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FINAL SAMPLING AND ANALYSIS REPORT SOLID WASTE MANAGEMENT UNITS 53 AND 54 NAVAL ACTIVITY PUERTO RICO

8/27/2001

CH2MHILL

Final

Sampling and Analysis Report
SWMUs 53 and 54

Naval Station Roosevelt Roads

RCRA/HSWA Permit No. PR2170027203

Ceiba, Puerto Rico

Prepared For

Department of the Navy
Atlantic Division
Naval Facilities Engineering Command

Norfolk, Virginia

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August 27, 2001

Prepared by

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Environmental, Inc.

CDM
Federal Programs Corp.

FINAL

SAMPLING AND ANALYSIS REPORT
SWMUs 53 AND 54

NAVAL STATION ROOSEVELT ROADS
RCRA/HSWA PERMIT NO. PR2170027203
CEIBA, PUERTO RICO

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ATLANTIC DIVISION
NAVAL FACILITIES
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TABLE OF CONTENTS

Page

LIST OF ACRONYMS AND ABBREVIATIONS v

EXECUTIVE SUMMARY ES-1

1.0 INTRODUCTION 1-1
1.1 Scope and Objectives 1-1
1.2 Report Organization 1-1

2.0 FACILITY BACKGROUND 2-1
2.1 Facility Description 2-1
2.2 SWMU 53 – Building 64 (Malaria Control Building) 2-1
2.3 SWMU 54 – Building 1914 (Former NEX Repair/Maintenance Shop) 2-2

3.0 PHYSICAL CHARACTERISTICS OF STUDY AREA 3-1
3.1 Climatology 3-1
3.2 Topography 3-2
3.3 Geology 3-2
3.3.1 Soils 3-3
3.3.2 Regional Geology 3-4
3.3.3 Site Geology SWMU 53 – Building 64 (Malaria Control Building) 3-5
3.3.4 Site Geology SWMU 54 – Building 1914 (Former NEX Repair/ Maintenance Shop) 3-5
3.4 Hydrology 3-6
3.4.1 Regional Hydrology 3-6
3.4.2 SWMU 54 Hydrology 3-8

4.0 FACILITY INVESTIGATION 4-1
4.1 Soil Sampling Procedures 4-1
4.1.1 Surface Soil Sampling Procedures 4-1
4.1.2 Subsurface Soil Sampling Procedures 4-2
4.1.3 Drilling Procedures 4-2
4.2 Groundwater Investigation Procedures 4-3
4.2.1 Temporary Monitor Well Installation Procedures 4-3
4.2.2 Groundwater Sampling Procedures 4-3
4.3 Standing Water Sampling Procedures 4-4
4.4 Wipe Sampling Procedures 4-4
4.5 Quality Assurance/Quality Control Sampling Procedures 4-5
4.6 Decontamination Procedures 4-7
4.7 Surveying 4-7
4.8 Sampling Activities SWMU 53 4-7
4.8.1 Surface Soil Investigation 4-8
4.8.2 Subsurface Soil Investigation 4-8
4.8.3 Wipe Sampling Investigation 4-9
4.9 Sampling Activities SWMU 54 4-9
4.9.1 Surface Soil Investigation 4-9
4.9.2 Subsurface Soil Investigation 4-10
4.9.3 Groundwater Investigation 4-10
4.9.4 Standing Water Investigation 4-11

TABLE OF CONTENTS
(Continued)

Page

5.0 FIELD INVESTIGATION RESULTS 5-1
5.1 Background Conditions 5-2
5.2 SWMU 53 – Building 64 (Malaria Control Building) 5-2
5.2.1 Surface Soil 5-2
5.2.2 Subsurface Soil 5-3
5.2.3 Wipe Samples 5-3
5.3 SWMU 54 – Building 1914 (Former NEX Repair/Maintenance Shop) 5-4
5.3.1 Surface Soil 5-4
5.3.2 Subsurface Soil 5-5
5.3.3 Groundwater 5-6
5.3.4 Standing Water 5-7
5.3.5 Data Comparison to 1995 Site Characterization Site 510 Report 5-7
5.4 Quality Assurance/Quality Control Sample Results 5-9
5.4.1 Equipment Rinsate Samples 5-9
5.4.2 Field Blank Samples 5-10
5.4.3 Trip Blank Samples 5-10
5.5 Data Validation 5-10

