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Corrective Measures Study Addendum SWMUs 7 and 8 – Revised Soil Remedy

Tow Way Fuel Farm Area
Naval Activity Puerto Rico
Ceiba, Puerto Rico

Revision No. 00

Contract No. N62470-08-D-1006
Task Order No. JM04

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Southeast

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March 2010

Certification Page for Corrective Measures Study Addendum (Revision 0)
SWMUs 7 and 8 – Revised Soil Study

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Date: **March 8, 2010**

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Acronyms and Abbreviations

AGVIQ-CH2M HILL	AGVIQ-CH2M HILL Joint Venture III
ATSDR	Agency for Toxic Substances and Disease Registry
Baker	Baker Environmental, Inc.
bgs	below ground surface
CAO	Corrective Action Objective
CMS	Corrective Measures Study
DPT	Geoprobe™ direct-push sampling techniques
Empirical	
EPA	U.S. Environmental Protection Agency
mg/kg	milligrams per kilogram
MS/MSD	matrix spike/matrix spike duplicate
NAPR	Naval Activity Puerto Rico
NAVFAC SE	Naval Facilities Engineering Command Southeast
ND	non-detect
PAH	polynuclear aromatic hydrocarbon
QA	quality assurance
QC	quality control
SWMU	solid waste management unit
TWFF	Tow Way Fuel Farm
UCL95%	upper-bound confidence limits at 95 percent
UFP-SAP	Uniform Federal Policy - Sampling and Analysis Plan

1.0 Site and Project Introduction

AGVIQ-CH2M HILL Joint Venture III (AGVIQ-CH2M HILL) was contracted by the Department of the Navy, Naval Facilities Engineering Command Southeast (NAVFAC SE), under Contract No. N62470-08-D-1006, Task Order JM04, to implement corrective measures at Solid Waste Management Units (SWMU) 7 and 8 located at the Tow Way Fuel Farm (TWFF), Naval Activity Puerto Rico (NAPR), Ceiba, Puerto Rico. This Corrective Measures Study (CMS) Addendum describes the soil sampling procedures and results of the soil delineation activities performed between January 22, 2009, and July 15, 2009. Sampling was performed in three areas of the site where the polynuclear aromatic hydrocarbon (PAH) compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, and the element arsenic exceeded the corrective action objectives (CAOs) established in the CMS prepared by Baker Environmental, Inc. (Baker) in November 2005. Excavation of the upper 2-feet of soil was proposed in the CMS to remove the contamination from three areas of concern. The U.S. Environmental Protection Agency (EPA) approved the CMS for implementation in February 2006.

The objectives of the sampling were to:

- Refine the limits of excavation because the three areas of concern as presented in the CMS were based on the extrapolation of a limited set of soil analytical data.
- Determine the current concentrations of the PAH compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene in the upper 2 feet of soil because the possibility exists that concentrations may have decreased through biological degradation and are now below the applicable CAOs.
- Determine if arsenic concentrations in the upper 2 feet of soil fall within the range of background concentrations for the island of Puerto Rico, and/or are present at concentrations that are statistically below the CAO. If so, the area of arsenic contamination requiring excavation may be smaller in size or may not be required.

In order to meet these objectives, the following tasks were performed:

- Marked the locations of the soil delineation sampling points by establishing grids over the three areas of concern targeted for excavation in the CMS.
- Collected soil samples from the upper 2-feet of soil using a direct push technology (DPT) drill rig. In areas were a DPT drill rig could not be used due to steep changes in topography or because of physical obstructions, samples were collected using a hand auger.
- Submitted soil samples from 18 borings for the analysis of the PAH compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene using EPA Method 8270C.
- Submitted soil samples from 72 borings for the analysis of arsenic using EPA Method 6010B.

- Grouted the holes upon completion.
- Retained the services of a professionally licensed land surveyor to survey the horizontal locations and vertical elevations of the boreholes relative to previously established benchmarks.

The CMS Addendum is organized as follows:

- Site and Project Introduction
- Summary of Field Investigation Procedures
- Discussion of Results
- Conclusions and Recommendations

1.1 Site Description and Project Background

NAPR occupies over 8,600 acres at the northeastern most portion of Puerto Rico along the Vieques Passage (Figure 1-1). The northern entrance to NAPR is about 35 miles east, along the coastal road (Route 3), from San Juan. The facility was commissioned in 1943 as a Naval Operations Base, but was re-designated a Naval Station in 1957.

The TWFF is located on a hillside along Forrestal Drive north of Ensenada Honda (Figure 1-2). The final CMS Report, prepared by Baker in November 2005, presented CAOs and remedial approaches to address cleanup of soil and groundwater at multiple SWMUs across the NAPR, including SWMU 7/8. The EPA approved the CMS for implementation in February 2006.

The regulatory-approved remedial action to address soil contamination at SWMU 7/8 includes the excavation of the upper 2-feet of soil in three areas of concern where the PAH compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, and arsenic exceeded their respective CAOs. The CAOs for the contaminants of concern are presented in Table 1-1. Baker developed the CAOs using an industrial classification risk-exposure scenario involving construction worker contact with surface and subsurface soil.

Figures 1-3 through 1-7 illustrate areas where Baker determined arsenic, benzo(a)-anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene) exceeded the CAOs. These figures were obtained from the EPA-approved CMS. The data presented in the CMS indicated that the vertical extent soil contamination above the CAOs was limited to the upper 2 feet of soil. Using the Natural Neighbor interpolation approach of the computer model GMS v5.1, Baker estimated the areal extent of contamination requiring excavation through the extrapolation of a limited set of soil analytical data. The three areas of concern requiring excavation based on Baker's modeling effort are shown on Figure 1-8.

Because the areas requiring excavation were based on modeling results, AGVIQ-CH2M HILL prepared a Uniform Federal Policy-Sampling and Analysis Plan (UFP-SAP) and Work Plan to perform a pre-excavation delineation of SWMU 7/8 to verify the limits of excavation described in the CMS, and to determine if arsenic is naturally occurring or is a result of past practices used by the Navy. The UFP-SAP and Work Plan were submitted to the Navy during the first quarter of 2009 and approved for implementation in April 2009.

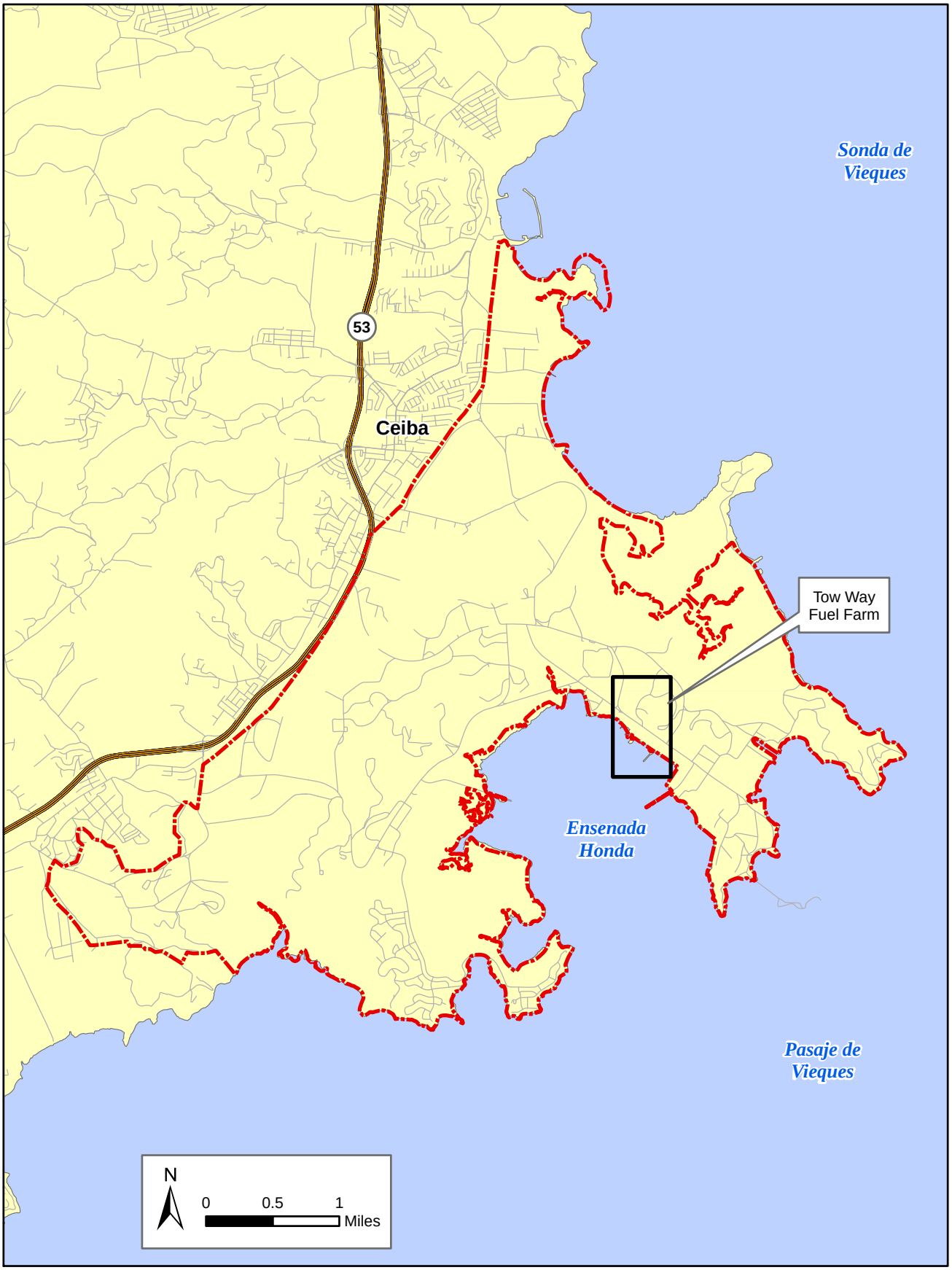
TABLE 1-1
Soil CAOs

Chemical	Maximum Observed Concentration	Surface Soil CAO*	Subsurface Soil CAO*	Total Soil CAO**
Arsenic	3.4	2.65	NA	NA
Benzo(a)anthracene	6J	2.9	NA	73
Benzo(a)pyrene	23J	2.9	7.3	7.3
Benzo(b)fluoranthene	5.9J	2.9	NA	73
Indeno(1,2,3-cd)pyrene	5.3J	2.9	NA	73

CAO Corrective Action Objective
* Based on industrial worker protection
** Based on construction worker protection
J Estimated
NA Not Applicable
All values reported in milligrams per kilogram (mg/kg).
Surface Soil – 0 to 2 feet
Subsurface Soil – 0 to 10 feet

1.2 Justification and Rationale for Pre-excavation Delineation Activities

The CMS recommended excavation to remove contaminants in the upper 2 feet of soil. However, the size of the three excavation areas were calculated by Baker using a computer model, and the data used in the model were collected prior to 2005. Therefore, it is likely that the excavation areas will differ in size and/or shape than those depicted in the CMS. Therefore, AGVIQ-CH2M HILL recommended the collection of additional soil samples in the three excavation areas to verify the horizontal extent of contamination prior to mobilizing excavation equipment to the field.



Road

Expressway

Naval Station Roosevelt Roads Boundary

FIGURE 1-1
Tow Way Fuel Farm Location
Naval Station Roosevelt Roads, Puerto Rico

Fence

Former Fuel Tank

N

0 100 200 Feet

1 inch = 200 feet

FIGURE 1-2
SWMU 7/8 Base Map
Tow Way Fuel Farm
Naval Station Roosevelt Roads, Puerto Rico

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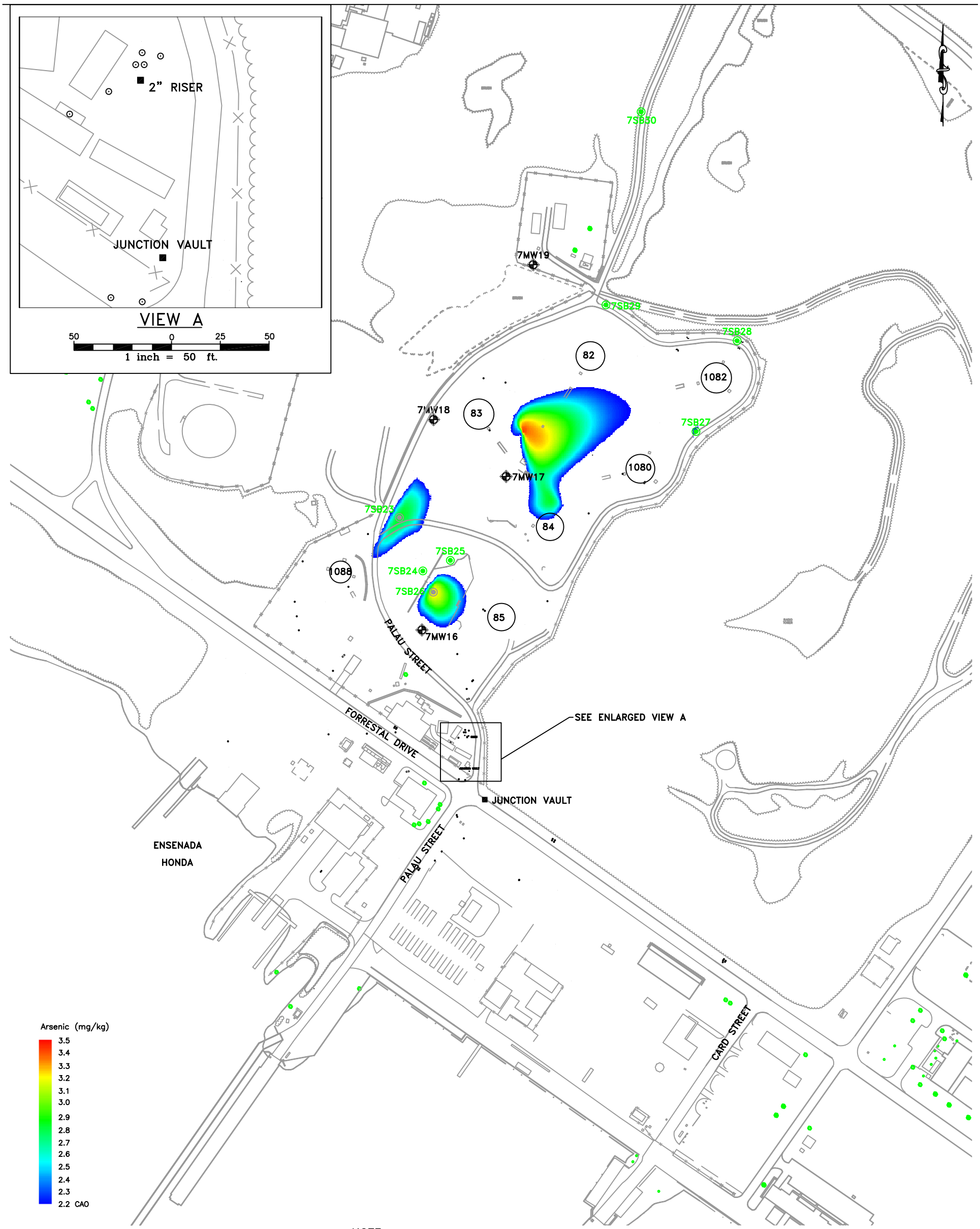

NOTE:
DATUM PLAN USED IS MEAN LOW WATER = 100.00 FT. AS ESTABLISHED BY U.S. NAVY SURVEY SECTION AS OF NOVEMBER 1941.

K\26007\033Phase\Draft TWFF CMS Final Rep\CMS004

SOURCE: LANTDIV, FEB. 1992/1997

LEGEND

- NEW MONITOR WELL LOCATION
- SOIL BORING LOCATION

Source: Baker Environmental, Inc. *Revised Final CMS Final Report for TWFF.* November 22, 2005

FIGURE 1-3
Surface Soil with Arsenic Above CAO
Corrective Measures Study - Final Report
Tow Way Fuel Farm, Puerto Rico

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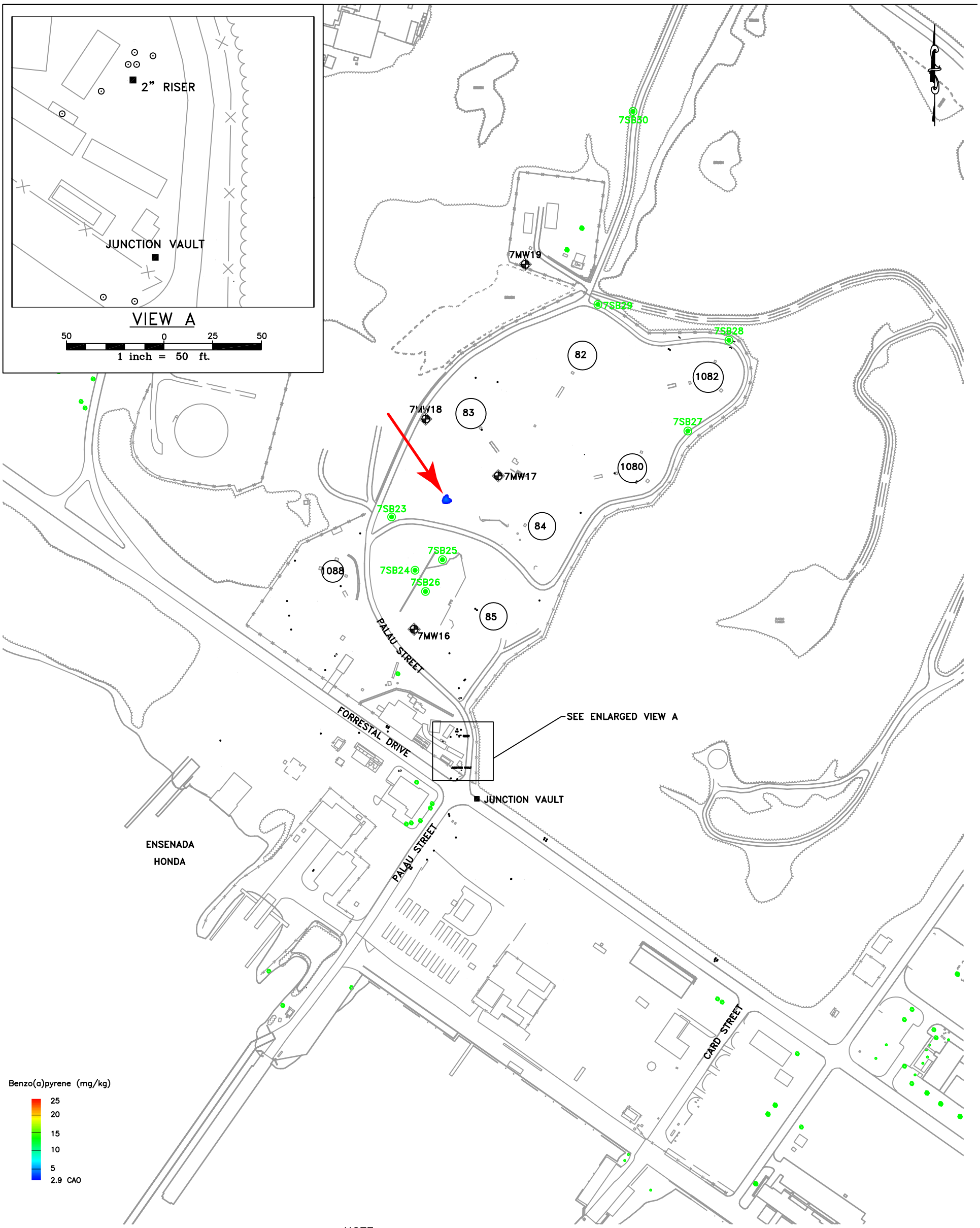

NOTE:
DATUM PLAN USED IS MEAN LOW WATER = 100.00 FT. AS ESTABLISHED BY U.S. NAVY SURVEY SECTION AS OF NOVEMBER 1941.

K\26007\033Phase\Draft TWFF CMS Final Rep\CMS005

SOURCE: LANTDIV, FEB. 1992/1997

LEGEND

- NEW MONITOR WELL LOCATION
- SOIL BORING LOCATION

Source: Baker Environmental, Inc. *Revised Final CMS Final Report for TWFF.* November 22, 2005

FIGURE 1-4
Surface Soil with Benzo(a)anthracene Above CAO
Corrective Measures Study - Final Report
Tow Way Fuel Farm, Puerto Rico

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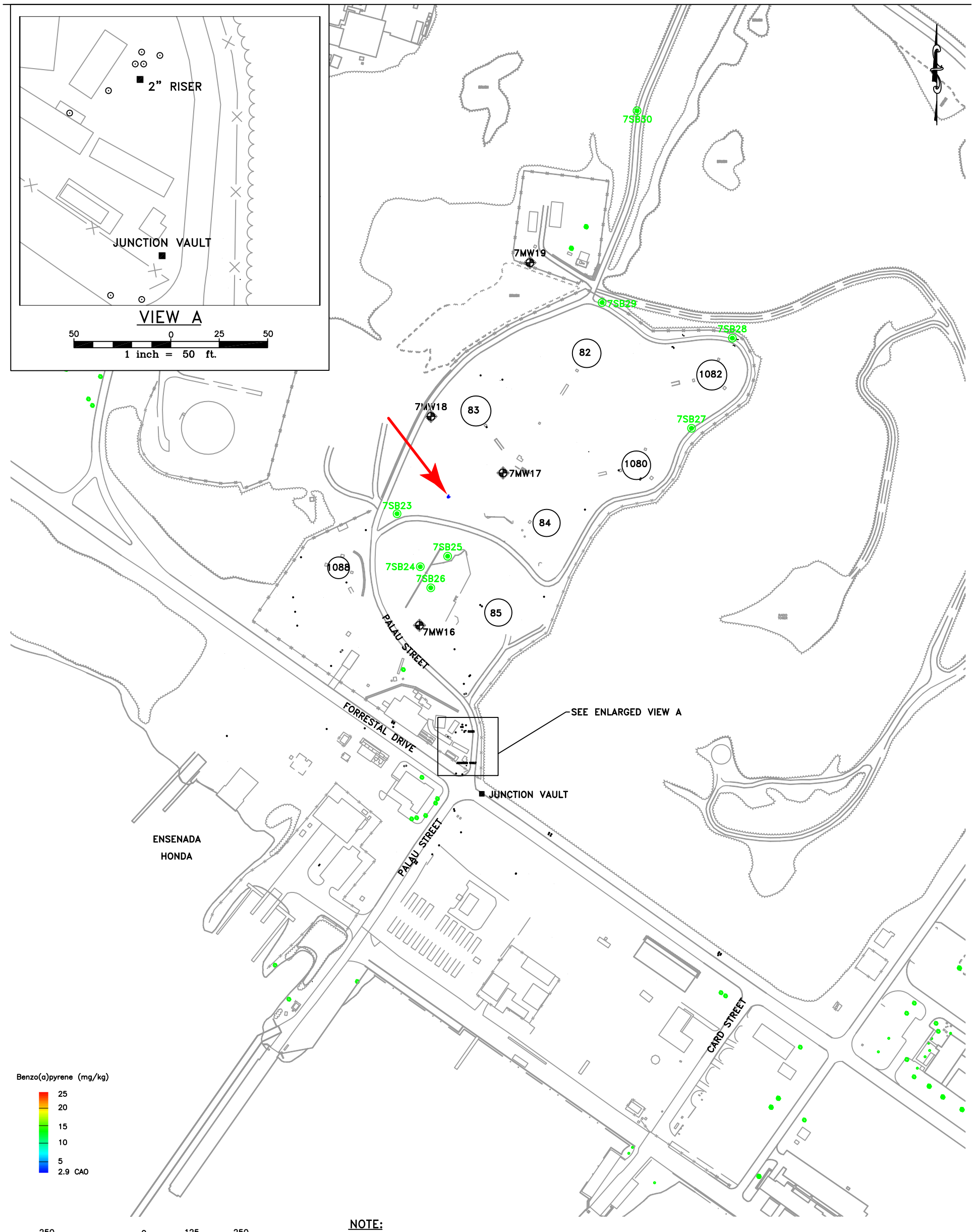

NOTE:
DATUM PLAN USED IS MEAN LOW WATER = 100.00 FT. AS ESTABLISHED BY U.S. NAVY SURVEY SECTION AS OF NOVEMBER 1941.

