: 75SB01-00, 75SB01-01, 75SB02-04, 75SB03-00, 75SB04-00, 75SB04-01, 75SB04-04, 75SB05-00, 75SB05-01	naphthalene	+	U at RL

Summary of Data Qualifications

SVOA, continued

Sample ID	Compound	Results	Q flag
PAH SIM: 75SB01-00, 75SB01-01, 75SB02-04, 75SB03-00, 75SB04-00, 75SB05-00	2-methylnaphthalene	+	U at RL
PAH SIM: 75SB01-01, 75SB02-00, 75SB02-01, 75SB02-04, 75SB03-00, 75SB05-00, 75SB05-01	acenaphthene	+	U at RL
PAH SIM: 75SB01-01, 75SB02-00, 75SB02-01, 75SB02-04, 75SB03-00, 75SB04-00, 75SB04-04, 75SB05-00, 75SB05-01	fluorene	+	U at RL
PAH SIM: 75SB01-01, 75SB02-00, 75SB02-04, 75SB04-00, 75SB04-01, 75SB04-04, 75SB05-01	phenanthrene	+	U at RL
PAH SIM: 75SB01-04, 75SB02-00, 75SB02-04, 75SB03-04, 75SB04-00, 75SB04-01	anthracene	+	U at RL
PAH SIM: 75SB02-00, 75SB02-04, 75SB03-04, 75SB04-01, 75SB04-04	pyrene	+	U at RL
PAH SIM: 75SB02-00, 75SB02-04, 75SB03-04, 75SB04-00, 75SB04-01	benzo(a)anthracene	+	U at RL
all samples (initial analysis)	2,4-dichlorophenol	+/-	J/UJ
all samples (initial analysis)	p-phenylenediamine methapyrilene	+/-	J/R
all samples (initial analysis) -SIM	benzo(b)fluoranthene benzo(k)fluoranthene indeno(1,2,3-cd)pyrene dibenzo(a,h)anthracene benzo(g,h,i)perylene	+	J
75SB04-00DRE	p-phenylenediamine	+/-	J/R
75SB04-00DRE -SIM	indeno(1,2,3)pyrene	+	J
75SB04-01	p-phenylenediamine hexachlorocyclopentadiene	-	R
75SB04-00 (SIM) and 75SB04-00DRE (SIM)	fluoranthene pyrene chrysene benzo(b)fluoranthene benzo(k)fluoranthene benzo(a)pyrene indeno(1,2,3-cd)pyrene	+	J
75SB01-01 and 75SB01D-01	benzo(b)fluoranthene benzo(k)fluoranthene benzo(a)pyrene	+	J
75SB04-00D, 75SB04-00RE	all results	+/-	R
75SB01-00 (SIM), 75SB03-00 (SIM)	all E-flagged compounds	+	R
75SB01-00DL (SIM), 75SB03-00DL (SIM)	all results except D-flagged compounds	+/-	R
75SB01-00DL (SIM)	all E-flagged results	+	J
75SB04-00	benzo(b)fluoranthene benzo(k)fluoranthene	+/-	JN

Summary of Data Qualifications

GRO

Sample ID	Compound	Results	Q flag
all soil samples	GRO	+/-	J/UJ
all samples	GRO	+	U at RL

DRO

Sample ID	Compound	Results	Q flag
all samples	DRO	+J	U at RL

Metals

Sample ID	Analyte	Results	Q flag
all samples >MDL ≤ RL except 75-SB04-01	antimony	+B	U at RL
all samples	antimony	+/-	J/UJ
all samples	arsenic vanadium	+/-	J/UJ
all samples	vanadium	+/-	J/UJ
75SB04-00, 74SB04-00D	lead	+	R
all samples	all analytes	+B	J

Tin by 6010B

Sample ID	Analyte	Results	Q flag
all samples >MDL ≤ RL	tin	+B	U at RL

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

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

Inorganic Methods

ICB/CCB/PB Action:

NA -	The sample result is greater than the RL and greater than ten times (10X) the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers
U*	The sample result for the blank contaminant is less than the RL but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.

Glossary of Qualification Flags and Abbreviations, continued

RL** The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

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

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

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 RL.

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

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 RL and greater than ten times (10X) the blank value.

U* The sample result for the blank contaminant is less than the RL but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.