6.0 CONCLUSIONS AND RECOMMENDATIONS 6-1
6.1 Conclusions 6-1
6.1.1 SWMU 53 6-1
6.1.2 SWMU 54 6-2
6.2 Recommendations 6-3
6.2.1 SWMU 53 6-3
6.2.2 SWMU 54 6-3

7.0 REFERENCES 7-1

LIST OF APPENDICES

A Test Boring and Well Construction Records
B Chain-of-Custody Records
C Photographs from SWMUs 53 and 54
D Field Notes from the SWMU 53 and 54 Field Investigation
E Analytical Laboratory Results
F Quality Assurance/Quality Control Results
G BB&L Site 510 Characterization Report Information
H Data Validation Report Narratives

LIST OF TABLES

3-1 Summary of Groundwater Elevations – SWMU 54

4-1 Method Performance Limits Appendix IX Compound List and Contract Required Quantitation Limits (CRQL)
4-2 Summary of Well Construction Details – SWMU 54
4-3 Summary of Groundwater Field Parameters - SWMU 54
4-4 Summary of Sampling and Analytical Program – QA/QC
4-5 Summary of Sampling and Analytical Program – SWMU 53
4-6 Summary of Sampling and Analytical Program – SWMU 54
4-7 Method of Chemical Analysis Water Quality Parameters

TABLE OF CONTENTS
(Continued)

LIST OF TABLES (Cont.)

5-1 Summary of Pesticide/PCBs Detections in Surface Soil – SWMU 53
5-2 Summary of Inorganic Detections in Surface Soil – SWMU 53
5-3 Summary of Pesticide/PCBs Detections in Subsurface Soil – SWMU 53
5-4 Summary of Inorganic Detections in Subsurface Soil – SWMU 53
5-5 Summary of Pesticide/PCBs Detections in Wipe Samples – SWMU 53
5-6 Summary of Organic Detections in Surface Soil – SWMU 54
5-7 Summary of Inorganic Detections in Surface Soil – SWMU 54
5-8 Summary of Organic Detections in Subsurface Soil – SWMU 54
5-9 Summary of Inorganic Detections in Subsurface Soil – SWMU 54
5-10 Summary of Organic Detections in Groundwater – SWMU 54
5-11 Summary of (Total) Inorganic Detections in Groundwater – SWMU 54
5-12 Summary of Organic Detections in Groundwater Water Quality – SWMU 54
5-13 Summary of Organic Detections in Standing Water – SWMU 54
5-14 Summary of (Total) Inorganic Detections in Standing Water – SWMU 54
5-15 Summary of Inorganic Dectections in Equipment Rinsate Samples – SWMU 53
5-16 Summary of Organic Detections in Equipment Rinsate Samples – SWMU 54
5-17 Summary of Inorganic Detections in Equipment Rinsate Samples – SWMU 54
5-18 Summary of Organic Detections in Field Blank Samples
5-19 Summary of Inorganic Detections in Field Bland Samples

LIST OF FIGURES

2-1 Regional Location Map
2-2 SWMU/AOC Location Map
2-3 Site Location Map, SWMU 53, Building 64 (Malaria Control Building)
2-4 Site Location Map, SWMU 54, Building 1914 (NEX Repair/Maintenance Shop)

3-1 Potentiometric Surface Map, SWMU 54, Building 1914 (NEX Repair/Maintenance Shop)

4-1 Sample Locations, SWMU 53, Building 64 (Malaria Control Building)
4-2 Sample Locations, SWMU 54, Building 1914 (Former NEX Repair/ Maintenance Shop)