K\26007\033Phase\Draft TWFF CMS Final Rep\CMS007

SOURCE: LANTDIV, FEB. 1992/1997

LEGEND

- NEW MONITOR WELL LOCATION
- SOIL BORING LOCATION

FIGURE 1-5
Surface Soil with Benzo(a)fluoranthene Above CAO
Corrective Measures Study - Final Report
Tow Way Fuel Farm, Puerto Rico

Source: Baker Environmental, Inc. *Revised Final CMS Final Report for TWFF.* November 22, 2005

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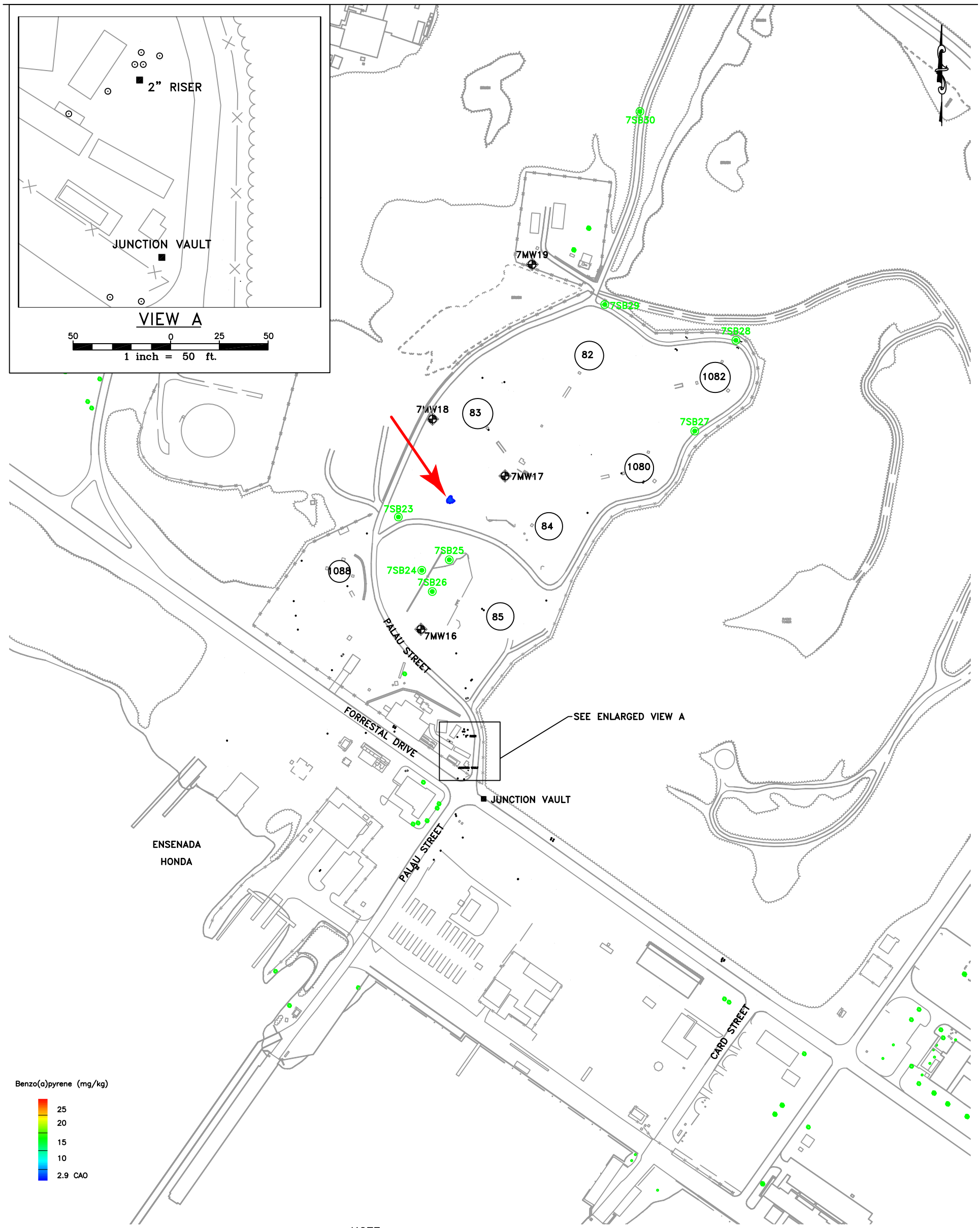
ES122008007ATL 103.ai



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NOTE:
DATUM PLAN USED IS MEAN LOW WATER = 100.00 FT. AS ESTABLISHED BY U.S. NAVY SURVEY SECTION AS OF NOVEMBER 1941.

SOURCE: LANTDIV, FEB. 1992/1997

LEGEND

- NEW MONITOR WELL LOCATION
- SOIL BORING LOCATION

FIGURE 1-6
Surface Soil with Indeno(1,2,3-cd)pyrene Above CAO
Corrective Measures Study - Final Report
Tow Way Fuel Farm, Puerto Rico

Source: Baker Environmental, Inc. *Revised Final CMS Final Report for TWFF.* November 22, 2005

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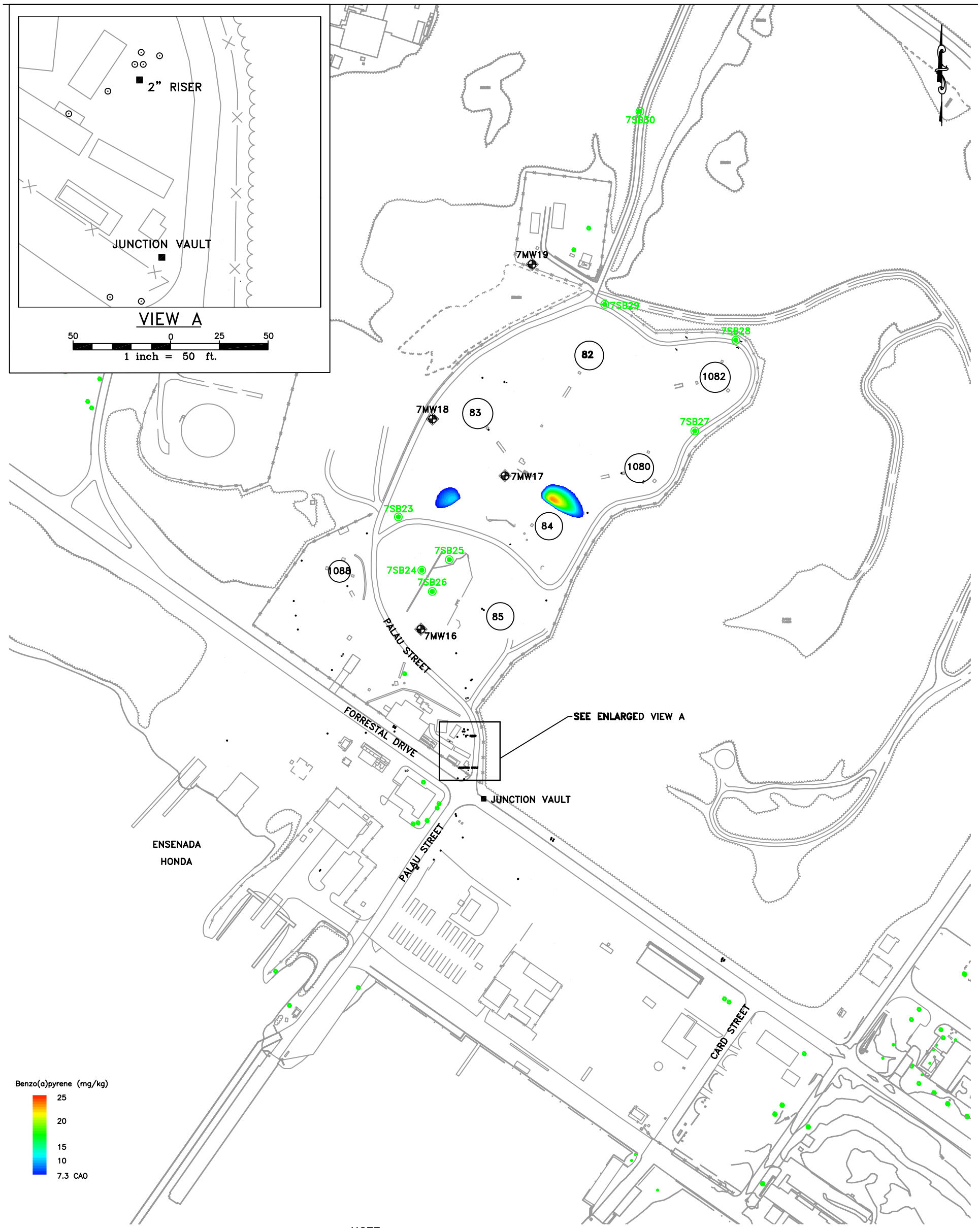
ES122008007ATL 104.ai



K\26007\033Phase\Draft TWFF CMS Final Rep\CMS009

NOTE:
DATUM PLAN USED IS MEAN LOW WATER = 100.00 FT. AS ESTABLISHED BY U.S. NAVY SURVEY SECTION AS OF NOVEMBER 1941.

SOURCE: LANTDIV, FEB. 1992/1997

LEGEND

- NEW MONITOR WELL LOCATION
- SOIL BORING LOCATION

FIGURE 1-7
Total (Surface and Subsurface) Soil with Benzo(a)pyrene Above CAO
Corrective Measures Study - Final Report
Tow Way Fuel Farm, Puerto Rico

Source: Baker Environmental, Inc. *Revised Final CMS Final Report for TWFF.* November 22, 2005

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Existing Soil Sampling Location for SVOC

Existing Soil Sampling Location for Arsenic

Fence

Assumed Impacted Soil Area (See Note)

8TP02 Soil sample with concentrations (in milligrams per kilogram [mg/kg]) above Corrective Action Objectives (CAOs):
Arsenic: 2.65 mg/kg
Benzo(a)anthracene: 2.9 mg/kg
Benzo(a)pyrene: 2.9 mg/kg
Benzo(b)fluoranthene: 2.9 mg/kg
Indeno(1,2,3-cd)pyrene: 2.9 mg/kg
J = Estimated Detected Concentration

FIGURE 1-8

CMS Soil Delineation Sample Locations and Proposed Excavation Areas
Tow Way Fuel Farm
Naval Station Roosevelt Roads, Puerto Rico

CH2MHILL

2.0 Summary of Field Investigation Procedures

This section describes the work procedures that were used between January 22, 2009, and July 15, 2009 to verify the limits of excavation.

2.1 Pre-excavation Sample Grid

On January 22 and 23, 2009, AGVIQ-CH2M HILL personnel marked the locations of the sampling grids over the three areas of concern identified in the CMS. A grid spacing of 50 feet was used, and was developed following the EPA's publication entitled, *Preparation of Soil Sampling Protocols: Sampling Techniques and Strategies* (EPA, 1992). The grid was laid out using a Topcon® transit and engineers tape. During the fieldwork, AGVIQ-CH2M HILL personnel attempted to install the sampling points in the locations as presented in the UFP-SAP and Work Plan(see Figure 2-1). However, due to the presence of obstructions (tanks and piping) and variations in topography (steep hillsides), several of the sampling locations had to be either moved or omitted. The actual sample locations are depicted on Figure 2-2.

2.2 Pre-Excavation Soil Sampling Procedures

Soil sampling activities were conducted between June 1 and 4, 2009. The work was performed in accordance with the Navy approved UFP-SAP and Work Plan. Prior to beginning any intrusive work, each borehole was cleared for underground utility obstructions by One Vision, Inc. of Kennesaw, Georgia.

In areas accessible by vehicle, a truck-mounted DPT rig was used to collect continuous soil samples from the upper 2-feet of soil (0 to 2 feet below ground surface [bgs]). A hand auger was used to collect soil samples from the upper 2 feet of soil in areas that could not be accessed by the drill rig. The DPT and hand auger work was performed by GeoEnvironTech, Inc. of Guaynabo, Puerto Rico. The DPT work was performed using a 5410 model Geoprobe® drill rig. Upon retrieval of each soil sample, the AGVIQ-CH2M HILL geologist visually inspected the sample and described the lithology encountered. Lithologic information for each sample point is summarized on Table 2-1. The soil was homogenized by placing the soil in a stainless steel bowl and mixing the soil using a stainless steel spoon. The homogenized soil was transferred to 4-ounce glass jars provided by the laboratory for chemical analysis. All samples were analyzed for arsenic using EPA Method 6010B, and select samples were analyzed for benzo(a)anthracene, benzo(a)pyrene, benzo(b)-fluoranthene, and indeno(1,2,3-cd)pyrene using EPA Method 8270C. The analyses performed at each sample location are shown on Figure 2-2 and test results are included in Table 2-1. As illustrated on Figure 2-2, samples from locations A24 and B7 were not analyzed for PAHs due to the observed presence of asphalt in the soil, which is a common source of PAH compounds. Therefore, the samples from locations A24 and B7 were only analyzed for arsenic.

The samples were labeled using the alphanumeric coordinate system depicted on Figure 2-2. Sample nomenclature consisted of the task order number, the alphanumeric coordinate, sample depth, and sampling date. For example, a sample was collected at location B10 on June 4, 2009; therefore, the sample identification (ID) is JM04-B10(2.0)-060409.

The soil samples were logged, stored in 4-ounce glass jars, wrapped in bubble wrap, double-sealed in Ziploc® bags, and packed on ice for shipment to Empirical Laboratories, Inc., located in Nashville, Tennessee, following standard chain-of-custody procedures. Laboratory data sheets and chain-of-custody records are included in Appendix A.

A total of 72 soil samples were collected during the pre-excavation delineation sampling event. For quality assurance/quality control (QA/QC) purposes, 15 additional samples were submitted for QA/QC analysis. These samples included 3 matrix spike/matrix spike duplicates (MS/MSDs), 7 duplicate samples, and 5 equipment blanks.

2.3 Borehole Abandonment

Upon completion of the work, the DPT and hand auger boreholes were filled with a Portland cement/grout slurry containing 3 to 5 percent bentonite.

2.4 Surveying

Following the completion of sampling activities, each sample location was surveyed (horizontal location and vertical elevation) by Pedro J. Davila Colon of PJDC, Inc., a Puerto Rico licensed land surveyor. The surveying work was performed between July 2, 2009, and July 15, 2009. Locations were surveyed relative to previously established benchmarks. Coordinate data for each sampling location are presented on Table 2-1.

Table 2-1
Pre-Excavation Soil Delineation Sample Summary at SWMU 7/8 (June 2009)
Roosevelt Roads Naval Station, Puerto Rico

Sample Date	Station ID	Coordinates		Elevation	Sample ID	Sample method	Quality Control	USCS	Description	Proximity to existing Asphalt	Other notes
		Easting	Northing	feet NGVD 29							
6/3/2009	A1	782265.280	147022.775	74.00	JM04-A1(2.0)-060309	Hand Auger	---	CL	Silty Clay with cobbles, cobbles are angular gabbro, firm, moderate moist at top to low moisture near bottom, brown, (10YR 4/3)	>30'	Sample collected with hand auger due to accessibility issues.
6/3/2009	A2	**782312.690**	**147036.239**	**69.70**	JM04-A2(2.0)-060309	Hand Auger	---	OL	Silty Clay, Organic, low to medium plasticity, very stiff, moderate moist, brown (5YR 4/2)	>30'	---
--	A3	---	---	---	NA	---	---	---	---	---	---
--	A4	---	---	---	NA	---	---	---	---	---	---
--	A5	---	---	---	NA	---	---	---	---	---	---
6/3/2009	A6	**782222.222**	**146961.035**	**71.71**	JM04-A6(2.0)-060309	Hand Auger	---	CL	Silty Clay, angular cobbles, firm, Brown (10YR 4/4)	>30'	Sample collected with hand auger due to accessibility issues.
6/3/2009	A7	**782268.962**	**146973.733**	**66.05**	JM04-A7(2.0)-060309	Hand Auger	---	CL	Silty Clay, ~20% angular cobbles, 30% silt, 50% clays, moderate moisture, low to moderate plasticity, dark brown (10YR 3/3)	>30'	Sample collected with hand auger due to accessibility issues.
6/3/2009	A8	**782316.551**	**146986.591**	**62.67**	JM04-A8(2.0)-060309	Hand Auger	Field Duplicate	OH	Silty Clay, high plasticity, moderate moisture, ~80% Clay, trace angular cobbles, very stiff, brown (10YR 4/2)	>30'	Sample collected with hand auger due to accessibility issues.
6/4/2009	A9	**782365.126**	**146999.485**	**63.70**	JM04-A9(2.0)-060409	DPT	---	CL/ GW	Silty Clay with cobbles, ~50% angular gravel and cobble, soil is silty clay ~40 silt, moderate moisture, low to moderate plasticity, moderate cohesion, light to dark brown (10YR 5/4)	>30'	---
6/4/2009	A10	**782411.978**	**147010.776**	**69.86**	JM04-A10(2.0)-060409	Hand Auger	MS/MSD	OL	Silty Clay, moderate plasticity, high moisture, angular cobbles, no odor, trace **asphalt** debris brown (10YR 4/2)	>30'	Sample contained asphalt debris but was not originally scoped to be sampled for PAH's.
6/3/2009	A11	**782461.168**	**147011.818**	**69.70**	JM04-A11(2.0)-060309	Hand Auger	---	CL	Silty Clay, ~50% clay, little sands, angular cobbles, wet at top, dry near bottom, thin SW layer near bottom, dark brown (10YR 4/2)	>30'	Sample collected with hand auger due to accessibility issues.
6/3/2009	A12	**782496.254**	**147020.861**	**68.25**	JM04-A12a(2.0)-060309	Hand Auger	---	CH	Clay, little silt, little angular cobble, "modeling clay" gleyed color with red mottling, moderate moisture, high plasticity, strong cohesion, stiff, gray-brown (10Y 6/3)	>30'	Sample collected with hand auger due to accessibility issues. Sample was moved 10 feet southeast due to accessibility issues.
--	A13	---	---	---	NA	---	---	---	---	---	---
6/3/2009	A14	**782224.442**	**146911.443**	**59.05**	JM04-A14(2.0)-060309	Hand Auger	MS/MSD	CL	Silty Clay with cobbles, ~30% silt, 50% clay, moderate to low moisture, low plasticity, dark brown (10YR 4/3)	>30'	Sample collected with hand auger due to accessibility issues.
6/2/2009	A15	**782270.728**	**146924.789**	**55.66**	JM04-A15(2.0)-060209	DPT	---	CL/ GW	Silty Clay with cobbles, ~70% clay, cobbles are angular, low moisture, low plasticity, very stiff, brown (10YR 4/4)	>30'	---
6/2/2009	A16	**782318.965**	**146937.109**	**56.86**	JM04-A16(2.0)-060209	DPT	Field Duplicate	SW ML	Silty Sand/ Sandy Silt, Sand is fine to very coarse grained, ~40% cobbles, angular, dry, Brown (5Y 5/2)	>30'	---
6/4/2009	A17	**782366.883**	**146949.807**	**60.17**	JM04-A17(2.0)-060409	DPT	---	OH	Silty Clay with sand and cobbles, low cohesion, high plasticity, organic, fine sands ~15%, trace angular cobbles, ~45% clay, ~40% silts, moderate moisture dark brown (10YR 3/2)	>30'	---
6/4/2009	A18	**782415.376**	**146961.725**	**65.05**	JM04-A18(2.0)-060409	DPT	---	CH	Clay, few angular cobbles, high plasticity, moderate moisture, ~40% silts, moderate cohesion, brown (10YR 4/3)	>30'	---
6/4/2009	A19	**782464.473**	**146974.042**	**68.67**	JM04-A19(2.0)-060409	DPT	---	CL	Silty Clay, ~35% silt, good cohesion, low plasticity, moderate to low moisture, gray and brown (5YR 6/2)	>30'	---
6/3/2009	A20	**782512.975**	**146986.978**	**70.75**	JM04-A20(2.0)-060309	DPT	---	CL	Silty Clay, low to moderate plasticity, one 2" thick zone of CH near 2' bgs, medium stiff, moderate moist, ~35% silt, some organic material, brown (10YR 3/4)	>30'	---
--	A21	---	---	---	NA	---	---	---	---	---	---
6/2/2009	A22	**782226.363**	**146862.636**	**50.81**	JM04-A22(2.0)-060209	DPT	Field Duplicate	ML	Clayey Sandy Silt, low moisture, low plasticity, trace angular gravel, little organic clay, brown (5Y 3/4)	>30'	---
6/2/2009	A23	782275.211	146874.895	51.82	JM04-A23(2.0)-060209	DPT	---	CL	Silty Clay with gravel and cobbles, dry, has no odor, contains some "black specks" (10Y 3/2)	>30'	This sample was closely examined to verify there was no asphalt in the sample, the "black specks" were tiny chips of gabbro.