RL** The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

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

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

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

Glossary of Qualification Flags and Abbreviations, continued

General Abbreviations

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

PUERTO RICAN CHEMIST CERTIFICATION

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Diesel Range organics fraction following Method 8015C, from Project Name NAPR SWMU75/DO, and Laboratory ID Numbers:

1003251-01
1003251-02
1003251-03

Lcda. Daliz M. Estades Santaliz

PO Box 727
Dorado, PR 00646-0727

Ðaliz Ëstades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Gasoline Range Organics (GRO) following Method 8015B, from Project Name NAPR SWMU75/DO, and Laboratory ID Numbers:

1003251-01
1003251-02
1003251-03

Lcda. Daliz M. Estades Santaliz

PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Volatile Fraction following Method 8260B, from Project Name NAPR SWMU75/DO, and Laboratory ID Numbers:

1003251-01
1003251-02
1003251-03

Lcda. Daliz M. Estades Santaliz

PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Metal Tin following Method SW 846, from Project Name NAPR SWMU75/DO, and Laboratory ID Numbers:

1003251-01
1003251-02

Daliz M. Estades Santaliz
Lcda. Daliz M. Estades Santaliz

PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Semivolatile and semivolatile selected Ion Monitoring (SIM) fractions following Method 8270C, from Project Name NAPR SWMU75/DO, and Laboratory ID Numbers:

1003251-01
1003251-02

Lcda. Daliz M. Estades Santaliz

PO Box 727
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Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for APPIX metals (minus tin) and mercury following Method SW 846-6020, from Project Name NAPR SWMU75/DO, and Laboratory ID Numbers:

1003251-01
1003251-02

Lcda. Daliz M. Estades Santaliz

PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Semivolatile and semivolatile selected Ion Monitoring (SIM) fractions following Method 8270C, from Project Name NAPR SWMU75/DO, and Laboratory ID Numbers:

1003252-01	1003252-09
1003252-02	1003252-10
1003252-03	1003252-11
1003252-04	1003252-12
1003252-05	1003252-13
1003252-06	1003252-14
1003252-07	1003252-15
1003252-08	1003252-16

ESTADO LIBRE ASOCIADO DE PUERTO RICO
Daliz M. Estades Santaliz
Lcda. Daliz M. Estades Santaliz
Lic. 4026
QUIMICO LICENCIADO
A 1325628

PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for APPIX metals (minus tin) and mercury following Method SW 846-6020, from Project Name NAPR SWMU75/DO, and Laboratory ID Numbers:

1003252-01	1003252-09
1003252-02	1003252-10
1003252-03	1003252-11
1003252-04	1003252-12
1003252-05	1003252-13
1003252-06	1003252-14
1003252-07	1003252-15
1003252-08	1003252-16

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Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Metal Tin following Method SW 846, from Project Name NAPR SWMU75/DO, and Laboratory ID Numbers:

1003252-01	1003252-09
1003252-02	1003252-10
1003252-03	1003252-11
1003252-04	1003252-12
1003252-05	1003252-13
1003252-06	1003252-14
1003252-07	1003252-15
1003252-08	1003252-16

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Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Gasoline Range Organics (GRO) following Method 8015B, from Project Name NAPR SWMU75/DO, and Laboratory ID Numbers:

1003252-01	1003252-09
1003252-02	1003252-10
1003252-03	1003252-11
1003252-04	1003252-12
1003252-05	1003252-13
1003252-06	1003252-14
1003252-07	1003252-15
1003252-08	1003252-16

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Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for volatile fraction, following Method 8260B from Project Name NAPR SWMU75/DO, and Laboratory ID Numbers.

1003252-01	1003252-09
1003252-02	1003252-10
1003252-03	1003252-11
1003252-04	1003252-12
1003252-05	1003252-13
1003252-06	1003252-14
1003252-07	1003252-15
1003252-08	1003252-16

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Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Diesel and Oil range organics fraction, following Method 8015C from Project Name NAPR SWMU75/DO, and Laboratory ID Numbers.

1003252-01	1003252-09
1003252-02	1003252-10
1003252-03	1003252-11
1003252-04	1003252-12
1003252-05	1003252-13
1003252-06	1003252-14
1003252-07	1003252-15
1003252-08	1003252-16

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