Table 2-1
Pre-Excavation Soil Delineation Sample Summary at SWMU 7/8 (June 2009)
Roosevelt Roads Naval Station, Puerto Rico

Sample Date	Station ID	Coordinates		Elevation	Sample ID	Sample method	Quality Control	USCS	Description	Proximity to existing Asphalt	Other notes
		Easting	Northing	feet NGVD 29							
6/2/2009	A24	782323.614	146887.774	54.23	JM04-A24(2.0)-060209	DPT	---	CL	Silty Clay with cobbles, very stiff, low moisture, trace odor, contains **asphalt** fragments, brown (5Y 4/2)	>30'	No PAH sample taken due to the presence of asphalt in the sample collected.
6/4/2009	A25	**782371.032**	**146899.353**	**58.73**	JM04-A25(2.0)-060409	DPT	Field Duplicate	OL	Silty Clay, little angular very coarse sand, gravel, and cobble, low plasticity, good cohesion, moderate moisture, abundant organics, brown (10YR 4/3)	>30'	---
6/3/2009	A26	**782419.115**	**146911.606**	**63.56**	JM04-A26(2.0)-060309	DPT	---	CH	Silty Clay, high to moderate plasticity, moderate moisture, medium stiff, dark brown (10YR 3/4)	>30'	---
6/3/2009	A27	**782468.611**	**146924.622**	**67.13**	JM04-A27(2.0)-060309	DPT	---	CH	Clay, high plasticity, little silt, moderate moisture, trace very course sands, light brown (10YR 3/4)	>30'	---
6/2/2009	A28	**782229.996**	**146812.279**	**46.58**	JM04-A28(2.0)-060209	DPT	---	ML	Sandy Silt with cobbles, low moisture, angular cobbles, little sand, some clays, dark brown (5Y 4/3)	>30'	---
6/2/2009	A29	**782278.144**	**146824.565**	**50.02**	JM04-A29(2.0)-060209	DPT	---	ML	Gravelly Clayey Silt, dry, low plasticity, very stiff, little organic clay, brown (5Y 4/4)	>30'	---
6/2/2009	A30	**782325.983**	**146837.821**	**52.94**	JM04-A30(2.0)-060209	DPT	---	CL	Silty Clay, Stiff, with gravel, low moisture, angular cobble and gravel, little sand, light brown (10YR 4/3)	>30'	---
6/2/2009	A31	**782374.454**	**146850.432**	**56.67**	JM04-A31(2.0)-060209	DPT	---	ML	Clayey Silt, low plasticity, ~30% clays, some angular cobbles, little fine to course sands, moderate moisture, brown (5Y 7/3)	>30'	---
6/2/2009	A32	**782422.594**	**146861.752**	**60.78**	JM04-A32(2.0)-060209	DPT	---	CL	Clay, little silt, no sands, very stiff, low plasticity, low moisture, trace gray lamination, reddish brown (5YR 4/6)	>30'	---
6/2/2009	A33	**782233.911**	**146763.622**	**44.48**	JM04-A33(2.0)-060209	DPT	---	ML	Sandy Silt, Stiff, little sand, some clays, low plasticity, low moisture, few angular cobbles, dark brown (5Y 4/3)	>30'	---
6/2/2009	A34	**782282.361**	**146775.153**	**48.38**	JM04-A34(2.0)-060209	DPT	---	ML	Sandy Silt with lean clay lense and cobbles, low to moderate moisture, clay has moderate plasticity cobbles are angular, sand is ~20%, dark brown (5Y 3/2)	>30'	---
6/2/2009	A35	**782330.677**	**146786.999**	**52.54**	JM04-A35a(2.0)-060209	DPT	---	CL	Silty Clay with cobbles, very stiff, cobbles are angular ~ 50% cobbles, low moisture, soil is dark brown (5Y 4/2)	>30'	Sample location moved 5 feet to the north to allow for utilities, first attempt yielded no return.
6/2/2009	A36	**782376.892**	**146800.395**	**60.10**	JM04-A36(2.0)-060209	DPT	---	OL	Silty Clay, Stiff, ~35% silt, little sand, trace angular cobbles, low moisture, dark brown (5Y 4/2)	>30'	---
6/2/2009	A37	**782232.443**	**146714.574**	**42.86**	JM04-A37(2.0)-060209	DPT	---	ML/ GW	Silt with cobbles and gravel, angular, low moisture, some organic clays, dark brown (5Y3/2)	>30'	---
--	A38	---	---	---	NA	---	---	---	---	---	---
6/2/2009	A39	**782333.512**	**146738.135**	**57.43**	JM04-A39(2.0)-060209	DPT	---	ML/ GW	Cobbly Silt, ~70% cobbles, sandy silt matrix, little organic clay, dry, dark brown (5Y 4/2)	>30'	Sample moved 5 inches west due to no recovery on first attempt
6/2/2009	A40	**782380.125**	**146750.176**	**65.20**	JM04-A40(2.0)-060209	Hand Auger	---	ML/ GW	Sandy Silt with cobbles, some clays, low moisture, angular cobbles, dark brown 10YR 3/3	>30'	Sample collected with hand auger due to accessibility issues.
6/2/2009	A41	**782382.410**	**146700.951**	**71.30**	JM04-A41(2.0)-060209	Hand Auger	MS/MSD	CL/ GW	Silty Clay with cobbles, Moderate moisture, low to moderate plasticity, angular cobbles, brown (10YR 4/3)	>30'	Sample collected with hand auger due to accessibility issues.
--	A42	---	---	---	NA	---	---	---	---	---	---
--	A43	---	---	---	NA	---	---	---	---	---	---
--	A44	---	---	---	NA	---	---	---	---	---	---
--	A45	---	---	---	NA	---	---	---	---	---	---
6/4/2009	B1	781998.036	146811.458	55.02	JM04-B1(2.0)-060409	DPT	---	ML	Sandy Silt, little clay, sand is fine to coarse grained, low moisture to dry, few angular cobbles, loose, light brown (5Y 6/3)	>30'	---

Table 2-1
Pre-Excavation Soil Delineation Sample Summary at SWMU 7/8 (June 2009)
Roosevelt Roads Naval Station, Puerto Rico

Sample Date	Station ID	Coordinates		Elevation	Sample ID	Sample method	Quality Control	USCS	Description	Proximity to existing Asphalt	Other notes
		Easting	Northing	feet NGVD 29							
6/4/2009	B2	782042.100	146795.968	50.36	JM04-B2(2.0)-060409	DPT	---	ML	Clayey Silt with cobbles, moderate moisture, low plasticity, low cohesion, little fine sands, ~35% angular gravel and cobble, Brown 10YR 5/4	>30'	---
6/4/2009	B3	**782086.507**	**146779.982**	**43.70**	JM04-B3(2.0)-060409	Hand Auger	Field Duplicate	CL	Silty Clay with sand, low cohesion, moderate moisture, low plasticity, sand is fine to very coarse grained, angular, abundant gravel, dark brown (10YR 3/2)	>30'	Sample collected with hand auger due to accessibility issues.
6/4/2009	B4	**781930.684**	**146775.891**	**55.54**	JM04-B4(2.0)-060409	DPT	---	SM	Silty Sand with little clay, silt and clay are in zones with coarse angular sands, sand throughout is fine to very coarse grained, trace angular cobbles, dry, loose, light brown (5Y 7/6)	>30'	---
6/4/2009	B5	**781977.782**	**146761.991**	**52.03**	JM04-B5(2.0)-060409	DPT	---	ML	Sandy Silt, little clay, sand is fine grained to cobble, angular, ~40% sand, 50% silt, 10% clay, low plasticity, dry, brown (5Y 4/4)	>30'	---
6/4/2009	B6	**782025.433**	**146749.192**	**46.70**	JM04-B6(2.0)-060409	DPT	Field Duplicate	OH/ SW	Silty Clay top 4", organic, little sand, trace cobble, Sand bottom 20", fine to very coarse grained with trace angular cobble and trace fines, dry, brown (5Y 6/3)	>30'	---
6/4/2009	B7	**782072.620**	**146738.431**	**41.37**	JM04-B7(2.0)-060409	Hand Auger	---	CL	Silty Clay with sand and cobbles, sand is fine to very coarse, cobbles are angular, moderate moisture, 3 small specs of **asphalt/tar** located within the sample. dark brown (5Y 7/3)	>30'	Sample was not collected for PAH's due to the presence of Asphalt debris
6/4/2009	B8	**781913.149**	**146729.521**	**53.02**	JM04-B8(2.0)-060409	DPT	---	SM/ GW	Silty Sand with cobbles, sample is ~75% cobbles, angular, trace clays as matrix in very coarse sand (like a saprolite), dry, loose, light brown (5Y 7/4)	12' east	---
6/4/2009	B9	**781960.779**	**146718.079**	**53.75**	JM04-B9(2.0)-060409	DPT	---	ML/ SM	Sandy Silt - Silty Sand, trace clays, abundant angular gravel and cobble, dry, loose, light brown (5Y 7/3)	21' north	---
6/4/2009	B10	**782009.902**	**146707.200**	**54.51**	JM04-B10(2.0)-060409	DPT	MS/MSD	ML/ SM	Sandy Silt - Silty Sand, with cobbles, angular, ~50% cobbles, low moisture, loose, light brown (5Y 7/3)	12' north	---
6/4/2009	B11	**782058.597**	**146695.129**	**55.62**	JM04-B11(2.0)-060409	DPT	---	ML	Sandy Silt with Cobbles	13' north	---
6/4/2009	B12	**782106.736**	**146684.457**	**56.14**	JM04-B12(2.0)-060409	DPT	Field Duplicate	ML	Sandy Silt with cobbles, trace clay, ~40% cobbles, angular, sand is fine to medium grained, little course to very coarse grained, moderate moisture, soft, low plasticity, low cohesiveness, dark brown (10YR 4/3)	13' north	---
6/4/2009	B13	**781851.323**	**146686.101**	**50.79**	JM04-B13(2.0)-060409	DPT	---	GW/ SM	Angular Cobbles with silty sand and fill sand, mostly fine grained, some medium to coarse grained and gravel, low moisture, loose, light brown (5Y 7/4)	20' west	---
6/4/2009	B14	**781900.206**	**146679.898**	**51.02**	JM04-B14(2.0)-060409	DPT	---	SM/GW	Silty Sand with cobbles, top 2" are organic clay, sand is fine grained to very coarse, angular with abundant gravel and cobble, dry, loose, light brown (5Y7/3)	12' north, 18' east	---
6/4/2009	B15	**781946.544**	**146672.126**	**51.37**	JM04-B15(2.0)-060409	DPT	---	ML	Sandy Silt with cobbles, little clay, ~65% silts, cobbles are angular, low moisture, low plasticity, low cohesiveness, dark brown (10YR 4/3)	>30'	---
--	B16	---	---	---	NA	---	---	---	---	---	---
--	B17	---	---	---	NA	---	---	---	---	---	---
6/4/2009	B18	**781837.431**	**146638.485**	**49.69**	JM04-B18(2.0)-060409	DPT	---	SM	Silty Sand with cobbles and gravel, sand is fine to very coarse grained, dry, loose, light brown (5YR 7/3)	30' west	---
6/4/2009	B19	**781886.787**	**146631.536**	**47.89**	JM04-B19(2.0)-060409	DPT	---	SM	Silty Sand with cobbles, fine to very coarse grained, cobbles are angular, dry, loose, light brown (5Y 7/3)	7' east, 33' south	---
--	B20	---	---	---	NA	---	---	---	---	---	---
--	B21	---	---	---	NA	---	---	---	---	---	---
6/4/2009	B22	**781851.968**	**146579.025**	**44.97**	JM04-B22(2.0)-060409	DPT	---	SM	Silty Sand with gravel and cobbles, 4" thick zone of SP fill sand near top, gravel is angular, fine to coarse grained, low moisture, loose, light brown (5Y 7/3)	9' west	---
6/4/2009	B23	**781880.131**	**146582.390**	**44.35**	JM04-B23(2.0)-060409	DPT	---	SM	Silty Sand with gravel and cobbles, 4" thick zone of SP fill sand near top, gravel is angular, fine to coarse grained, low moisture, loose, light brown (5Y 7/3)	9' east	---
6/4/2009	B24	782014.460	146858.756	60.37	JM04-B24(2.0)-060409	DPT	---	OH/ SW	Silty Clay, top 12", organic, trace cobble and coarse sands, angular, Sand, bottom 12", Fine to very coarse grained with some gravel and cobble, dry, loose, light brown (5Y6/3)	>30'	---

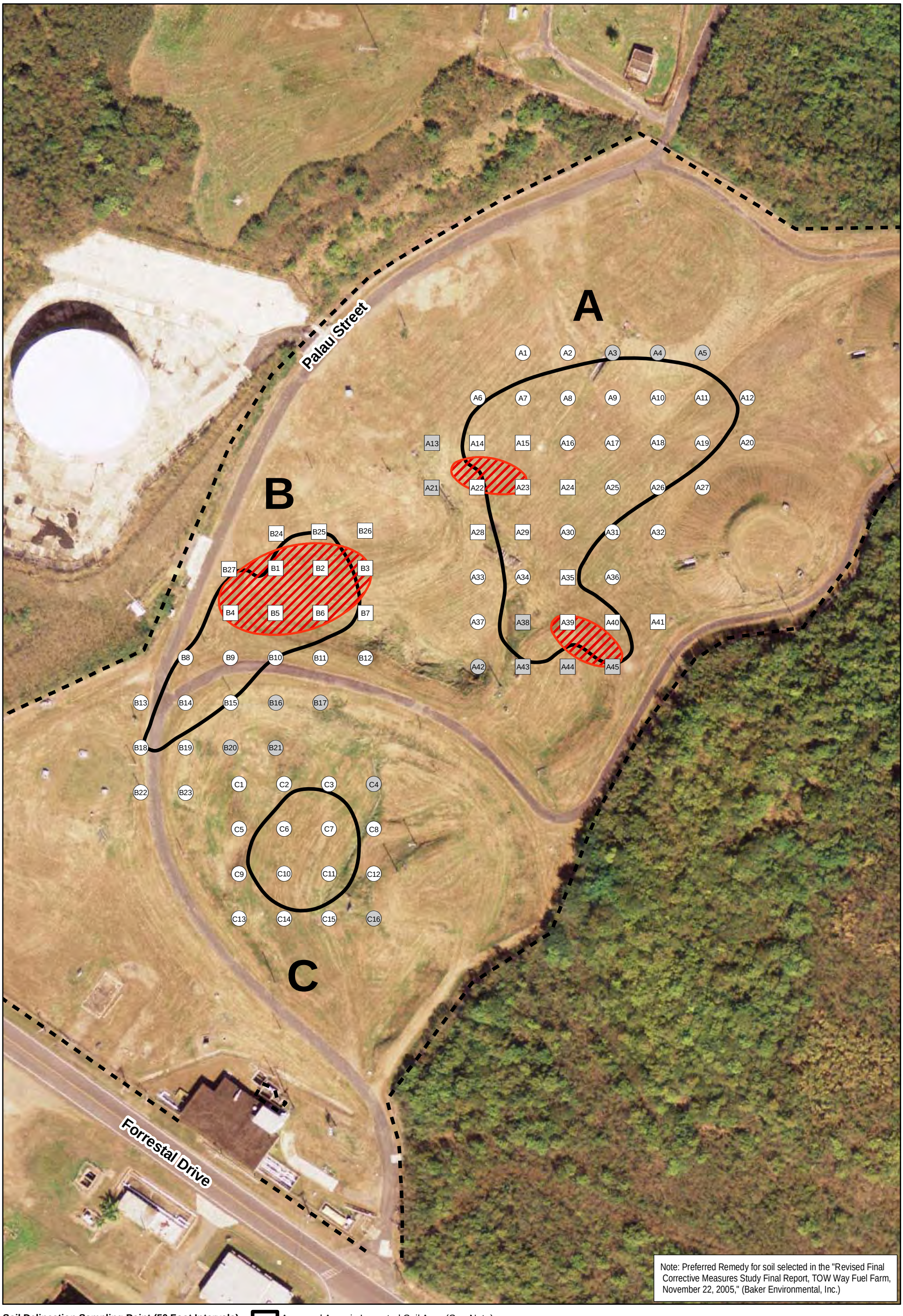
Table 2-1
Pre-Excavation Soil Delineation Sample Summary at SWMU 7/8 (June 2009)
Roosevelt Roads Naval Station, Puerto Rico

Sample Date	Station ID	Coordinates		Elevation	Sample ID	Sample method	Quality Control	USCS	Description	Proximity to existing Asphalt	Other notes
		Easting	Northing	feet NGVD 29							
6/4/2009	B25	782060.177	146841.826	52.82	JM04-B25(2.0)-060409	DPT	---	CL/ SW	Silty Clay, top 8", moderate moist, trace angular cobble, low to medium plasticity, dark brown (10YR 4/3) Sand, bottom 16", well graded, find to cobble, angular, few fines (<25%), dry, light brown (5Y 6/3)	>30'	---
6/4/2009	B26	**782106.018**	**146825.561**	**50.28**	JM04-B26(2.0)-060409	DPT	---	OH/ SP	Clay, Top 1,' organic high plasticity, moderate moisture , Sand bottom 1' fine grained with little cobble, possibly dirty fill sand, dry, dark brown to light gray (5Y3/2) & (5Y 7/1)	>30'	---
6/4/2009	B27	**781952.770**	**146827.819**	**58.62**	JM04-B27(2.0)-060409	DPT	---	SM	Silty Sand with little clay, clay is near bottom of sample as matrix in gravelly cobbly layer, sand is fine to very coarse grained, angular, ~30% silt, ~10% clay, dry, light brown (5Y 7/3)	>30'	---
6/1/2009	C1	**781950.281**	**146563.206**	**19.37**	JM04-C1(2.0)-060109	DPT	---	SM/ ML	Angular cobbles, topsoil, silt, ~50% sand, dry, light brown	>30'	---
6/1/2009	C2	**781998.953**	**146572.770**	**20.63**	JM04-C2(2.0)-060109	DPT	---	SW/ CL	Angular cobbles, sand, fine to cobble, dry, silty clay last 2 inches, light brown	>30'	---
6/1/2009	C3	**782048.769**	**146582.975**	**22.96**	JM04-C3(2.0)-060109	DPT	---	SW	Silty Sand, trace fines, angular, dry, light brown	>30'	---
--	C4	---	---	---	NA	---	---	---	---	---	---
6/1/2009	C5	**781961.084**	**146514.491**	**17.91**	JM04-C5(2.0)-060109	DPT	---	CL	2" gravel then Silty-Clay, trace gravel, low moisture, dark brown	>30'	---
6/1/2009	C6	**782009.998**	**146524.016**	**20.28**	JM04-C6(2.0)-060109	DPT	---	SW	Sand, fine to cobble, angular, trace silts and clays, dry, loose, light brown	>30'	---
6/1/2009	C7	**782053.193**	**146533.603**	**22.56**	JM04-C7a(2.0)-060109	DPT	---	SW	Silty Sand, fine to cobble, angular, dry, light brown	>30'	Sample location moved 5 feet north to allow for utilities.
6/1/2009	C8	**782100.448**	**146544.007**	**24.06**	JM04-C8a(2.0)-060109	DPT	---	OL	Silty Clay, stiff, trace cobbles, moderate moisture, organic, dark brown	>30'	Sample location moved 5 feet west to allow for utilities.
6/1/2009	C9	**781971.316**	**146465.569**	**18.17**	JM04-C9(2.0)-060109	DPT	---	OL/SP	0-1' = Clay with some silt, stiff, moderate moist, organic, dark brown 1-2' = Fill Sand mixed with gravel, loose, dry, light brown	>30'	---
6/1/2009	C10	**782020.260**	**146475.443**	**19.50**	JM04-C10(2.0)-060109	DPT	---	SP	Fill Sand, trace fines near top, some gravel, light yellow-brown	>30'	---
6/1/2009	C11	**782068.854**	**146484.252**	**21.39**	JM04-C11(2.0)-060109	DPT	---	ML/ SP	Sandy Silt, then fill sand, sand is fine grained and subround, light brown	>30'	---
6/1/2009	C12	**782117.203**	**146493.683**	**28.24**	JM04-C12(2.0)-060109	Hand Auger	---	SM	Silty Sand with cobbles, moderate moist to dry, light to dark brown	>30'	Sample collected with hand auger due to accessibility issues.
6/1/2009	C13	**781978.282**	**146425.766**	**17.88**	JM04-C13a(2.0)-060109	DPT	---	SW	Sand, cobbly, angular, trace fines, trace organics, dry, light brown	>30'	Moved 5 feet to the north to allow for utilities
6/1/2009	C14	**782029.473**	**146426.044**	**16.67**	JM04-C14(2.0)-060109	DPT	---	SM	Silty Sand, some clays, some cohesiveness, fine to very course sand, trace cobbles, loose, dry, light brown	>30'	---
6/1/2009	C15	**782066.731**	**146433.122**	**15.46**	JM04-C15(2.0)-060109	Hand Auger	Field Duplicate	SM	Silty Sand, cobbles and organics, sand is fine grained to cobble, angular, low moisture, loose, light brown,	>30'	Sample collected with hand auger due to accessibility issues.
--	C16	---	---	---	NA	---	---	---	---	---	---

Notes:
--- = no data collected
DPT = direct push technology
NA = not accessible
PAH = Poly Aromatic Hydrocarbon
USCS = United Soil Classification System

USCS Details

First and/or Second Letter	Second Letter
G = Gravel	P = Poorly Graded
S = Sand	W = Well Graded
M = Silt	H = High Plasticity
C = Clay	L = Low Plasticity
O = Organic	



Soil Delineation Sampling Point (50 Foot Intervals)

- Arsenic
- Arsenic and PAHs

PAHs = Benzo(a)anthracene
Benzo(a)Pyrene
Benzo(a) fluoranthene
Benzo(1,2,3-cd)Pyrene

Grayed sample locations indicate areas where samples cannot be collected due to topography or existing structures

- Assumed Arsenic Impacted Soil Area (See Note)
- Fence
- PAH Excavation Area

N

0 50 100 Feet

1 inch = 100 feet

FIGURE 2-1

Proposed Soil Delineation Sample Locations
Tow Way Fuel Farm
Naval Station Roosevelt Roads, Puerto Rico

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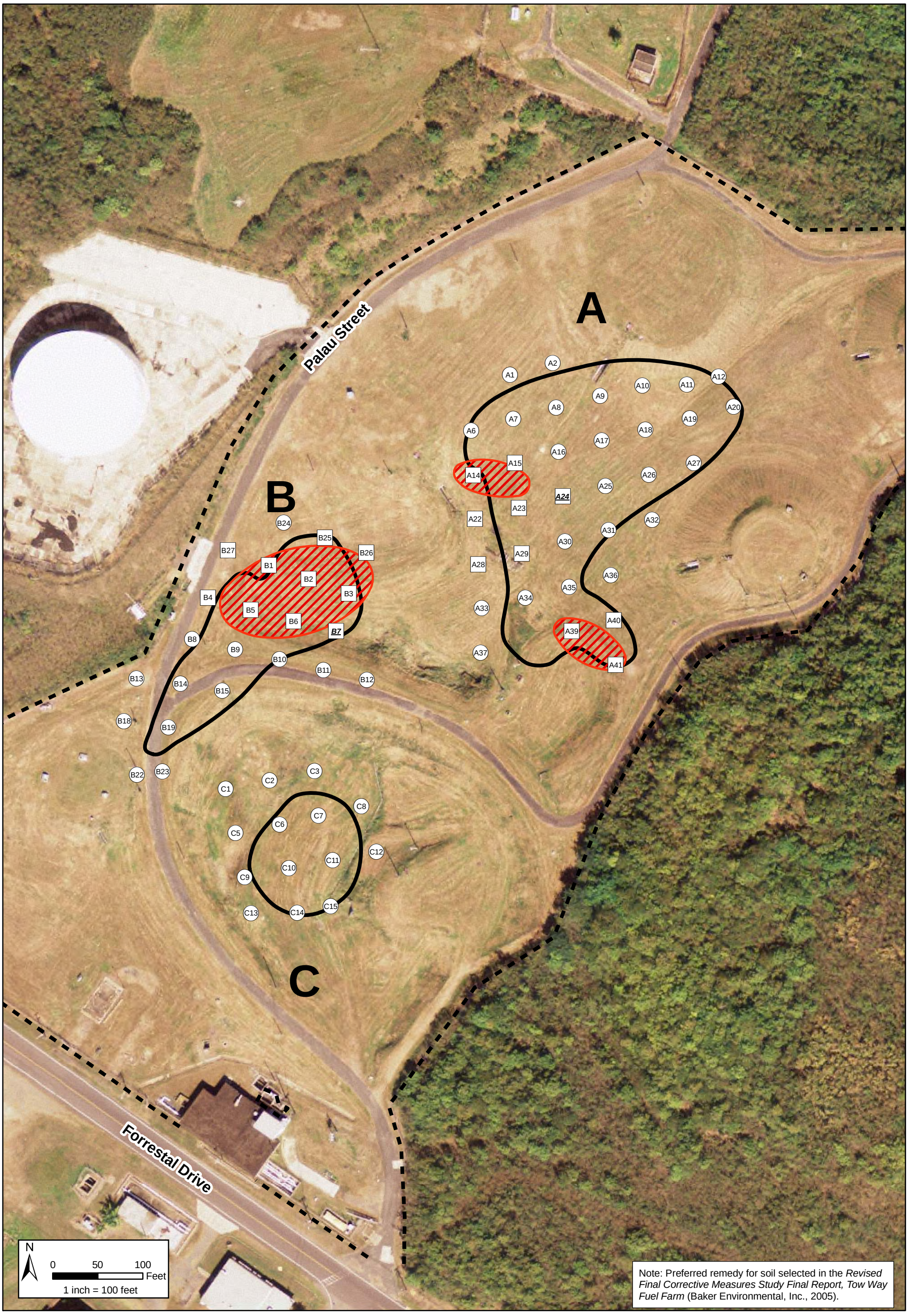

Note: Preferred remedy for soil selected in the *Revised Final Corrective Measures Study Final Report, Tow Way Fuel Farm* (Baker Environmental, Inc., 2005).

Soil Delineation Sampling Point

- Arsenic
- Arsenic and Polynuclear Aromatic Hydrocarbons (PAHs)
- Fence
- Assumed Arsenic Impacted Soil Area (See Note)
- PAH Excavation Area (See Note)

PAHs = Benzo(a)anthracene
Benzo(a)Pyrene
Benzo(a) fluoranthene
Benzo(1,2,3-cd)Pyrene

A24 = Asphalt present in soil sample. Sample only tested for arsenic.

FIGURE 2-2
Soil Delineation Sample Locations
Tow Way Fuel Farm
Naval Station Roosevelt Roads, Puerto Rico

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3.0 Discussion of Results

Analytical results are summarized in Table 3-1, and the laboratory reports are included in Appendix A. Data for the analyses were reviewed for adherence to the analytical protocols presented in the approved UFP-SAP and WP. All analytical results were validated or qualified by a Puerto Rican chemist, an AGVIQ-CH2M HILL certified chemist, and a third party validator in accordance with the guidance provided in the Department of Defense Quality Systems Manual - Version 3 Final (based on National Environmental Laboratory Accreditation Conference Voted Version 5 – June 2003) presented in the UFP-SAP.

3.1 PAH

A total of 18 samples were collected and analyzed for PAH compounds (benzo(a)-anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene). PAHs were not detected in the upper 2 feet of soil. PAH results are summarized on Table 3-1 and sample locations are illustrated on Figure 2-2.

3.2 Arsenic

A total of 72 samples were collected and analyzed for arsenic. Arsenic was detected in 69 of the 72 samples at concentrations ranging from 0.81J (C2) to 4.3 mg/kg (B23). Of the 69 samples collected, arsenic was detected above the CAO of 2.65 milligrams per kilogram (mg/kg) in the following nine borings: A30, B9, B14, B23, B26, C3, C7, C9, and C12. Arsenic results are summarized on Table 3-1 and Figure 3-1 highlights the sample locations where arsenic exceeded the CAO of 2.65 mg/kg.

Baker developed a CAO for arsenic based on a statistical estimate using the analytical results from 21 "background" surface soil samples collected in areas that exhibited limited disturbance as a result of Navy Operations. Areas of "limited disturbance" were defined by the presence of native flora and fauna (Baker, 2006). The samples collected by Baker had arsenic concentrations ranging between non-detect (ND) and 3.4 mg/kg (Baker, 1997 and Baker, 2005). During the recent sampling work performed by AGVIQ-CH2M HILL (72 samples versus 21 samples), arsenic concentrations ranged from 0.81J to 4.3 mg/kg. AGVIQ-CH2M HILL calculated the average and median arsenic concentrations to be 1.9 mg/kg and 1.8 mg/kg, respectively.

Published reports indicated that arsenic is a common naturally-occurring element present in soil on the island of Puerto Rico. A 2003 study performed by the Agency for Toxic Substances and Disease Registry (ASTDR) indicated arsenic occurs in soil on the island of Puerto Rico at concentrations ranging from 1 to 22 mg/kg (ATSDR, 2003). Arsenic is not a contaminant of fuel oils such as those formerly used at the TWFF, and no other metals were identified in Baker's work as a contaminant of concern.

Based on the limited test results used by Baker to calculate the CAO for arsenic, the fact that arsenic is a naturally occurring element in soil, and the evaluation of recent test results,

AGVIQ-CH2M HILL elected to perform a statistical evaluation using the larger data set to determine if soil excavation is necessary to remove arsenic. For the evaluation, AGVIQ-CH2M HILL compared the background sample results from the CMS against those obtained in June 2009. Arsenic results for soil within the TWFF were estimated for the upper-bound estimate of the mean (e.g., upper-bound confident limits at 95 percent [UCL95%]), and these values were compared against the UCL95% mean of the background arsenic to statistically evaluate whether arsenic is of natural origin or was introduced as a result of past naval activities. At locations where the UCL 95% for TWFF exceeds both UCL 95% background levels and the 2.65 mg/kg arsenic CAO, excavation will be necessary to remove the arsenic-impacted soil. However, if UCL95% values are below the CAO (also a statistically estimated value) excavation is not required.

Our evaluation of the arsenic data indicates the following:

- The detected concentrations in site soil indicated a range between 0.81J mg/kg to 4.3 mg/kg. Typically, larger data sets for naturally occurring inorganic chemicals such as the soil delineation data set which includes 72 sample locations, will have a greater variation and wider distribution in concentration ranges.
- The maximum detected concentration (4.3 mg/kg in location B23) is located adjacent to a roadway and away from former tank areas; the second highest concentration (detection of 4.1 mg/kg in location B26) is located in a separate area on the northern end of Area B. Both samples are separated by several samples with low arsenic levels. Based on the June 2009 analytical results, the detected arsenic is randomly distributed across the site (Figure 3-1).
- The highest levels of arsenic are detected in samples located outside of the CMS designated source areas (indicated as Areas A, B, and C on Figure 3-1).
- Overall distribution of arsenic across the three areas of concern is random and does not indicate a distinct distribution pattern; this distribution is most likely representative of soil mineralogy of the area and the fact that shallow bedrock was excavated and spread on the site during tank construction.
- The statistical estimation of the arsenic data calculated separately for Areas A, B, and C has a UCL95% ranging between 1.9 to 2.5 mg/kg (Table 3-2).
- The arsenic distribution is similar among the majority of samples collected across the site, with no elevated or "source" area. Thus, detected arsenic appears to be related to the natural soil variability due to mineralogy and does not indicate a site-specific release.
- The Q-Q plots of both normal and lognormal data presented in Figures 3-2 and 3-3 estimate correlation coefficient values (R2) of 0.914 (normal) and 0.987 (lognormal), which are substantially greater than 0.5. These R2 values indicate the arsenic data are well correlated between various samples and do not indicate a skewed distribution that is typical of site-specific releases.

- The maximum detected arsenic concentration of 4.3 mg/kg is not identified as a "hot spot," as it is below three times the target CAO value of 8.0 mg/kg (2.65 mg/kg * 3). Thus, no extremely elevated area is identified for arsenic at SWMU 7/8.
- The CAO selected for arsenic was based on the surface soil background level for arsenic of 2.65 mg/kg. The current comparable statistical value (UCL95%) value for arsenic is 2.5 mg/kg, indicating site arsenic levels are within background levels and do not exceed the surface soil CAO.

TABLE 3-1
Soil Delineation Analytical Results at SWMU 7/8 (June 2009)
Roosevelt Roads Naval Station, Puerto Rico

Station ID	Sample ID	Sample Depth feet	Arsenic mg/kg	Benzo (a) Anthracene mg/kg	Benzo (a) Pyrene mg/kg	Benzo (b) Fluoranthene mg/kg	Indeno (1,2,3-cd) Pyrene mg/kg
	CAOs in Surface Soil (mg/kg)*		***2.65***	***2.9***	***2.9***	***2.9***	***2.9***
A1	JM04-A1(2.0)-060309	0 - 2	**1.4J**	---	---	---	---
A2	JM04-A2(2.0)-060309	0 - 2	**1.6J**	---	---	---	---
A3	NA	---	---	---	---	---	---
A4	NA	---	---	---	---	---	---
A5	NA	---	---	---	---	---	---
A6	JM04-A6(2.0)-060309	0 - 2	**1.3J**	---	---	---	---
A7	JM04-A7(2.0)-060309	0 - 2	**1.1J**	---	---	---	---
A8	JM04-A8(2.0)-060309	0 - 2	**2.2J**	---	---	---	---
A9	JM04-A9(2.0)-060409	0 - 2	**1.4J**	---	---	---	---
A10	JM04-A10(2.0)-060409	0 - 2	2.5U	---	---	---	---
A11	JM04-A11(2.0)-060309	0 - 2	**1.7J**	---	---	---	---
A12	JM04-A12a(2.0)-060309	0 - 2	**1.6J**	---	---	---	---
A13	NA	---	---	---	---	---	---
A14	JM04-A14(2.0)-060309	0 - 2	**1J**	2.2UJ	2.2UJ	2.2UJ	2.2UJ
A15	JM04-A15(2.0)-060209	0 - 2	**1.7J**	2.2UJ	2.2UJ	2.2UJ	2.2UJ
A16	JM04-A16(2.0)-060209	0 - 2	**1.6J**	---	---	---	---
A17	JM04-A17(2.0)-060409	0 - 2	**2J**	---	---	---	---
A18	JM04-A18(2.0)-060409	0 - 2	**2.3J**	---	---	---	---
A19	JM04-A19(2.0)-060309	0 - 2	**2.4J**	---	---	---	---
A20	JM04-A20(2.0)-060309	0 - 2	**2.4J**	---	---	---	---
A21	NA	---	---	---	---	---	---
A22	JM04-A22(2.0)-060309	0 - 2	**1.7J**	2.0UJ	2.0UJ	2.0UJ	2.0UJ
A23	JM04-A23(2.0)-060309	0 - 2	**2.1J**	2.2UJ	2.2UJ	2.2UJ	2.2UJ
A24	JM04-A24(2.0)-060209	0 - 2	**1.2J**	Asphalt Present in Sample			
A25	JM04-A25(2.0)-060209	0 - 2	**2.4**	---	---	---	---
A26	JM04-A26(2.0)-060409	0 - 2	**2.1J**	---	---	---	---
A27	JM04-A27(2.0)-060409	0 - 2	**1.2J**	---	---	---	---
A28	JM04-A28(2.0)-060209	0 - 2	**1.9J**	2.4UJ	2.4UJ	2.4UJ	2.4UJ
A29	JM04-A29(2.0)-060209	0 - 2	**1.7J**	2.1UJ	2.1UJ	2.1UJ	2.1UJ
A30	JM04-A30(2.0)-060209	0 - 2	**3J**	---	---	---	---
A31	JM04-A31(2.0)-060209	0 - 2	**1.6J**	---	---	---	---
A32	JM04-A32(2.0)-060209	0 - 2	**1.7J**	---	---	---	---
A33	JM04-A33(2.0)-060209	0 - 2	**2.4J**	---	---	---	---
A34	JM04-A34(2.0)-060209	0 - 2	**1.4J**	---	---	---	---
A35	JM04-A35a(2.0)-060209	0 - 2	**1.9J**	---	---	---	---
A36	JM04-A36(2.0)-060209	0 - 2	**1.8J**	---	---	---	---
A37	JM04-A37(2.0)-060209	0 - 2	**1.5J**	---	---	---	---
A38	NA	---	---	---	---	---	---
A39	JM04-A39(2.0)-060209	0 - 2	**1.8J**	2.4UJ	2.4UJ	2.4UJ	2.4UJ
A40	JM04-A40(2.0)-060209	0 - 2	**1.7J**	1.9UJ	1.9UJ	1.9UJ	1.9UJ
A41	JM04-A41(2.0)-060209	0 - 2	**0.95J**	1.8UJ	1.8UJ	1.8UJ	1.8UJ

TABLE 3-1
Soil Delineation Analytical Results at SWMU 7/8 (June 2009)
Roosevelt Roads Naval Station, Puerto Rico

Station ID	Sample ID	Sample Depth feet	Arsenic mg/kg	Benzo (a) Anthracene mg/kg	Benzo (a) Pyrene mg/kg	Benzo (b) Fluoranthene mg/kg	Indeno (1,2,3-cd) Pyrene mg/kg
	CAOs in Surface Soil (mg/kg)*		***2.65***	***2.9***	***2.9***	***2.9***	***2.9***
A42	NA	---	---	---	---	---	---
A43	NA	---	---	---	---	---	---
A44	NA	---	---	---	---	---	---
A45	NA	---	---	---	---	---	---
B1	JM04-B1(2.0)-060409	0 - 2	2.6U	2.2UJ	2.2UJ	2.2UJ	2.2UJ
B2	JM04-B2(2.0)-060409	0 - 2	**1.7J**	2.1UJ	2.1UJ	2.1UJ	2.1UJ
B3	JM04-B3(2.0)-060409	0 - 2	**1.8J**	2.2UJ	2.2UJ	2.2UJ	2.2UJ
B4	JM04-B4(2.0)-060409	0 - 2	**1.3J**	2.0UJ	2.0UJ	2.0UJ	2.0UJ
B5	JM04-B5(2.0)-060409	0 - 2	**1.8J**	2.0UJ	2.0UJ	2.0UJ	2.0UJ
B6	JM04-B6(2.0)-060409	0 - 2	**1.9J**	2.2UJ	2.2UJ	2.2UJ	2.2UJ
B7	JM04-B7(2.0)-060409	0 - 2	**2.2J**	Asphalt Present in Sample			
B8	JM04-B8(2.0)-060409	0 - 2	**1.2J**	---	---	---	---
B9	JM04-B9(2.0)-060409	0 - 2	**2.7**	---	---	---	---
B10	JM04-B10(2.0)-060409	0 - 2	**2.1J**	---	---	---	---
B11	JM04-B11(2.0)-060409	0 - 2	**1.5J**	---	---	---	---
B12	JM04-B12(2.0)-060409	0 - 2	**2.1J**	---	---	---	---
B13	JM04-B13(2.0)-060409	0 - 2	2.3U	---	---	---	---
B14	JM04-B14(2.0)-060409	0 - 2	**2.8**	---	---	---	---
B15	JM04-B15(2.0)-060409	0 - 2	**1.3J**	---	---	---	---
B16	NA	---	---	---	---	---	---
B17	NA	---	---	---	---	---	---
B18	JM04-B18(2.0)-060409	0 - 2	**1.5J**	---	---	---	---
B19	JM04-B19(2.0)-060409	0 - 2	**1.8J**	---	---	---	---
B20	NA	---	---	---	---	---	---
B21	NA	---	---	---	---	---	---
B22	JM04-B22(2.0)-060409	0 - 2	**1.5J**	---	---	---	---
B23	JM04-B23(2.0)-060409	0 - 2	**4.3**	---	---	---	---
B24	JM04-B24(2.0)-060409	0 - 2	**1.5J**	---	---	---	---
B25	JM04-B25(2.0)-060409	0 - 2	**1.2J**	1.9UJ	1.9UJ	1.9UJ	1.9UJ
B26	JM04-B26(2.0)-060409	0 - 2	**4.1**	2.3UJ	2.3UJ	2.3UJ	2.3UJ
B27	JM04-B27(2.0)-060409	0 - 2	**1.9J**	2.0UJ	2.0UJ	2.0UJ	2.0UJ
C1	JM04-C1(2.0)-060109	0 - 2	**2.2J**	---	---	---	---
C2	JM04-C2(2.0)-060109	0 - 2	**0.81J**	---	---	---	---
C3	JM04-C3(2.0)-060109	0 - 2	**2.8**	---	---	---	---
C4	NA	---	---	---	---	---	---
C5	JM04-C5(2.0)-060109	0 - 2	**1.9J**	---	---	---	---
C6	JM04-C6(2.0)-060109	0 - 2	**2.3**	---	---	---	---
C7	JM04-C7a(2.0)-060109	0 - 2	**3.2**	---	---	---	---
C8	JM04-C8a(2.0)-060109	0 - 2	**2J**	---	---	---	---
C9	JM04-C9(2.0)-060109	0 - 2	**3**	---	---	---	---
C10	JM04-C10(2.0)-060109	0 - 2	**1.7J**	---	---	---	---
C11	JM04-C11(2.0)-060109	0 - 2	**1.7J**	---	---	---	---

TABLE 3-1
Soil Delineation Analytical Results at SWMU 7/8 (June 2009)
Roosevelt Roads Naval Station, Puerto Rico

Station ID	Sample ID	Sample Depth feet	Arsenic mg/kg	Benzo (a) Anthracene mg/kg	Benzo (a) Pyrene mg/kg	Benzo (b) Fluoranthene mg/kg	Indeno (1,2,3-cd) Pyrene mg/kg
	CAOs in Surface Soil (mg/kg)*		***2.65***	***2.9***	***2.9***	***2.9***	***2.9***
C12	JM04-C12(2.0)-060109	0 - 2	**2.9**	---	---	---	---
C13	JM04-C13a(2.0)-060109	0 - 2	**1.6J**	---	---	---	---
C14	JM04-C14(2.0)-060109	0 - 2	**1.8J**	---	---	---	---
C15	JM04-C15(2.0)-060109	0 - 2	**2.5J**	---	---	---	---
C16	NA	---	---	---	---	---	---

--- = No data collected

NA = not accessible

J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

Bold indicates the analyte was detected

Shading indicates the analyte exceeded screening criteria

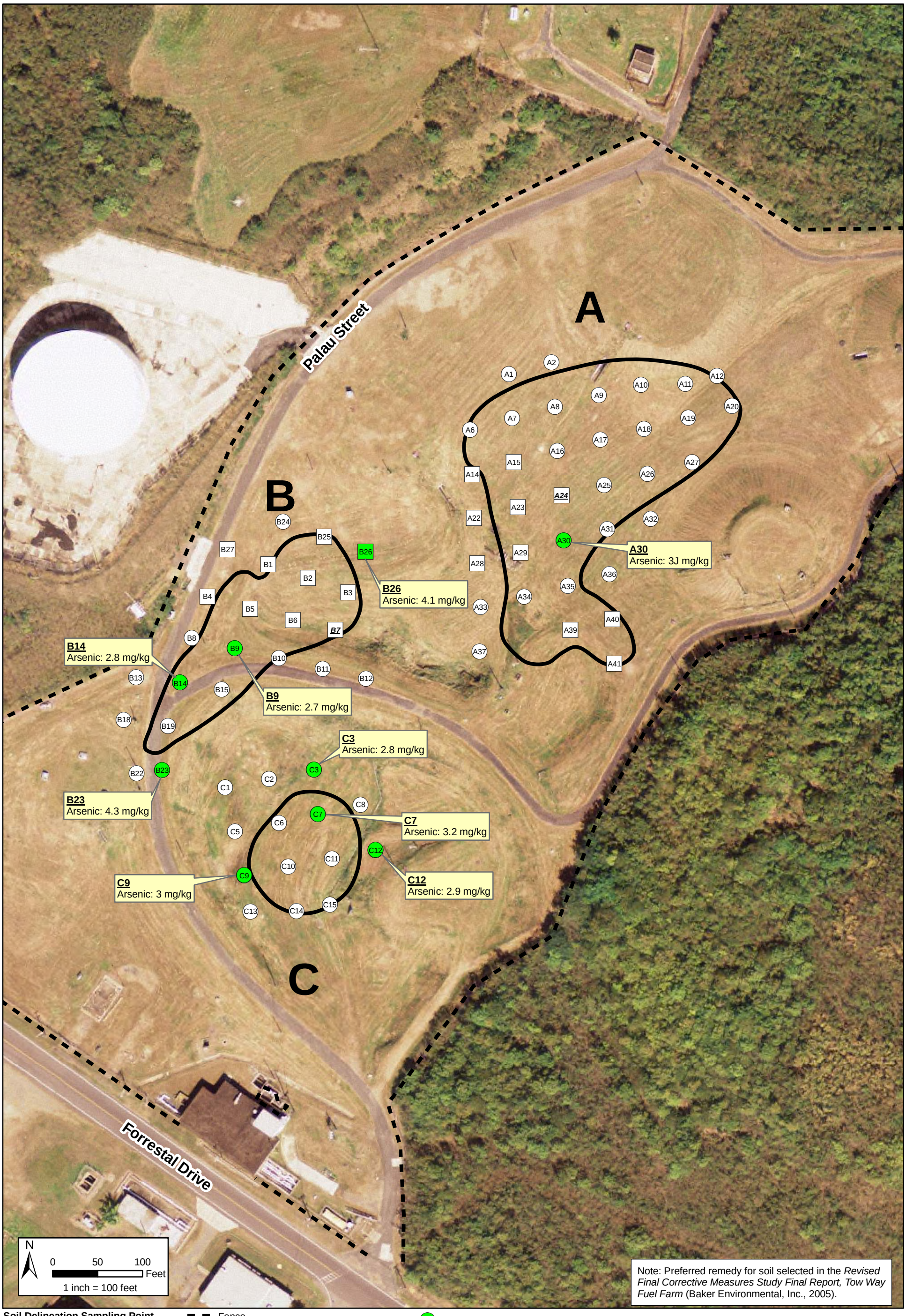
* Screening Levels obtained from "Revised Final Corrective Measures Study Final Report", November 22, 2005 (Table 1-1)

TABLE 3-2
Data Summary for Areas A, B, and C at SWMU7/8

Area	N of Samples	N of Detects	Min	Max	Mean	Data Distribution	UCL95%
Area A	35	34	0.95	3	1.8	95% KM (t) UCL	1.9
Area B	23	21	1.2	4.3	2.0	95% KM (BCA) UCL	2.2
Area C	14	14	0.81	3.2	2.2	95% Student's-t UCL	2.5
All (A,B&C)	72	69	0.81	4.3	1.9	95% KM (BCA) UCL	2.0

Note:

The estimated UCL95% levels are less than the target CAO of 2.65 mg/kg.



Soil Delineation Sampling Point

- Arsenic
- Arsenic and Polynuclear Aromatic Hydrocarbons (PAHs)
- Fence
- Assumed Arsenic Impacted Soil Area (See Note)

B14 = Soil sample with concentrations (in milligrams per kilogram [mg/kg]) above Corrective Action Objective (CAO):
Arsenic: 2.65 mg/kg
J = Estimated Detected Concentration

A24 = Asphalt present in soil sample. Sample only tested for arsenic.

FIGURE 3-1
Soil Delineation Sample Locations that Exceeded the Arsenic CAO
Tow Way Fuel Farm
Naval Station Roosevelt Roads, Puerto Rico

CH2MHILL

\\GALILEO\PROJ\USNAVY\378718_PUERTORICO\MAPFILES\DELINEATIONSAMPLES-EXCEEDSARSENIC.MXD SSMITH21 8/3/2009 17:07:05

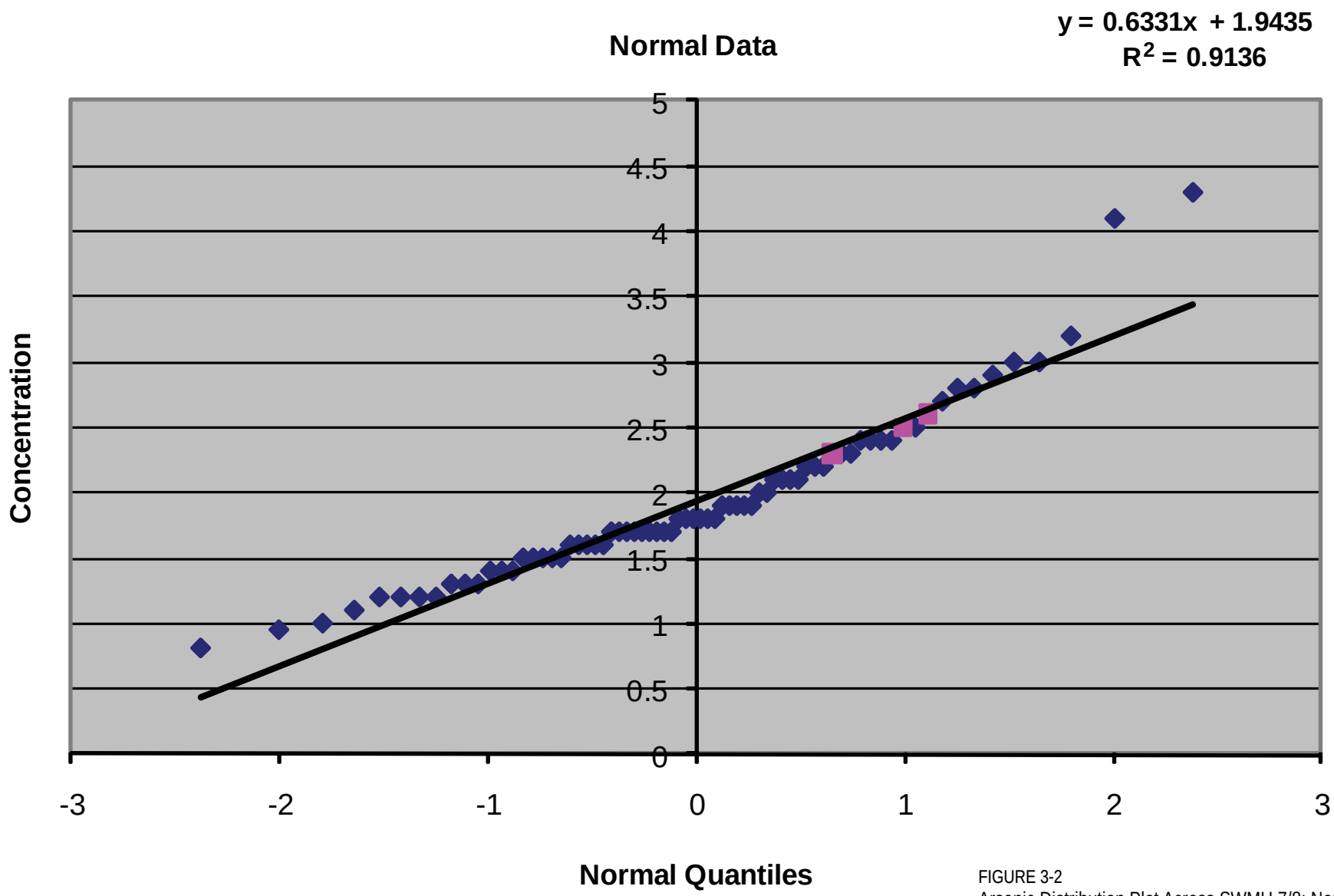


FIGURE 3-2
Arsenic Distribution Plot Across SWMU 7/8: Normal Data
Tow Way Fuel Farm
Naval Station Roosevelt Roads, Puerto Rico

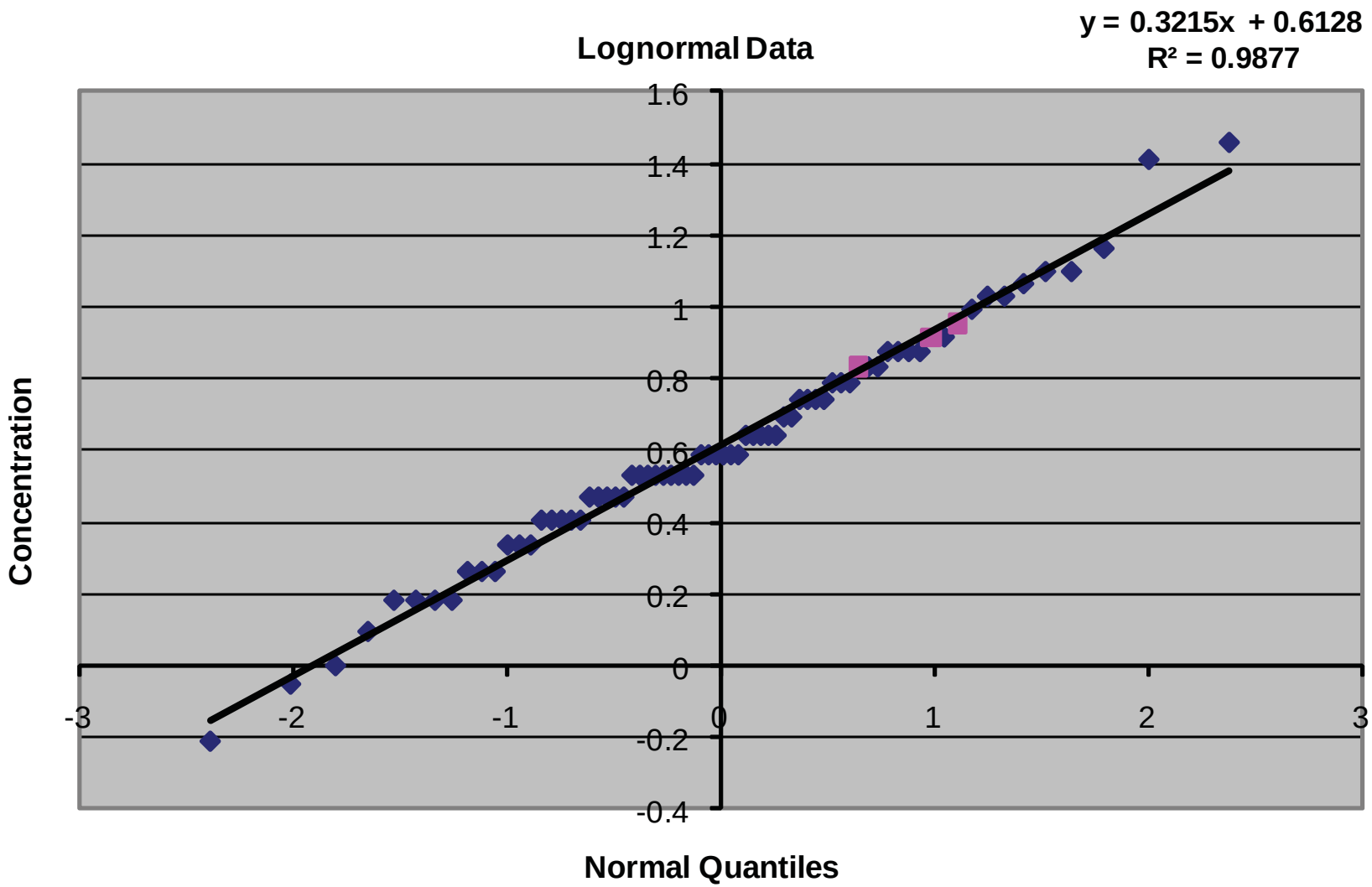


FIGURE 3-3
Arsenic Distribution Plot Across SWMU 7/8: Lognormal Data
Tow Way Fuel Farm
Naval Station Roosevelt Roads, Puerto Rico

4.0 Conclusions and Recommendations

4.1 Conclusions

Based on the field and analytical data collected from the SWMU 7/8 area, the following conclusions were made:

- PAHs were not detected in the upper 2 feet in the areas of concern indicated by the CMS.
- Arsenic was detected across the site in 69 out of 72 surface soil samples. However, results of a statistical evaluation indicate the current comparable statistical value (UCL95%) for arsenic is 2.5 mg/kg. Therefore, site arsenic levels are within background levels and are below the CAO of 2.65 mg/kg.

4.2 Recommendations

Based on the analytical results for the surface soil samples, there is no soil contamination at the site that requires corrective actions. PAH concentrations are below detection limits and do not present human or ecological exposure concern. Therefore, no further action at SWMU 7/8 is recommended for PAHs in site soils.

Based on the extensive sampling conducted across the site, detected arsenic is randomly distributed across the site. The distribution patterns indicate absence of specific elevated areas, and statistical evaluation of the data indicate site arsenic upper-bound estimates are between 1.9 mg/kg and 2.5 mg/kg, which are below the CAO target level of 2.65 mg/kg. No single detection is indicative of extremely elevated values. Therefore, the detected arsenic levels at SWMU 7/8 are considered naturally occurring within the surface soil and no further action is recommended for arsenic in site soils.

5.0 References

Agency for Toxic Substances and Disease Registry (ATSDR). 2003. *Petitioned Public Health Assessment, Soil Pathway Evaluation, Isla De Vieques Bombing Range, Vieques*, P.R. February 7.

Baker Environmental, Inc. 1997. *Revised Draft RCRA Facility Investigation for Operable Unit 2 (SWMU 7/8).* June 16.

Baker Environmental, Inc. 2005. *Revised Final CMS Final Report for TWFF*. November 22.

Baker Environmental, Inc. 2006. *Revised Final Summary Report for Environmental Background Concentrations of Inorganic Compounds*. October 17.

United States environmental Protection Agency (EPA) 1992. *Preparation of Soil Sampling Protocols: Sampling Techniques and Strategies.* Office of Research and Development, Washington, D.C. EPA/600/R-92/128.

APPENDIX A

Soil Laboratory Analytical Results

NA Puerto Rico

PREPARED FOR:	NA Puerto Rico / SWMU 7 and 8 Soil Delineation
FINAL REVIEWER/ INITIAL REVIEWER	Camden Robinson/ Associate Project Chemist/CH2M Hill
COPIES:	Tom Beisel /Project Manager/AGVIQ-CH2M HILL
DATE:	July 17, 2009
SUBJECT:	Quality Assessment for Samples Collected June 1st, 2009 thru June 4th, 2009

This quality assurance memorandum is based upon a review of analytical data generated for the soil samples and the associated field quality control samples collected June 1st, 2009 thru June 4th, 2009 at the Naval Activity Puerto Rico in Ceiba, Puerto Rico. The samples were collected as a part of the SWMU 7 and 8 Soil Delineation sampling event conducted at the site. Table 1-1 presents a summary of the AGVIQ-CH2M HILL sample identification numbers, laboratory sample identification numbers, dates of collection, and the analyses performed.

Empirical Laboratories, LLC. of Nashville, Tennessee served as the laboratory for this SWMU 7 and 8 Soil Delineation sampling event. The samples were submitted for Select Polycyclic aromatic Hydrocarbons by SW-846 method 8270C (PAH) and Arsenic by SW-846 6010B.

Data for the analyses were reviewed for adherence to the specified analytical protocols in accordance with AQVIQ-CH2M HILL Sampling Analysis Plan. All analysis results have been validated or qualified according to general guidance provided in the Department of Defense (DOD) Quality Systems Manual - Version 3 Final (based on NELAC Voted Version 5 – June 2003).

The findings of this quality assurance report are based upon the comprehensive review of the following results summaries reported according to the AGVIQ-CH2M HILL Level C (CLP-like data deliverables format): chain of custody documentation, holding times, laboratory method and field blank analyses, surrogate compound recoveries, matrix spike compound recoveries and reproducibility, bromofluorobenzene (BFB) mass tuning results, initial and continuing calibration, second source recovery and internal standard area performance summaries, target compound identification, laboratory control sample results, laboratory and blind field duplicate sample results, detection limits/sensitivity, ICP interference check sample results, ICP serial dilution results, metals post digestion spikes, and electronic data deliverables.

The analyses were performed acceptably, but require several qualifying statements; it is recommended that the analytical data be used only with the qualifying statements provided below. Any aspects of the data, which are not discussed in this report, should be considered qualitatively and quantitatively valid as reported, based on the deliverables reviewed. The validated and qualified results are presented in the data summary tables. Attachment A contains a copy of the chain of custody and the validated sample results.

Table 1-1
Summary Sample Data
NA Puerto Rico

Sample Number	Reference Sample Number	Lab Sample ID	Date Sampled	Analyses Required
JM04-A1(2.0)-060309		0906068-01	06/03/2009	[2]
JM04-A2(2.0)-060309		0906068-02	06/03/2009	[2]
JM04-A6(2.0)-060309		0906068-03	06/03/2009	[2]
JM04-A7(2.0)-060309		0906068-04	06/03/2009	[2]
JM04-A8(2.0)-060309		0906068-05	06/03/2009	[2]
JM04-A8FD(2.0)-060309	JM04-A8(2.0)-060309	0906068-06	06/03/2009	[2]
JM04-A9(2.0)-060409		0906068-07	06/04/2009	[2]
JM04-A10(2.0)-060409		0906068-08	06/04/2009	[2]
JM04-A11(2.0)-060309		0906068-09	06/03/2009	[2]
JM04-A12A(2.0)-060309		0906068-10	06/03/2009	[2]
JM04-A14(2.0)-060309		0906068-11	06/03/2009	[1], [2]
JM04-A15(2.0)-060209		0906068-12	06/02/2009	[1], [2]
JM04-A16(2.0)-060209		0906068-13	06/02/2009	[2]
JM04-A16FD(2.0)-060209	JM04-A16(2.0)-060209	0906068-14	06/02/2009	[2]
JM04-A17(2.0)-060409		0906068-15	06/04/2009	[2]
JM04-A18(2.0)-060409		0906068-16	06/04/2009	[2]

Sample Number	Reference Sample Number	Lab Sample ID	Date Sampled	Analyses Required
JM04-A19(2.0)-060309		0906068-17	06/03/2009	[2]
JM04-A20(2.0)-060309		0906068-18	06/03/2009	[2]
JM04-A22(2.0)-060309		0906068-19	06/03/2009	[1], [2]
JM04-A22FD(2.0)-060309	JM04-A22(2.0)-060309	0906068-20	06/03/2009	[1], [2]
JM04-A23(2.0)-060309		0906068-21	06/03/2009	[1], [2]
JM04-A24(2.0)-060209		0906068-22	06/02/2009	[1], [2]
JM04-A25(2.0)-060209		0906068-23	06/02/2009	[2]
JM04-A25FD(2.0)-060209	JM04-A25(2.0)-060209	0906068-24	06/02/2009	[2]
JM04-A26(2.0)-060409		0906068-25	06/04/2009	[2]
JM04-A27(2.0)-060409		0906068-26	06/04/2009	[2]
JM04-EB03-060309		0906068-27	06/03/2009	[2]
JM04-EB04-060409		0906068-28	06/04/2009	[1]
JM04-A28(2.0)-060209		0906069-01	06/02/2009	[1], [2]
JM04-A29(2.0)-060209		0906069-02	06/02/2009	[1], [2]
JM04-A30(2.0)-060209		0906069-03	06/02/2009	[2]
JM04-A31(2.0)-060209		0906069-04	06/02/2009	[2]
JM04-A32(2.0)-060209		0906069-05	06/02/2009	[2]

Sample Number	Reference Sample Number	Lab Sample ID	Date Sampled	Analyses Required
JM04-A33(2.0)-060209		0906069-06	06/02/2009	[2]
JM04-A34(2.0)-060209		0906069-07	06/02/2009	[2]
JM04-A35(2.0)-060209		0906069-08	06/02/2009	[1], [2]
JM04-A36(2.0)-060209		0906069-09	06/02/2009	[2]
JM04-A37(2.0)-060209		0906069-10	06/02/2009	[2]
JM04-A39(2.0)-060209		0906069-11	06/02/2009	[1], [2]
JM04-A40(2.0)-060209		0906069-12	06/02/2009	[1], [2]
JM04-A41(2.0)-060209		0906069-13	06/02/2009	[1], [2]
JM04-B1(2.0)-060409		0906069-14	06/04/2009	[1], [2]
JM04-B2(2.0)-060409		0906069-15	06/04/2009	[1], [2]
JM04-B3(2.0)-060409		0906069-16	06/04/2009	[1], [2]
JM04-B3FD(2.0)-060409	JM04-B3(2.0)-060409	0906069-17	06/04/2009	[1], [2]
JM04-B4(2.0)-060409		0906069-18	06/04/2009	[1], [2]
JM04-EB02-060209		0906069-27	06/02/2009	[1], [2]
JM04-B12(2.0)-060409		0906071-01	06/04/2009	[2]
JM04-B12FD(2.0)-060409	JM04-B12(2.0)-060409	0906071-02	06/04/2009	[2]
JM04-B13(2.0)-060409		0906071-03	06/04/2009	[2]

Sample Number	Reference Sample Number	Lab Sample ID	Date Sampled	Analyses Required
JM04-B14(2.0)-060409		0906071-04	06/04/2009	[2]
JM04-B15(2.0)-060409		0906071-05	06/04/2009	[2]
JM04-B18(2.0)-060409		0906071-06	06/04/2009	[2]
JM04-B19(2.0)-060409		0906071-07	06/04/2009	[2]
JM04-B22(2.0)-060409		0906071-08	06/04/2009	[2]
JM04-B23(2.0)-060409		0906071-09	06/04/2009	[2]
JM04-B24(2.0)-060409		0906071-10	06/04/2009	[1], [2]
JM04-B25(2.0)-060409		0906071-11	06/04/2009	[1], [2]
JM04-B26(2.0)-060409		0906071-12	06/04/2009	[1], [2]
JM04-B27(2.0)-060409		0906071-13	06/04/2009	[1], [2]
JM04-C1(2.0)-060109		0906071-14	06/01/2009	[2]
JM04-C2(2.0)-060109		0906071-15	06/01/2009	[2]
JM04-C3(2.0)-060109		0906071-16	06/01/2009	[2]
JM04-C5(2.0)-060109		0906071-17	06/01/2009	[2]
JM04-C6(2.0)-060109		0906071-18	06/01/2009	[2]
JM04-C7A(2.0)-060109		0906071-19	06/01/2009	[2]
JM04-C8A(2.0)-060109		0906071-20	06/01/2009	[2]

Sample Number	Reference Sample Number	Lab Sample ID	Date Sampled	Analyses Required
JM04-C9(2.0)-060109		0906071-21	06/01/2009	[2]
JM04-C10(2.0)-060109		0906071-22	06/01/2009	[2]
JM04-C11(2.0)-060109		0906071-23	06/01/2009	[2]
JM04-C12(2.0)-060109		0906071-24	06/01/2009	[2]
JM04-C13A(2.0)-060109		0906071-25	06/01/2009	[2]
JM04-C14(2.0)-060109		0906071-26	06/01/2009	[2]
JM04-C15(2.0)-060109		0906071-27	06/01/2009	[2]
JM04-C15FD(2.0)-060109	JM04-C15(2.0)-060109	0906071-28	06/01/2009	[2]
JM04-EB01-060109		0906071-29	06/01/2009	[2]
JM04-EB05-060409		0906071-30	06/04/2009	[1], [2]

ANALYSES PERFORMED CODES:
[1] – Select Polycyclic aromatic Hydrocarbons (PAH) by SW-846 8270C,
[2] – Arsenic by SW-846 6010B

General Data Qualifiers

As required by U.S. EPA protocols, all compounds, which were qualitatively identified at concentrations below their respective, reporting limits (RL) but above the method detection limit (MDL) have been qualified with "J" qualifiers on the data summary reports to indicate that they are quantitative estimates.

SOIL CLEANUP TARGET ACTION LEVEL REGULARTORY LIMITS

All samples collected and analyzed for the month of June 2009 for the select polycyclic aromatic hydrocarbons (PAH) and arsenic analyses were less than the action level soil cleanup target level regulatory limits with the exception of the analytes listed below:

Analyte (Metals List)	Affected Sample	Sample Results (mg/kg)	Soil Cleanup Target Levels (mg/kg)
Arsenic	JM04-A30(2.0)-060209	3.0J	2.65
Arsenic	JM04-B14(2.0)-060409	2.8	2.65
Arsenic	JM04-B23(2.0)-060409	4.3	2.65
Arsenic	JM04-B26(2.0)-060409	4.1	2.65
Arsenic	JM04-C3(2.0)-060109	2.8	2.65
Arsenic	JM04-C7A(2.0)-060109	3.2	2.65
Arsenic	JM04-C9(2.0)-060109	3	2.65
Arsenic	JM04-C12(2.0)-060109	2.9	2.65
Arsenic	JM04-B9(2.0)-060409	2.7	2.65

Organic Data Qualifiers

The samples were all collected on June 1st, 2009 thru June 4th, 2009 but not received by the laboratory until June 6th, 2009. CH2MHill notes that the procedure is to ship samples daily or at a minimum, the samples should be cooled and a temperature log must be kept. Due to professional judgment and the fact that the polycyclic aromatic hydrocarbon analytes are temperature sensitive, all of the field sample results were qualified as estimated with a low bias "J/UJ".

The quantitation limits reported for the benzo(a)pyrene in the samples listed below should be considered quantitative estimates. High percent difference recoveries during the continuing calibrations were reported during the polycyclic aromatic hydrocarbon analyses. Lack of precision during the continuing calibration indicates instrument instability; therefore a "J" qualifier was appended to the samples listed below to indicate that the reported values are quantitative estimates.

Compound	Affected Samples
Benzo(a)pyrene	JM04-A40(2.0)-060209, JM04-B1(2.0)-060409, JM04-B2(2.0)-060409, JM04-B3(2.0)-060409, JM04-B3FD(2.0)-060409, and JM04-B4(2.0)-060409

The quantitation limits reported for polycyclic aromatic hydrocarbons benzo(a)pyrene, benzo(b)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene for samples JM04-A22(2.0)-060309 and JM04-A28(2.0)-060209 should be considered quantitative estimates due to the biased low response reported for internal standard perylene-d12 during the sample analysis. Low internal standard recoveries are indicative of matrix interferences with the associated compounds; therefore a "J" qualifier was appended to the analytes listed above for samples JM04-A22(2.0)-060309 and JM04-A28(2.0)-060209 to indicate that the reported values are quantitative estimates.

The samples presented below were analyzed at dilutions for the analysis indicated. These dilutions may have resulted in surrogate compounds diluted below the instrument detection limit; therefore surrogate recoveries may not be reported for all diluted analysis. These dilutions were required to prevent saturation of the instrument, and/or to reduce the effects of the matrix on the target compounds.

Sample ID	Analysis	Dilution Factor
JM04-A14(2.0)-060309	PAH	5X
JM04-A15(2.0)-060209	PAH	5X
JM04-A22(2.0)-060309	PAH	5X
JM04-A22FD(2.0)-060309	PAH	5X
JM04-A23(2.0)-060309	PAH	5X
JM04-A28(2.0)-060209	PAH	5X
JM04-A29(2.0)-060209	PAH	5X
JM04-A35A(2.0)-060209	PAH	5X
JM04-A39(2.0)-060209	PAH	5X
JM04-A40(2.0)-060209	PAH	5X
JM04-A41(2.0)-060209	PAH	5X
JM04-B1(2.0)-060409	PAH	5X
JM04-B2(2.0)-060409	PAH	5X
JM04-B3(2.0)-060409	PAH	5X
JM04-B3FD(2.0)-060409	PAH	5X
JM04-B4(2.0)-060409	PAH	5X
JM04-B24(2.0)-060409	PAH	5X
JM04-B25(2.0)-060409	PAH	5X
JM04-B26(2.0)-060409	PAH	5X
JM04-B27(2.0)-060409	PAH	5X

Samples JM04-A22(2.0)-060309 and JM04-B3(2.0)-060409 and their blind field duplicate samples JM04-A22(2.0)-060309 and JM04-B3FD(2.0)-060409 were submitted to the laboratory to evaluate sampling and analytical precision for those compounds determined to be confidently detected. All compounds met AGVIQ-CH2M HILL's blind duplicate precision criteria of 30% for soil samples relative percent difference (RPD) for polycyclic aromatic hydrocarbons analysis.

Inorganic Qualifiers

Samples JM04-A8(2.0)-060309, JM04-A16(2.0)-060209, JM04-A22(2.0)-060309, JM04-A25(2.0)-060209, JM04-B3(2.0)-060409, JM04-B12(2.0)-060409, and JM04-C15(2.0)-060109 and their blind field duplicate samples JM04-A8FD(2.0)-060309, JM04-A16FD(2.0)-060209, JM04-A22FD(2.0)-060309, JM04-A25FD(2.0)-060209, JM04-B3FD(2.0)-060409, JM04-B12FD(2.0)-060409, and JM04-C15FD(2.0)-060109 were submitted to the laboratory to evaluate sampling and analytical precision for those compounds determined to be confidently detected. All compounds met AGVIQ-CH2M HILL's blind duplicate precision criteria of 30% for soil samples relative percent difference (RPD) for the metals analysis.

Summary

The organic and inorganic analyses were performed acceptably, but required qualifying statements. This analytical quality assurance report has identified the aspects of the data, which required qualification. These qualifiers are noted on the attached analytical sample summary reports. A support documentation package has been prepared for this quality assurance review and is filed with the NA Puerto Rico / SWMU 7 and 8 Soil Delineation project file.

Attachment A

VALID QUALIFIERS

QUALIFIER	
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit
J	The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
UJ	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R/UR	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet the quality control criteria. The presence or absence of the analyte cannot be verified.
B	The analyte was detected in the associated method and/or calibration blank.
JB	The analyte detected in the associated field, equipment, and/or trip blank.

QUALIFICATION CODE REFERENCE

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect.
C	Calibration %RSD or %D was noncompliant.	Correlation coefficient is <0.995.
K	Second source %D was noncompliant.	Second source %D was noncompliant.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
MB	Presumed contamination from preparation (method) blank.	Presumed contamination from preparation (method) blank or calibration blank.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
Q	MS/MSD recovery was poor or high RPD.	MS/MSD recovery was poor or high RPD.
G	Result is over the calibration range. No other acceptable result was provided.	Result is over the calibration range. Not other acceptable result was provided.
E	Not applicable.	Lab duplicate RPD showed poor agreement.
Z	Field duplicate RPD showed poor agreement.	Field duplicate RPD showed poor agreement
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D was not within control limits.
TN	Tuning (BFB or DFTPP) was noncompliant.	Not applicable.
T	Presumed contamination from trip blank.	Not applicable.
+	False positive—reported compound was not present.	Not applicable.
-	False negative—compound was present but not reported.	Not applicable.
F	Presumed contamination from FB or ER.	Presumed contamination from FB or ER.
$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Confirmation analysis RPD exceeded 40%.	Post Digestion Spike recovery was not within control limits.
T/D	Not applicable.	Total metals results were less than the dissolved metals result.
SD	Not applicable.	Seed correction factor was below the acceptable limit.
M	Results should be considered estimated due to matrix effects caused by saturation of non-target analytes.	Not applicable
OT	Results should be considered estimated due to sample was analyzed from jar.	Not applicable
LC	Laboratory contamination	Not applicable
ST	Sample Temperature non-conformance	Sample Temperature non-conformance

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-A14
(2.0)-060309

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06068

Matrix: (soil/water) SOIL Lab Sample ID: 0906068-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606811D

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/03/09 09:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/12/09 13:48

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	240	2200		UD LO-ST
205-99-2	Benzo(b)fluoranthene	210	2200		UD
50-32-8	Benzo(a)pyrene	150	2200		UD
193-39-5	Indeno(1,2,3-cd)pyrene	300	2200		UD

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-A15(
2.0)-060209

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06068

Matrix: (soil/water) SOIL Lab Sample ID: 0906068-12

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606812D

% Moisture: 25 decanted: (Y/N) N Date Sampled: 06/02/09 14:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/12/09 14:25

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	240	2200		UD
205-99-2	Benzo(b)fluoranthene	210	2200		UD
50-32-8	Benzo(a)pyrene	150	2200		UD
193-39-5	Indeno(1,2,3-cd)pyrene	310	2200		UD

LIST

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-A22(2.0)-060309

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06068

Matrix: (soil/water) SOIL Lab Sample ID: 0906068-19

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606819D

% Moisture: 16 decanted: (Y/N) N Date Sampled: 06/03/09 09:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/12/09 15:02

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	220	2000		UD
205-99-2	Benzo(b)fluoranthene	190	2000		UD
50-32-8	Benzo(a)pyrene	140	2000		UD
193-39-5	Indeno(1,2,3-cd)pyrene	270	2000		UD

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-A22F
D(2.0)-060309

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06068

Matrix: (soil/water) SOIL Lab Sample ID: 0906068-20

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606820D

% Moisture: 19 decanted: (Y/N) N Date Sampled: 06/03/09 09:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/12/09 15:40

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	220	2100	480	JD J-ST
205-99-2	Benzo(b)fluoranthene	200	2100	550	JD J-ST
50-32-8	Benzo(a)pyrene	140	2100		UD LJ-S
193-39-5	Indeno(1,2,3-cd)pyrene	290	2100		UD

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-A23(2.0)-060309

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06068

Matrix: (soil/water) SOIL Lab Sample ID: 0906068-21

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606821D

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/03/09 09:40

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/12/09 16:17

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	240	2200		UD
205-99-2	Benzo(b)fluoranthene	210	2200		UD
50-32-8	Benzo(a)pyrene	150	2200		UD
193-39-5	Indeno(1,2,3-cd)pyrene	300	2200		UD

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-EB0
4-060409

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06068

Matrix: (soil/water) WATER Lab Sample ID: 0906068-28

Sample wt/vol: 1060 (g/mL) ML Lab File ID: 0606828

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 06/04/09 09:55

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/17/09 07:46

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	0.86	4.7		U
205-99-2	Benzo(b)fluoranthene	0.67	4.7		U
50-32-8	Benzo(a)pyrene	0.57	4.7		U
193-39-5	Indeno(1,2,3-cd)pyrene	1.3	4.7		U

FORM I SV

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A1(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-01

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 79.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.4	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A2(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-02

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 79.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.6	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A6(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-03

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 80.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.3	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A7(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-04

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 79.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.1	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A8(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-05

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 77.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.2	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A8FD(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-06

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 79.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.1	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A9(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-07

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 76.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.4	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A10(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-08

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 79.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.5	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A11(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-09

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 79.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.7	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A12A(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-10

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 72.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.6	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A14(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-11

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 75.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.0	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A15(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-12

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 74.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.7	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A16(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-13

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 78.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.6	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A16FD(2.0)-0602
09

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-14

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 65.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.6	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A17(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-15

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 73.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.0	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A18(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-16

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 72.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.3	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A19(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-17

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 72.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.4	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A20(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-18

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 72.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.4	J		P

pd

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A22(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-19

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 84.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.7	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A22FD(2.0)-0603
09

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-20

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 80.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.7	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A23(2.0)-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-21

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 75.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.1	J		P

CL

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A24(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-22

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 73.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.2	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A25(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-23

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 81.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.4			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A25FD(2.0)-0602
09

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-24

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 80.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.6			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A26(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-25

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 74.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.1	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-A27(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): SOIL Lab Sample ID: 0906068-26

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 71.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.2	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-EB03-060309

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906068

Matrix (soil/water): WATER Lab Sample ID: 0906068-27

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	10.0	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-A28(2.0)-060209

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06069

Matrix: (soil/water) SOIL Lab Sample ID: 0906069-01

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606901D

% Moisture: 31 decanted: (Y/N) N Date Sampled: 06/02/09 11:20

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/12/09 17:31

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	260	2400		UD
205-99-2	Benzo(b)fluoranthene	230	2400		UD
50-32-8	Benzo(a)pyrene	170	2400		UD
193-39-5	Indeno(1,2,3-cd)pyrene	340	2400		UD

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-A29(2.0)-060209

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06069

Matrix: (soil/water) SOIL Lab Sample ID: 0906069-02

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606902D

% Moisture: 22 decanted: (Y/N) N Date Sampled: 06/02/09 15:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/12/09 18:09

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	230	2100		UD UJ-ST
205-99-2	Benzo(b)fluoranthene	200	2100		UD
50-32-8	Benzo(a)pyrene	150	2100		UD
193-39-5	Indeno(1,2,3-cd)pyrene	290	2100		UD

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-A35A
(2.0)-060209

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06069

Matrix: (soil/water) SOIL Lab Sample ID: 0906069-08

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606908D

% Moisture: 18 decanted: (Y/N) N Date Sampled: 06/02/09 12:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/12/09 18:46

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	220	2000		UD
205-99-2	Benzo(b)fluoranthene	190	2000		UD
50-32-8	Benzo(a)pyrene	140	2000		UD
193-39-5	Indeno(1,2,3-cd)pyrene	280	2000		UD

U5-ST

C.L

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-A39
(2.0)-060209

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06069

Matrix: (soil/water) SOIL Lab Sample ID: 0906069-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606911D

% Moisture: 45 decanted: (Y/N) N Date Sampled: 06/02/09 12:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/12/09 19:23

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	330	2400		UD LJ-ST
205-99-2	Benzo(b)fluoranthene	290	2400		UD
50-32-8	Benzo(a)pyrene	210	2400		UD
193-39-5	Indeno(1,2,3-cd)pyrene	420	2400		UD

C.D.

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-A40(2.0)-060209

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06069

Matrix: (soil/water) SOIL Lab Sample ID: 0906069-12

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606912D

% Moisture: 13 decanted: (Y/N) N Date Sampled: 06/02/09 15:50

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/12/09 22:28

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	210	1900		UD LT-ST
205-99-2	Benzo(b)fluoranthene	180	1900		UD ↓
50-32-8	Benzo(a)pyrene	130	1900		UD LT-ST
193-39-5	Indeno(1,2,3-cd)pyrene	260	1900		UD LT-ST

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-A41
(2.0)-060209

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06069

Matrix: (soil/water) SOIL Lab Sample ID: 0906069-13

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606913D

% Moisture: 9 decanted: (Y/N) N Date Sampled: 06/02/09 16:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/11/09 08:35

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	200	1800		UD
205-99-2	Benzo(b)fluoranthene	170	1800		UD
50-32-8	Benzo(a)pyrene	120	1800		UD
193-39-5	Indeno(1,2,3-cd)pyrene	250	1800		UD

LIST

ok

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-B1(2.0)-060409

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06069

Matrix: (soil/water) SOIL Lab Sample ID: 0906069-14

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606914D

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/04/09 11:10

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/12/09 23:04

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	240	2200		UD UJ-ST
205-99-2	Benzo(b)fluoranthene	210	2200		UD ↓
50-32-8	Benzo(a)pyrene	150	2200		UD UJ-ST
193-39-5	Indeno(1,2,3-cd)pyrene	300	2200		UD UJ-ST

ok

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-B2(2.0)-060409

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06069

Matrix: (soil/water) SOIL Lab Sample ID: 0906069-15

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606915D

% Moisture: 22 decanted: (Y/N) N Date Sampled: 06/04/09 10:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/12/09 23:41

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	230	2100		UD UJ-ST
205-99-2	Benzo(b)fluoranthene	200	2100		UD ↓
50-32-8	Benzo(a)pyrene	150	2100		UD UJ-CS
193-39-5	Indeno(1,2,3-cd)pyrene	300	2100		UD UJ-ST

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-B3(2.0)-060409

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06069

Matrix: (soil/water) SOIL Lab Sample ID: 0906069-16

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606916D

% Moisture: 26 decanted: (Y/N) N Date Sampled: 06/04/09 11:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/13/09 00:18

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	240	2200		UD
205-99-2	Benzo(b)fluoranthene	210	2200		UD
50-32-8	Benzo(a)pyrene	150	2200		UD
193-39-5	Indeno(1,2,3-cd)pyrene	310	2200		UD

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-B3FD
(2.0)-060409

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06069

Matrix: (soil/water) SOIL Lab Sample ID: 0906069-17

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606917D

% Moisture: 27 decanted: (Y/N) N Date Sampled: 06/04/09 11:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/13/09 00:55

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	250	2300		UD
205-99-2	Benzo(b)fluoranthene	220	2300		UD
50-32-8	Benzo(a)pyrene	160	2300		UD
193-39-5	Indeno(1,2,3-cd)pyrene	320	2300		UD

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-B4(2.0)-060409

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06069

Matrix: (soil/water) SOIL Lab Sample ID: 0906069-18

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0606918D

% Moisture: 16 decanted: (Y/N) N Date Sampled: 06/04/09 13:25

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/13/09 01:31

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	220	2000		UD UJ-ST
205-99-2	Benzo(b)fluoranthene	190	2000		UD ↓
50-32-8	Benzo(a)pyrene	140	2000		UD UJ-C
193-39-5	Indeno(1,2,3-cd)pyrene	270	2000		UD UJ-ST

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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-EB0
2-060209

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06069

Matrix: (soil/water) WATER Lab Sample ID: 0906069-27

Sample wt/vol: 900.0 (g/mL) ML Lab File ID: 0606927

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 06/02/09 16:30

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/17/09 08:23

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	1.0	5.6		U
205-99-2	Benzo(b)fluoranthene	0.79	5.6		U
50-32-8	Benzo(a)pyrene	0.67	5.6		U
193-39-5	Indeno(1,2,3-cd)pyrene	1.6	5.6		U

FORM I SV

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

JM04-A28(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-01

Level (low/med): LOW Date Received: 06/06/09

% Solids: 68.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.9	J		P

JM04-A29(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-02

Level (low/med): LOW Date Received: 06/06/09

% Solids: 78.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.7	J		P

JM04-A30(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-03

Level (low/med): LOW Date Received: 06/06/09

% Solids: 58.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.0	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

Form I - IN

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

JM04-A31(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-04

Level (low/med): LOW Date Received: 06/06/09

% Solids: 76.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.6	J		P

JM04-A32(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-05

Level (low/med): LOW Date Received: 06/06/09

% Solids: 75.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.7	J		P

JM04-A33(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-06

Level (low/med): LOW Date Received: 06/06/09

% Solids: 79.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.4	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

JM04-A34(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-07

Level (low/med): LOW Date Received: 06/06/09

% Solids: 70.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.4	J		P

JM04-A35A(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-08

Level (low/med): LOW Date Received: 06/06/09

% Solids: 81.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.9	J		P

JM04-A36(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-09

Level (low/med): LOW Date Received: 06/06/09

% Solids: 84.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.8	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

JM04-A37(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-10

Level (low/med): LOW Date Received: 06/06/09

% Solids: 74.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.5	J		P

JM04-A39(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-11

Level (low/med): LOW Date Received: 06/06/09

% Solids: 54.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.8	J		P

JM04-A40(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-12

Level (low/med): LOW Date Received: 06/06/09

% Solids: 87.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.7	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

JM04-A41(2.0)-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-13

Level (low/med): LOW Date Received: 06/06/09

% Solids: 91.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.95	J		P

JM04-B1(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-14

Level (low/med): LOW Date Received: 06/06/09

% Solids: 76.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.6	U		P

JM04-B2(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-15

Level (low/med): LOW Date Received: 06/06/09

% Solids: 77.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.7	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

JM04-B3(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-16

Level (low/med): LOW Date Received: 06/06/09

% Solids: 74.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.8	J		P

JM04-B3FD(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-17

Level (low/med): LOW Date Received: 06/06/09

% Solids: 72.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.5	J		P

JM04-B4(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): SOIL Lab Sample ID: 0906069-18

Level (low/med): LOW Date Received: 06/06/09

% Solids: 84.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.3	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

JM04-EB02-060209

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ SAS No.: _____ SDG No.: 0906069

Matrix (soil/water): WATER Lab Sample ID: 0906069-27

Level (low/med): LOW Date Received: 06/06/09

% Solids: _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	10.0	U		P

ok

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

Form I - IN

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-B24(2.0)-060409

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06071

Matrix: (soil/water) SOIL Lab Sample ID: 0906071-10

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0607110D

% Moisture: 24 decanted: (Y/N) N Date Sampled: 06/04/09 11:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/11/09 10:26

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	240	2200		UD
205-99-2	Benzo(b)fluoranthene	210	2200		UD
50-32-8	Benzo(a)pyrene	150	2200		UD
193-39-5	Indeno(1,2,3-cd)pyrene	300	2200		UD

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-B25(2.0)-060409

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06071

Matrix: (soil/water) SOIL Lab Sample ID: 0906071-11

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0607111D

% Moisture: 13 decanted: (Y/N) N Date Sampled: 06/04/09 10:30

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/11/09 11:03

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	210	1900		UD
205-99-2	Benzo(b)fluoranthene	180	1900		UD
50-32-8	Benzo(a)pyrene	130	1900		UD
193-39-5	Indeno(1,2,3-cd)pyrene	260	1900		UD

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FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-B26(2.0)-060409

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06071

Matrix: (soil/water) SOIL Lab Sample ID: 0906071-12

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0607112D

% Moisture: 27 decanted: (Y/N) N Date Sampled: 06/04/09 10:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/11/09 11:40

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	250	2300		UD UJ-S
205-99-2	Benzo(b)fluoranthene	220	2300		UD
50-32-8	Benzo(a)pyrene	160	2300		UD
193-39-5	Indeno(1,2,3-cd)pyrene	310	2300		UD

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-B27(2.0)-060409

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06071

Matrix: (soil/water) SOIL Lab Sample ID: 0906071-13

Sample wt/vol: 15.0 (g/mL) G Lab File ID: 0607113D

% Moisture: 15 decanted: (Y/N) N Date Sampled: 06/04/09 13:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/11/09 12:17

Injection Volume: 0.5(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	210	2000		UD UJ-ST
205-99-2	Benzo(b)fluoranthene	180	2000		UD
50-32-8	Benzo(a)pyrene	130	2000		UD
193-39-5	Indeno(1,2,3-cd)pyrene	270	2000		UD

FORM I SV

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

JM04-EB0
5-060409

Lab Name: EMPIRICAL LABS Contract: CH2MHILL

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: CH2.B06071

Matrix: (soil/water) WATER Lab Sample ID: 0906071-30

Sample wt/vol: 1060 (g/mL) ML Lab File ID: 0607130

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 06/04/09 15:40

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:06/09/09

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 06/17/09 09:37

Injection Volume: 0.5(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
56-55-3	Benzo(a)anthracene	0.86	4.7		U
205-99-2	Benzo(b)fluoranthene	0.67	4.7		U
50-32-8	Benzo(a)pyrene	0.57	4.7		U
193-39-5	Indeno(1,2,3-cd)pyrene	1.3	4.7		U

FORM I SV

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1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B12(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-01

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 78.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.1	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B12FD(2.0)-0604
09

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-02

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 84.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.5	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B13(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-03

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 83.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.3	U		P

CK

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B14(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-04

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 88.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.8			P

ok

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

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1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B15(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-05

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 77.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.3	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B18(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-06

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 76.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.5	J		P

ck

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B19(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-07

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 81.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.8	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B22(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-08

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 78.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.5	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

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1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B23(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-09

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 81.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	4.3			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments: _____

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B24(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-10

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 76.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.5	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B25(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-11

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 87.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.2	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B26(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-12

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 73.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	4.1			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-B27(2.0)-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-13

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 85.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.9	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C1(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-14

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 79.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.2	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C2(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-15

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 87.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	0.81	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C3(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-16

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 85.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.8			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C5(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-17

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 81.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.9	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C6(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-18

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 85.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.3			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C7A(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-19

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 90.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.2			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C8A(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-20

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 80.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.0	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C9(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-21

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 79.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.0			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C10(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-22

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 78.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.7	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C11(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-23

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 85.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.7	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C12(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-24

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 83.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.9			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C13A(2.0)-06010
9

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-25

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 67.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.6	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C14(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-26

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 92.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.8	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C15(2.0)-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-27

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 72.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	2.5	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-C15FD(2.0)-0601
09

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): SOIL Lab Sample ID: 0906071-28

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 82.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	1.8	J		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

Form IA-IN

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-EB01-060109

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): WATER Lab Sample ID: 0906071-29

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	10.0	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

JM04-EB05-060409

Lab Name: Empirical Laboratories Contract: CH2M Hill

Lab Code: _____ Case No.: _____ NRAS No.: _____ SDG NO.: 0906071

Matrix (soil/water): WATER Lab Sample ID: 0906071-30

Level (low/med): LOW Date Received: 6/6/2009

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	10.0	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

AGVIQ CH2M HILL

1000 Abernathy Road, Suite 1600
Atlanta, GA 30328
Tel No: (770) 604-9182
Fax No: (770) 604-9183

CHAIN-OF-CUSTODY RECORD

[1] COC NUMBER: 0000001

[2] PROJECT NAME:	[5] PROJECT NUMBER:	[8] LAB NAME AND CONTACT:	[11] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 1 (Name and Company)	[14] RECIPIENT 1 (Address, Tel No. , and Fax No.):
Naval Activity Puerto Rico	378718.10.02.01.07	Empirical Laboratories	Tom Beisel/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4033/770.604.9183
[3] PROJECT PHASE/SITE/TASK:	[6] CTO OR DO NUMBER:	[9] LAB PO NUMBER:	[12] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 2 (Name and Company)	[15] RECIPIENT 2 (Address, Tel No. , and Fax No.):
SWMU 7/8 - Soil Delineation Sampling	N62470-08-D-1006	30024338	Bryan Burkingstock/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4060/770.604.9183
[4] PROJECT CONTACT:	[7] PROJECT TEL NO AND FAX NO:	[10] LAB TEL NO AND FAX NO:	[13] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 3 (Name and Company)	[16] RECIPIENT 3 (Address, Tel No. , and Fax No.):
Samuel Smith	404.915.8292/770.604.9183	615.345.1115/615.345.5426		

[25] ANALYSES REQUIRED (Include Method Numbers)

[17] ITEM	[18] SAMPLE IDENTIFIER	[19] SAMPLE DESCRIPTION/LOCATION	[20] MATRIX (see codes on SOP)	[21] DATE COLLECTED	[22] TIME COLLECTED	[23] DATA PKG LEVEL (see codes on SOP)	[24] TAT (calendar days)	Arsenic - 6010B	Select PAH's - 8270C/8270D									[26] SAMPLE TYPE (see codes on SOP)	[27] COMMENTS/ SCREENING READINGS 0906068	[28] LAB ID (for lab's use)
1	JM04-A1(2.0)-060309	A1	SO	06/03/09	9:10	C/IV	14	X										N	7 Day Prelims	-01
2	JM04-A2(2.0)-060309	A2	SO	06/03/09	11:10	C/IV	14	X										N	7 Day Prelims	-02
3	JM04-A6(2.0)-060309	A6	SO	06/03/09	9:15	C/IV	14	X										N	7 Day Prelims	-03
4	JM04-A7(2.0)-060309	A7	SO	06/03/09	10:05	C/IV	14	X										N	7 Day Prelims	-04
5	JM04-A8(2.0)-060309	A8	SO	06/03/09	10:50	C/IV	14	X										N	7 Day Prelims	-05
6	JM04-A8FD(2.0)-060309	A8	SO	06/03/09	10:50	C/IV	14	X										FD	7 Day Prelims	-06
7	JM04-A9(2.0)-060409	A9	SO	06/04/09	8:40	C/IV	14	X										N	7 Day Prelims	-07
8	JM04-A10(2.0)-060409	A10	SO	06/04/09	9:25	C/IV	14	X										N	7 Day Prelims	-08
9	JM04-A10MS(2.0)-060409	A10	SO	06/04/09	9:25	C/IV	14	X										MSD	7 Day Prelims	↓
10	JM04-A10SD(2.0)-060409	A10	SO	06/04/09	9:25	C/IV	14	X										MSD	7 Day Prelims	↓

[29] SAMPLER(S) AND COMPANY: (please print)	[30] COURIER AND SHIPPING NUMBER:	[31] SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):
Samuel Smith/CH2M HILL Kimberley Coke/CH2M HILL	Fed-Ex/868591727517	

[32] RELINQUISHED BY	DATE	TIME	[33] RECEIVED BY	DATE	TIME
Printed Name and Signature:			Printed Name and Signature:		
Samuel Smith	June 5th, 2009	1510			
Printed Name and Signature:			Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:		
			Will Schwab	6/6/09	11:00

AGVIQ CH2M HILL

1000 Abernathy Road, Suite 1600
Atlanta, GA 30328
Tel No: (770) 604-9182
Fax No: (770) 604-9183

CHAIN-OF-CUSTODY RECORD

[1] COC NUMBER: 0000002

[2] PROJECT NAME:	[5] PROJECT NUMBER:	[8] LAB NAME AND CONTACT:	[11] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 1 (Name and Company)	[14] RECIPIENT 1 (Address, Tel No. , and Fax No.):
Naval Activity Puerto Rico	378718.10.02.01.07	Empirical Laboratories	Tom Beisel/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4033/770.604.9183
[3] PROJECT PHASE/SITE/TASK:	[6] CTO OR DO NUMBER:	[9] LAB PO NUMBER:	[12] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 2 (Name and Company)	[15] RECIPIENT 2 (Address, Tel No. , and Fax No.):
SWMU 7/8 - Soil Delineation Sampling	N62470-08-D-1006	30024338	Bryan Burkingstock/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4060/770.604.9183
[4] PROJECT CONTACT:	[7] PROJECT TEL NO AND FAX NO:	[10] LAB TEL NO AND FAX NO:	[13] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 3 (Name and Company)	[16] RECIPIENT 3 (Address, Tel No. , and Fax No.):
Samuel Smith	404.915.8292/770.604.9183	615.345.1115/615.345.5426		

[25] ANALYSES REQUIRED (Include Method Numbers)

[17] ITEM	[18] SAMPLE IDENTIFIER	[19] SAMPLE DESCRIPTION/LOCATION	[20] MATRIX (see codes on SOP)	[21] DATE COLLECTED	[22] TIME COLLECTED	[23] DATA PKG LEVEL (see codes on SOP)	[24] TAT (calendar days)	Arsenic - 6010B	Select PAH's - 8270C/8270D									[26] SAMPLE TYPE (see codes on SOP)	[27] COMMENTS/ SCREENING READINGS 0906068	[28] LAB ID (for lab's use)
1	JM04-A11(2.0)-060309	A11	SO	06/03/09	13:45	C/IV	14	X										N	7 Day Prelims	-09
2	JM04-A12A(2.0)-060309	A12A	SO	06/03/09	14:00	C/IV	14	X										N	7 Day Prelims	-10
3	JM04-A14(2.0)-060309	A14	SO	06/03/09	9:40	C/IV	14	X	X									N	7 Day Prelims	-11
4	JM04-A14MS(2.0)-060309	A14	SO	06/03/09	9:40	C/IV	14	X	X									MSD	7 Day Prelims	↓
5	JM04-A114SD(2.0)-060309	A14	SO	06/03/09	9:40	C/IV	14	X	X									MSD	7 Day Prelims	↓
6	JM04-A15(2.0)-060209	A15	SO	06/02/09	14:40	C/IV	14	X	X									N	7 Day Prelims	-12
7	JM04-A16(2.0)-060209	A16	SO	06/02/09	14:30	C/IV	14	X										N	7 Day Prelims	-13
8	JM04-A16FD(2.0)-060209	A16	SO	06/02/09	14:30	C/IV	14	X										FD	7 Day Prelims	-14
9	JM04-A17(2.0)-060409	A17	SO	06/04/09	8:45	C/IV	14	X										N	7 Day Prelims	-15
10	JM04-A18(2.0)-060409	A18	SO	06/04/09	8:35	C/IV	14	X										N	7 Day Prelims	-16

[29] SAMPLER(S) AND COMPANY: (please print)	[30] COURIER AND SHIPPING NUMBER:	[31] SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):
Samuel Smith/CH2M HILL Kimberley Coke/CH2M HILL	Fed-Ex/868591727517	

[32] RELINQUISHED BY	DATE	TIME	[33] RECEIVED BY	DATE	TIME
Printed Name and Signature:			Printed Name and Signature:		
Samuel Smith	June 5th, 2009	1510			
Printed Name and Signature:			Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:		
			Will Schwab	6/6/09	11:00

AGVIQ CH2M HILL

1000 Abernathy Road, Suite 1600
Atlanta, GA 30328
Tel No: (770) 604-9182
Fax No: (770) 604-9183

CHAIN-OF-CUSTODY RECORD

[1] COC NUMBER: 0000003

[2] PROJECT NAME:	[5] PROJECT NUMBER:	[8] LAB NAME AND CONTACT:	[11] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 1 (Name and Company)	[14] RECIPIENT 1 (Address, Tel No. , and Fax No.):
Naval Activity Puerto Rico	378718.10.02.01.07	Empirical Laboratories	Tom Beisel/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4033/770.604.9183
[3] PROJECT PHASE/SITE/TASK:	[6] CTO OR DO NUMBER:	[9] LAB PO NUMBER:	[12] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 2 (Name and Company)	[15] RECIPIENT 2 (Address, Tel No. , and Fax No.):
SWMU 7/8 - Soil Delineation Sampling	N62470-08-D-1006	30024338	Bryan Burkingstock/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4060/770.604.9183
[4] PROJECT CONTACT:	[7] PROJECT TEL NO AND FAX NO:	[10] LAB TEL NO AND FAX NO:	[13] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 3 (Name and Company)	[16] RECIPIENT 3 (Address, Tel No. , and Fax No.):
Samuel Smith	404.915.8292/770.604.9183	615.345.1115/615.345.5426		

[25] ANALYSES REQUIRED (Include Method Numbers)

[17] ITEM	[18] SAMPLE IDENTIFIER	[19] SAMPLE DESCRIPTION/LOCATION	[20] MATRIX (see codes on SOP)	[21] DATE COLLECTED	[22] TIME COLLECTED	[23] DATA PKG LEVEL (see codes on SOP)	[24] TAT (calendar days)	Arsenic - 6010B	Select PAH's - 8270C/8270D									[26] SAMPLE TYPE (see codes on SOP)	[27] COMMENTS/ SCREENING READINGS 0906068	[28] LAB ID (for lab's use)
1	JM04-A19(2.0)-060309	A19	SO	06/03/09	13:45	C/IV	14	X										N	7 Day Prelims	-17
2	JM04-A20(2.0)-060309	A20	SO	06/03/09	14:00	C/IV	14	X										N	7 Day Prelims	-18
3	JM04-A22(2.0)-060309	A22	SO	06/03/09	9:40	C/IV	14	X	X									N	7 Day Prelims	-19
4	JM04-A22FD(2.0)-060309	A22	SO	06/03/09	9:40	C/IV	14	X	X									FD	7 Day Prelims	-20
5	JM04-A23(2.0)-060309	A23	SO	06/03/09	9:40	C/IV	14	X	X									N	7 Day Prelims	-21
6	JM04-A24(2.0)-060209	A24	SO	06/02/09	14:40	C/IV	14	X	X									N	7 Day Prelims	-22
7	JM04-A25(2.0)-060209	A25	SO	06/02/09	14:30	C/IV	14	X										N	7 Day Prelims	-23
8	JM04-A25(2.0)-060209	A25	SO	06/02/09	14:30	C/IV	14	X										FD	7 Day Prelims	-24
9	JM04-A26(2.0)-060409	A26	SO	06/04/09	8:45	C/IV	14	X										N	7 Day Prelims	-25
10	JM04-A27(2.0)-060409	A27	SO	06/04/09	8:35	C/IV	14	X										N	7 Day Prelims	-26

[29] SAMPLER(S) AND COMPANY: (please print)	[30] COURIER AND SHIPPING NUMBER:	[31] SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):
Samuel Smith/CH2M HILL Kimberley Coke/CH2M HILL	Fed-Ex/868591727517	

[32] RELINQUISHED BY	DATE	TIME	[33] RECEIVED BY	DATE	TIME
Printed Name and Signature: Samuel Smith	June 5th, 2009	1510	Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature: Will Schwab	6/6/09	11:00

AGVIQ CH2M HILL

1000 Abernathy Road, Suite 1600
Atlanta, GA 30328
Tel No: (770) 604-9182
Fax No: (770) 604-9183

CHAIN-OF-CUSTODY RECORD

[1] COC NUMBER: 0000010

[2] PROJECT NAME:	[5] PROJECT NUMBER:	[8] LAB NAME AND CONTACT:	[11] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 1 (Name and Company)	[14] RECIPIENT 1 (Address, Tel No. , and Fax No.):
Naval Activity Puerto Rico	378718.10.02.01.07	Empirical Laboratories	Tom Beisel/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4033/770.604.9183
[3] PROJECT PHASE/SITE/TASK:	[6] CTO OR DO NUMBER:	[9] LAB PO NUMBER:	[12] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 2 (Name and Company)	[15] RECIPIENT 2 (Address, Tel No. , and Fax No.):
SWMU 7/8 - Soil Delineation Sampling	N62470-08-D-1006	30024338	Bryan Burkingstock/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4060/770.604.9183
[4] PROJECT CONTACT:	[7] PROJECT TEL NO AND FAX NO:	[10] LAB TEL NO AND FAX NO:	[13] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 3 (Name and Company)	[16] RECIPIENT 3 (Address, Tel No. , and Fax No.):
Samuel Smith	404.915.8292/770.604.9183	615.345.1115/615.345.5426		

[25] ANALYSES REQUIRED (Include Method Numbers)

[17] ITEM	[18] SAMPLE IDENTIFIER	[19] SAMPLE DESCRIPTION/LOCATION	[20] MATRIX (see codes on SOP)	[21] DATE COLLECTED	[22] TIME COLLECTED	[23] DATA PKG LEVEL (see codes on SOP)	[24] TAT (calendar days)	Arsenic - 6010B	Select PAH's - 8270C/8270D									[26] SAMPLE TYPE (see codes on SOP)	[27] COMMENTS/ SCREENING READINGS 0906068	[28] LAB ID (for lab's use)
1	JM04-EB03-060309	EB03	WQ	06/03/09	16:00	C/IV	14	X										N	Acetate Sleeve/7 Day Prelims	-27
2	JM04-EB04-060409	EB04	WQ	06/04/09	9:55	C/IV	14		X									N	Acetate Sleeve/7 Day Prelims	-28
3	JM04-EB05-060409	EB05	WQ	06/04/09	15:40	C/IV	14	X	X									N	Hand Auger/7 Day Prelims	
4	JM04-EB06-060409	EB06	WQ	06/04/09	15:40	C/IV	14		X									N	Shoe/7 Day Prelims	
5																			126 TOTAL BOTTLES	
6																				
7																				
8																				
9																				
10																				

[29] SAMPLER(S) AND COMPANY: (please print)	[30] COURIER AND SHIPPING NUMBER:	[31] SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):
Samuel Smith/CH2M HILL Kimberley Coke/CH2M HILL	Fed-Ex/868591727517	

[32] RELINQUISHED BY	DATE	TIME	[33] RECEIVED BY	DATE	TIME
Printed Name and Signature:			Printed Name and Signature:		
Samuel Smith	June 5th, 2009	1510			
Printed Name and Signature:			Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:		
			Will Schwab	6/6/09	11:00

AGVIQ CH2M HILL

1000 Abernathy Road, Suite 1600
Atlanta, GA 30328
Tel No: (770) 604-9182
Fax No: (770) 604-9183

CHAIN-OF-CUSTODY RECORD

COC NUMBER: 0000004

PROJECT NAME:	PROJECT NUMBER:	LAB NAME AND CONTACT:	FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 1 (Name and Company)	RECIPIENT 1 (Address, Tel No., and Fax No.):
Naval Activity Puerto Rico	378718.10.02.01.07	Empirical Laboratories	Tom Beisel/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4033/770.604.9183
PROJECT PHASE/SITE/TASK:	CTO OR DO NUMBER:	LAB PO NUMBER:	FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 2 (Name and Company)	RECIPIENT 2 (Address, Tel No., and Fax No.):
SWMU 7/8 - Soil Delineation Sampling	N62470-08-D-1006	30024338	Bryan Burkingstock/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4060/770.604.9183
PROJECT CONTACT:	PROJECT TEL NO AND FAX NO:	LAB TEL NO AND FAX NO:	FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 3 (Name and Company)	RECIPIENT 3 (Address, Tel No., and Fax No.):
Samuel Smith	404.915.8292/770.604.9183	615.345.1115/615.345.5426		

ANALYSES REQUIRED (Include Method Numbers)

ITEM	SAMPLE IDENTIFIER	SAMPLE DESCRIPTION/LOCATION	MATRIX (see codes on SOP)	DATE COLLECTED	TIME COLLECTED	DATA PKG LEVEL (see codes on SOP)	TAT (calendar days)	Arsenic - 6010B	Select PAH's - 8270C/8270D	SAMPLE TYPE (see codes on SOP)	COMMENTS/ SCREENING READINGS 090669	LAB ID (for lab's use)
1	JM04-A28(2.0)-060209	A28	SO	06/02/09	11:20	C/IV	14	X	X	N	7 Day Prelims	-01
2	JM04-A29(2.0)-060209	A29	SO	06/02/09	15:15	C/IV	14	X	X	N	7 Day Prelims	-02
3	JM04-A30(2.0)-060209	A30	SO	06/02/09	15:35	C/IV	14	X		N	7 Day Prelims	-03
4	JM04-A31(2.0)-060209	A31	SO	06/02/09	14:05	C/IV	14	X		N	7 Day Prelims	-04
5	JM04-A32(2.0)-060209	A32	SO	06/02/09	14:00	C/IV	14	X		N	7 Day Prelims	-05
6	JM04-A33(2.0)-060209	A33	SO	06/02/09	11:25	C/IV	14	X		N	7 Day Prelims	-06
7	JM04-A34(2.0)-060209	A34	SO	06/02/09	11:55	C/IV	14	X		N	7 Day Prelims	-07
8	JM04-A35A(2.0)-060209	A35A	SO	06/02/09	12:05	C/IV	14	X	X	N	7 Day Prelims	-08
9	JM04-A36(2.0)-060209	A36	SO	06/02/09	13:50	C/IV	14	X		N	7 Day Prelims	-09
10	JM04-A37(2.0)-060209	A37	SO	06/02/09	11:35	C/IV	14	X		N	7 Day Prelims	-10

SAMPLER(S) AND COMPANY: (please print)	COURIER AND SHIPPING NUMBER:	SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):
Samuel Smith/CH2M HILL Kimberley Coke/CH2M HILL	Fed-Ex/868591727517	

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Printed Name and Signature: Samuel Smith [signature]	June 5th, 2009	1510	Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature: Will Schwab [signature]	6/6/09	11:00

AGVIQ CH2M HILL

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Tel No: (770) 604-9182
Fax No: (770) 604-9183

CHAIN-OF-CUSTODY RECORD

[1] COC NUMBER: **0000005**

[2] PROJECT NAME:	[5] PROJECT NUMBER:	[8] LAB NAME AND CONTACT:	[11] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 1 (Name and Company)	[14] RECIPIENT 1 (Address, Tel No. , and Fax No.):
Naval Activity Puerto Rico	378718.10.02.01.07	Empirical Laboratories	Tom Beisel/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4033/770.604.9183
[3] PROJECT PHASE/SITE/TASK:	[6] CTO OR DO NUMBER:	[9] LAB PO NUMBER:	[12] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 2 (Name and Company)	[15] RECIPIENT 2 (Address, Tel No. , and Fax No.):
SWMU 7/8 - Soil Delineation Sampling	N62470-08-D-1006	30024338	Bryan Burkingstock/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4060/770.604.9183
[4] PROJECT CONTACT:	[7] PROJECT TEL NO AND FAX NO:	[10] LAB TEL NO AND FAX NO:	[13] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 3 (Name and Company)	[16] RECIPIENT 3 (Address, Tel No. , and Fax No.):
Samuel Smith	404.915.8292/770.604.9183	615.345.1115/615.345.5426		

[25] ANALYSES REQUIRED (Include Method Numbers)

[17] ITEM	[18] SAMPLE IDENTIFIER	[19] SAMPLE DESCRIPTION/LOCATION	[20] MATRIX (see codes on SOP)	[21] DATE COLLECTED	[22] TIME COLLECTED	[23] DATA PKG LEVEL (see codes on SOP)	[24] TAT (calendar days)	Arsenic - 6010B	Select PAH's - 8270C/8270D									[26] SAMPLE TYPE (see codes on SOP)	[27] COMMENTS/ SCREENING READINGS 0906069	[28] LAB ID (for lab's use)
1	JM04-A39(2.0)-060209	A39	SO	06/02/09	12:15	C/IV	14	X	X									N	7 Day Prelims	-11
2	JM04-A40(2.0)-060209	A40	SO	06/02/09	15:50	C/IV	14	X	X									N	7 Day Prelims	-12
3	JM04-A41(2.0)-060209	A41	SO	06/02/09	16:00	C/IV	14	X	X									N	7 Day Prelims	-13
4	JM04-A41MS(2.0)-060209	A41	SO	06/02/09	16:00	C/IV	14	X	X									MSD	7 Day Prelims	↓
5	JM04-A41SD(2.0)-060209	A41	SO	06/02/09	16:00	C/IV	14	X	X									MSD	7 Day Prelims	↓
6	JM04-B1(2.0)-060409	B1	SO	06/04/09	11:10	C/IV	14	X	X									N	7 Day Prelims	-14
7	JM04-B2(2.0)-060409	B2	SO	06/04/09	10:05	C/IV	14	X	X									N	7 Day Prelims	-15
8	JM04-B3(2.0)-060409	B3	SO	06/04/09	11:25	C/IV	14	X	X									N	7 Day Prelims	-16
9	JM04-B3FD(2.0)-060409	B3	SO	06/04/09	11:25	C/IV	14	X	X									FD	7 Day Prelims	-17
10	JM04-B4(2.0)-060409	B4	SO	06/04/09	13:25	C/IV	14	X	X									N	7 Day Prelims	-18

[29] SAMPLER(S) AND COMPANY: (please print)	[30] COURIER AND SHIPPING NUMBER:	[31] SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):
Samuel Smith/CH2M HILL Kimberley Coke/CH2M HILL	Fed-Ex/868591727517	

[32] RELINQUISHED BY	DATE	TIME	[33] RECEIVED BY	DATE	TIME
Printed Name and Signature:			Printed Name and Signature:		
Samuel Smith	June 5th, 2009	1510			
Printed Name and Signature:			Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:		
				6/6/09	11:00

AGVIQ CH2M HILL

1000 Abernathy Road, Suite 1600
Atlanta, GA 30328
Tel No: (770) 604-9182
Fax No: (770) 604-9183

CHAIN-OF-CUSTODY RECORD

[1] COC NUMBER: **0000009**

[2] PROJECT NAME:	[5] PROJECT NUMBER:	[8] LAB NAME AND CONTACT:	[11] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 1 (Name and Company)	[14] RECIPIENT 1 (Address, Tel No. , and Fax No.):
Naval Activity Puerto Rico	378718.10.02.01.07	Empirical Laboratories	Tom Beisel/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4033/770.604.9183
[3] PROJECT PHASE/SITE/TASK:	[6] CTO OR DO NUMBER:	[9] LAB PO NUMBER:	[12] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 2 (Name and Company)	[15] RECIPIENT 2 (Address, Tel No. , and Fax No.):
SWMU 7/8 - Soil Delineation Sampling	N62470-08-D-1006	30024338	Bryan Burkingstock/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4060/770.604.9183
[4] PROJECT CONTACT:	[7] PROJECT TEL NO AND FAX NO:	[10] LAB TEL NO AND FAX NO:	[13] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 3 (Name and Company)	[16] RECIPIENT 3 (Address, Tel No. , and Fax No.):
Samuel Smith	404.915.8292/770.604.9183	615.345.1115/615.345.5426		

[25] ANALYSES REQUIRED (Include Method Numbers)

[17] ITEM	[18] SAMPLE IDENTIFIER	[19] SAMPLE DESCRIPTION/LOCATION	[20] MATRIX (see codes on SOP)	[21] DATE COLLECTED	[22] TIME COLLECTED	[23] DATA PKG LEVEL (see codes on SOP)	[24] TAT (calendar days)	Arsenic - 6010B	Select PAH's - 8270C/8270D									[26] SAMPLE TYPE (see codes on SOP)	[27] COMMENTS/ SCREENING READINGS 0906069	[28] LAB ID (for lab's use)
1	JM04-C9(2.0)-060109	C9	SO	06/01/09	13:20	C/IV	14	X	X									N	7 Day Prelims	
2	JM04-C10(2.0)-060109	C10	SO	06/01/09	11:50	C/IV	14	X	X									N	7 Day Prelims	
3	JM04-C11(2.0)-060109	C11	SO	06/01/09	11:40	C/IV	14	X	X									N	7 Day Prelims	
4	JM04-C12(2.0)-060109	C12	SO	06/01/09	13:55	C/IV	14	X	X									N	7 Day Prelims	
5	JM04-C13A(2.0)-060109	C13A	SO	06/01/09	13:30	C/IV	14	X	X									N	7 Day Prelims	
6	JM04-C14(2.0)-060109	C14	SO	06/01/09	13:35	C/IV	14	X	X									N	7 Day Prelims	
7	JM04-C15(2.0)-060109	C15	SO	06/01/09	14:10	C/IV	14	X	X									N	7 Day Prelims	
8	JM04-C15FD(2.0)-060109	C15	SO	06/01/09	14:10	C/IV	14	X	X									FD	7 Day Prelims	
9	JM04-EB01-060109	EB01	WQ	06/01/09	16:30	C/IV	14	X										N	7 Day Prelims	
10	JM04-EB02-060209	EB02	WQ	06/02/09	16:30	C/IV	14	X	X									N	Hand Auger/7 Day Prelims	-27

[29] SAMPLER(S) AND COMPANY: (please print)	[30] COURIER AND SHIPPING NUMBER:	[31] SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):
Samuel Smith/CH2M HILL Kimberley Coke/CH2M HILL	Fed-Ex/868591727517	

[32] RELINQUISHED BY	DATE	TIME	[33] RECEIVED BY	DATE	TIME
Printed Name and Signature: Samuel Smith	June 5th, 2009	1510	Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:	6/6/09	11:00

Distribution: [ ] Original [illegible]

CH2M HILL

Atlanta, GA 30328
Tel No: (770) 604-9182
Fax No: (770) 604-9183

CHAIN-OF-CUSTODY RECORD

[1] COC NUMBER: 0000007

[2] PROJECT NAME: Naval Activity Puerto Rico	[5] PROJECT NUMBER: 378718.10.02.01.07	[8] LAB NAME AND CONTACT: Empirical Laboratories	[11] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 1 (Name and Company): Tom Beisel/CH2M HILL	[14] RECIPIENT 1 (Address, Tel No. , and Fax No.): 1000 Abernathy Road, Atlanta GA 30328. 678.530.4033/770.604.9183
[3] PROJECT PHASE/SITE/TASK: SWMU 7/8 - Soil Delineation Sampling	[6] CTO OR DO NUMBER: N62470-08-D-1006	[9] LAB PO NUMBER: 30024338	[12] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 2 (Name and Company): Bryan Burkingstock/CH2M HILL	[15] RECIPIENT 2 (Address, Tel No. , and Fax No.): 1000 Abernathy Road, Atlanta GA 30328. 678.530.4060/770.604.9183
[4] PROJECT CONTACT: Samuel Smith	[7] PROJECT TEL NO AND FAX NO: 404.915.8292/770.604.9183	[10] LAB TEL NO AND FAX NO: 615.345.1115/615.345.5426	[13] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 3 (Name and Company):	[16] RECIPIENT 3 (Address, Tel No. , and Fax No.):

[25] ANALYSES REQUIRED (Include Method Numbers)

[17] ITEM	[18] SAMPLE IDENTIFIER	[19] SAMPLE DESCRIPTION/LOCATION	[20] MATRIX (see codes on SOP)	[21] DATE COLLECTED	[22] TIME COLLECTED	[23] DATA PKG LEVEL (see codes on SOP)	[24] TAT (calendar days)	Arsenic - 6010B	Select PAH's - 8270C/8270D									[26] SAMPLE TYPE (see codes on SOP)	[27] COMMENTS/ SCREENING READINGS 0906671	[28] LAB ID (for lab's use) -
1	JM04-B12(2.0)-060409	B12	SO	06/04/09	14:40	C/IV	14	X	X									N	7 Day Prelims	-01
2	JM04-B12FD(2.0)-060409	B12	SO	06/04/09	14:40	C/IV	14	X	X									FD	7 Day Prelims	-02
3	JM04-B13(2.0)-060409	B13	SO	06/04/09	13:45	C/IV	14	X										N	7 Day Prelims	-03
4	JM04-B14(2.0)-060409	B14	SO	06/04/09	14:00	C/IV	14	X										N	7 Day Prelims	-04
5	JM04-B15(2.0)-060409	B15	SO	06/04/09	14:45	C/IV	14	X										N	7 Day Prelims	-05
6	JM04-B18(2.0)-060409	B18	SO	06/04/09	15:10	C/IV	14	X										N	7 Day Prelims	-06
7	JM04-B19(2.0)-060409	B19	SO	06/04/09	14:55	C/IV	14	X										N	7 Day Prelims	-07
8	JM04-B22(2.0)-060409	B22	SO	06/04/09	15:15	C/IV	14	X										N	7 Day Prelims	-08
9	JM04-B23(2.0)-060409	B23	SO	06/04/09	15:25	C/IV	14	X										N	7 Day Prelims	-09
10	JM04-B24(2.0)-060409	B24	SO	06/04/09	11:00	C/IV	14	X	X									N	7 Day Prelims	-10

[29] SAMPLER(S) AND COMPANY: (please print)
Samuel Smith/CH2M HILL
Kimberley Coke/CH2M HILL

[30] COURIER AND SHIPPING NUMBER:
Fed-Ex/868591727517

[31] SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):

[32] RELINQUISHED BY	DATE	TIME	[33] RECEIVED BY	DATE	TIME
Printed Name and Signature: Samuel Smith	June 5th, 2009	1570	Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:	6/6/09	11:00

Distribution: [ ] **Original** - Laboratory (To be returned with Analytical Report); [ ] **Copy 1** - Project File; [ ] **Copy 2** - PMO

Form CC1001, Rev 06/00

CH2M HILL

Tel No: (770) 604-9182
Fax No: (770) 604-9183

CHAIN-OF-CUSTODY RECORD

COC NUMBER: 0000008

2 PROJECT NAME: Naval Activity Puerto Rico	5 PROJECT NUMBER: 378718.10.02.01.07	8 LAB NAME AND CONTACT: Empirical Laboratories	11 FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 1 (Name and Company) Tom Beisel/CH2M HILL	14 RECIPIENT 1 (Address, Tel No. , and Fax No.): 1000 Abernathy Road, Atlanta GA 30328. 678.530.4033/770.604.9183
3 PROJECT PHASE/SITE/TASK: SWMU 7/8 - Soil Delineation Sampling	6 CTO OR DO NUMBER: N62470-08-D-1006	9 LAB PO NUMBER: 30024338	12 FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 2 (Name and Company) Bryan Burkingstock/CH2M HILL	15 RECIPIENT 2 (Address, Tel No. , and Fax No.): 1000 Abernathy Road, Atlanta GA 30328. 678.530.4060/770.604.9183
4 PROJECT CONTACT: Samuel Smith	7 PROJECT TEL NO AND FAX NO: 404.915.8292/770.604.9183	10 LAB TEL NO AND FAX NO: 615.345.1115/615.345.5426	13 FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 3 (Name and Company)	16 RECIPIENT 3 (Address, Tel No. , and Fax No.):

25 ANALYSES REQUIRED (Include Method Numbers)

17 ITEM	18 SAMPLE IDENTIFIER	19 SAMPLE DESCRIPTION/LOCATION	20 MATRIX (see codes on SOP)	21 DATE COLLECTED	22 TIME COLLECTED	23 DATA PKG LEVEL (see codes on SOP)	24 TAT (calendar days)	Arsenic - 6010B	Select PAH's - 8270C/8270D									26 SAMPLE TYPE (see codes on SOP)	27 COMMENTS/ SCREENING READINGS 0906071	28 LAB ID (for lab's use)
1	JM04-B25(2.0)-060409	B25	SO	06/04/09	10:30	C/IV	14	X	X									N	7 Day Prelims	-11
2	JM04-B26(2.0)-060409	B26	SO	06/04/09	10:15	C/IV	14	X	X									N	7 Day Prelims	-12
3	JM04-B27(2.0)-060409	B27	SO	06/04/09	13:05	C/IV	14	X	X									N	7 Day Prelims	-13
4	JM04-C1(2.0)-060109	C1	SO	06/01/09	10:20	C/IV	14	X										N	7 Day Prelims	-14
5	JM04-C2(2.0)-060109	C2	SO	06/01/09	10:30	C/IV	14	X										N	7 Day Prelims	-15
6	JM04-C3(2.0)-060109	C3	SO	06/01/09	11:10	C/IV	14	X										N	7 Day Prelims	-16
7	JM04-C5(2.0)-060109	C5	SO	06/01/09	10:40	C/IV	14	X										N	7 Day Prelims	-17
8	JM04-C6(2.0)-060109	C6	SO	06/01/09	11:35	C/IV	14	X										N	7 Day Prelims	-18
9	JM04-C7A(2.0)-060109	C7A	SO	06/01/09	11:05	C/IV	14	X										N	7 Day Prelims	-19
10	JM04-C8A(2.0)-060109	C8A	SO	06/01/09	11:20	C/IV	14	X										N	7 Day Prelims	-20

29 SAMPLER(S) AND COMPANY: (please print)
Samuel Smith/CH2M HILL
Kimberley Coke/CH2M HILL

30 COURIER AND SHIPPING NUMBER:
Fed-Ex/868591727517

31 SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):

32 RELINQUISHED BY	DATE	TIME	33 RECEIVED BY	DATE	TIME
Printed Name and Signature: Samuel Smith	June 5th, 2009	1510	Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:	6/6/09	11:00

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Form CCI001, Rev 06/00

CH2M HILL

Tel No: (770) 604-9182
Fax No: (770) 604-9183

CHAIN-OF-CUSTODY RECORD

0000009

[7] PROJECT NAME:	[8] PROJECT NUMBER:	[9] LAB NAME AND CONTACT:	[11] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 1 (Name and Company)	[14] RECIPIENT 1 (Address, Tel No., and Fax No.):
Naval Activity Puerto Rico	378718.10.02.01.07	Empirical Laboratories	Tom Beisel/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4033/770.604.9183
[5] PROJECT PHASE/SITE/TASK:	[6] CTO OR DO NUMBER:	[9] LAB PO NUMBER:	[12] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 2 (Name and Company)	[15] RECIPIENT 2 (Address, Tel No., and Fax No.):
SWMU 7/8 - Soil Delineation Sampling	N62470-08-D-1006	30024338	Bryan Burkingstock/CH2M HILL	1000 Abernathy Road, Atlanta GA 30328. 678.530.4060/770.604.9183
[4] PROJECT CONTACT:	[7] PROJECT TEL NO AND FAX NO:	[10] LAB TEL NO AND FAX NO:	[13] FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 3 (Name and Company)	[16] RECIPIENT 3 (Address, Tel No., and Fax No.):
Samuel Smith	404.915.8292/770.604.9183	615.345.1115/615.345.5426		

[25] ANALYSES REQUIRED (Include Method Numbers)

[17] ITEM	[18] SAMPLE IDENTIFIER	[19] SAMPLE DESCRIPTION/LOCATION	[20] MATRIX (see codes on SOP)	[21] DATE COLLECTED	[22] TIME COLLECTED	[23] DATA PKG LEVEL (see codes on SOP)	[24] TAT (calendar days)	Arsenic - 6010B	Select PAH's - 8270C/8270D									[26] SAMPLE TYPE (see codes on SOP)	[27] COMMENTS/ SCREENING READINGS 0906671	[28] LAB ID (for lab's use)
1	JM04-C9(2.0)-060109	C9	SO	06/01/09	13:20	C/IV	14	X	X									N	7 Day Prelims	-21
2	JM04-C10(2.0)-060109	C10	SO	06/01/09	11:50	C/IV	14	X	X									N	7 Day Prelims	-22
3	JM04-C11(2.0)-060109	C11	SO	06/01/09	11:40	C/IV	14	X	X									N	7 Day Prelims	-23
4	JM04-C12(2.0)-060109	C12	SO	06/01/09	13:55	C/IV	14	X	X									N	7 Day Prelims	-24
5	JM04-C13A(2.0)-060109	C13A	SO	06/01/09	13:30	C/IV	14	X	X									N	7 Day Prelims	-25
6	JM04-C14(2.0)-060109	C14	SO	06/01/09	13:35	C/IV	14	X	X									N	7 Day Prelims	-26
7	JM04-C15(2.0)-060109	C15	SO	06/01/09	14:10	C/IV	14	X	X									N	7 Day Prelims	-27
8	JM04-C15FD(2.0)-060109	C15	SO	06/01/09	14:10	C/IV	14	X	X									FD	7 Day Prelims	-28
9	JM04-EB01-060109	EB01	WQ	06/01/09	16:30	C/IV	14	X										N	7 Day Prelims	-29
10	JM04-EB02-060209	EB02	WQ	06/02/09	16:30	C/IV	14	X	X									N	Hand Auger/7 Day Prelims	

[29] SAMPLER(S) AND COMPANY: (please print)	[30] COURIER AND SHIPPING NUMBER:	[31] SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):
Samuel Smith/CH2M HILL Kimberley Coke/CH2M HILL	Fed-Ex/868591727517	

[32] RELINQUISHED BY	DATE	TIME	[33] RECEIVED BY	DATE	TIME
Printed Name and Signature:			Printed Name and Signature:		
Samuel Smith	June 5th, 2009	1510			
Printed Name and Signature:			Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:		
				6/6/09	11:00

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Form CC1001, Rev 06/00

CH2M HILL

Tel No. (770) 604-9182
Fax No. (770) 604-9183

CHAIN-OF-CUSTODY RECORD

COC NUMBER: 0000010

1 PROJECT NAME: Naval Activity Puerto Rico	5 PROJECT NUMBER: 378718.10.02.01.07	8 LAB NAME AND CONTACT: Empirical Laboratories	11 FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 1 (Name and Company) Tom Beisel/CH2M HILL	14 RECIPIENT 1 (Address, Tel No. , and Fax No.): 1000 Abernathy Road, Atlanta GA 30328. 678.530.4033/770.604.9183
3 PROJECT PHASE/SITE/TASK: SWMU 7/8 - Soil Delineation Sampling	6 CTO OR DO NUMBER: N62470-08-D-1006	9 LAB PO NUMBER: 30024338	12 FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 2 (Name and Company) Bryan Burkingstock/CH2M HILL	15 RECIPIENT 2 (Address, Tel No. , and Fax No.): 1000 Abernathy Road, Atlanta GA 30328. 678.530.4060/770.604.9183
4 PROJECT CONTACT: Samuel Smith	7 PROJECT TEL NO AND FAX NO: 404.915.8292/770.604.9183	10 LAB TEL NO AND FAX NO: 615.345.1115/615.345.5426	13 FAX AND MAIL REPORTS/EDD TO:: RECIPIENT 3 (Name and Company)	16 RECIPIENT 3 (Address, Tel No. , and Fax No.):

25 ANALYSES REQUIRED (Include Method Numbers)

17 ITEM	18 SAMPLE IDENTIFIER	19 SAMPLE DESCRIPTION/LOCATION	20 MATRIX (see codes on SOP)	21 DATE COLLECTED	22 TIME COLLECTED	23 DATA PKG LEVEL (see codes on SOP)	24 TAT (calendar days)	Arsenic - 6010B	Select PAH's - 8270C/8270D									26 SAMPLE TYPE (see codes on SOP)	27 COMMENTS/ SCREENING READINGS 0906071	28 LAB ID (for lab's use)
1	JM04-EB03-060309	EB03	WQ	06/03/09	16:00	C/IV	14	X										N	Acetate Sleeve/7 Day Prelims	
2	JM04-EB04-060409	EB04	WQ	06/04/09	9:55	C/IV	14		X									N	Acetate Sleeve/7 Day Prelims	
3	JM04-EB05-060409	EB05	WQ	06/04/09	15:40	C/IV	14	X	X									N	Hand Auger/7 Day Prelims	-30
4	JM04-EB06-060409	EB06	WQ	06/04/09	15:40	C/IV	14		X									N	Shoe/7 Day Prelims	
5																			126 TOTAL BOTTLES	
6																				
7																				
8																				
9																				
10																				

29 SAMPLER(S) AND COMPANY: (please print)
Samuel Smith/CH2M HILL
Kimberley Coke/CH2M HILL

30 COURIER AND SHIPPING NUMBER:
Fed-Ex/868591727517

31 SAMPLES TEMPERATURE AND CONDITION UPON RECEIPT (for lab's use):

32 RELINQUISHED BY	DATE	TIME	33 RECEIVED BY	DATE	TIME
Printed Name and Signature: Samuel Smith	June 5th, 2009	1510	Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:		
Printed Name and Signature:			Printed Name and Signature:	6/6/09	11:00

Distribution: [ ] Original - Laboratory (To be returned with Analytical Report); [ ] Copy 1 - Project File; [ ] Copy 2 - PMO

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