LIST OF ACRONYMS AND ABBREVIATIONS

ASTM	American Society of Testing Materials
bgs	Below Ground Surface
Baker	Baker Environmental, Inc.
BB&L	Blasland, Bouck & Lee, Inc.
C	Centigrade
cm	centimeter
cm/sec	centimeters per second
CRQL	Contract Required Quantitation Limit
CTO	Contract Task Order
D	Duplicate Sample
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DO	Dissolved Oxygen
DRO	Diesel Range Organics
ER/RB	Equipment Rinsate Sample
F	Fahrenheit
FB	Field Blank
ft/day	feet per day
ft/bgs	feet below ground surface
GRO	Gasoline Range Organics
IAS	Initial Assessment Study
ID	Inside Diameter
IDW	Investigation Derived Waste
LANTDIV	Naval Facilities Engineering Command, Atlantic Division
MCL	Maximum Contaminant Level
mg/d	milligrams per day
mg/L	Milligrams per Liter
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NEX	Navy Exchange
NSRR	Naval Station Roosevelt Roads
OD	outside diameter
OP	organophosphorus
PAH	Polynuclear Aromatic Hydrocarbons
PCB	polychlorinated biphenyls
PID	Photoionization Detector
PREQB	Puerto Rico Environmental Quality Board
PVC	polyvinyl chloride

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)

QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SC	Site Characterization
SOP	Standard Operating Procedures
SOW	Statement of Work
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TB	Trip Blank
TCE	Trichloroethene
TPH	Total Petroleum Hydrocarbon
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

Introduction

This document presents results from the Resource Conservation and Recovery Act (RCRA) Sampling and Analysis Plan, for Solid Waste Management Unit (SWMU) 53 and SWMU 54, Naval Station Roosevelt Roads (NSRR), Ceiba, Puerto Rico. This report is prepared under the Corrective Action provisions of the NSRR's RCRA Permit No. PR2170027203 and includes the results from the sampling and analysis investigation. This report has been prepared by Baker Environmental, Inc. (Baker) under contract to the Naval Facilities Engineering Command, Atlantic Division (LANTDIV) Contract Number N62470-95-D-6007, Contract Task Order (CTO) 099.

Scope and Objectives

The scope of the sampling and analysis plan included completion of a field investigation at both SWMUs, to determine whether a release of hazardous waste including hazardous constituents from SWMUs 53 and 54 has occurred, is likely to have occurred, or is likely to occur. This document presents the results of the sampling conducted during the field investigation. The objective of the sampling and analysis report is to present the data collected in the field, compare analytical results to various screening criteria, and determine if additional investigations are warranted for these sites through the performance of a RCRA Facility Investigation (RFI).

Facility Description

NSRR occupies over 33,500 acres on the northern side of the east coast of Puerto Rico, along Vieques Passage with Vieques Island lying to the east about 10 miles off the harbor entrance. The north entrance to NSRR is about 35 miles east along the coast road (Route 3) from San Juan. The closest large town is Fajardo (population approximately 37,000), which is about 10 miles north of NSRR off Route 3. Ceiba (population approximately 17,000) adjoins the west boundary of NSRR.

NSRR was commissioned in 1943 as a Naval Operations Base, and redesignated a Naval Station in 1957. The current primary mission of NSRR is provision of full support for Atlantic Fleet weapons training and development activities. NSRR has administrative and command responsibilities for some operations separated from the main base on Vieques Island.

SWMU 53 – Building 64 (Malaria Control Building) Description

The Malaria Control Building (Building 64) was built in 1942 and condemned in 1980. The building is presently unoccupied and lies on approximately 1/8 acre. The building structure itself is 21 feet by 18 feet in dimension, and occupies about ten percent of the total SWMU 53 acreage. This SWMU is located on a gentle slope (approximately 5-7% grade) from northeast (upgradient) to the southwest (down gradient) approximately 200 feet away from Forrestal Drive. The building was utilized to store pesticides, such as Malathion, aldrin, and dichlorodiphenyltrichloroethane (DDT). It is not known if stocks of pesticides were maintained in the building for the entire duration. Although no direct evidence exists, it is assumed that mixing and other preparation for pesticide use was also performed at the building. No wastes are known to have been disposed at the unit. There are no known releases related to this unit. No other use of the site was identified. SWMU 53 is located across Forrestal Drive from SWMU 13. The information gathered from the visual site inspection by Baker and environmental staff at NSRR, revealed that there are no known wastes dumped at this facility, nor is there any evidence of source contamination (Baker, 2000a). Baker observed signs of possible past leakage of chemicals on the storage shelves inside the building, as well as identified migration pathways along the floor leading to the outside. With this in mind, along with the activities known to have taken place at this SWMU, a site characterization was performed to determine whether a release of hazardous waste including hazardous constituents has occurred, is likely to have occurred, or is likely to occur.

SWMU 54 – Building 1914 (Former NEX Repair/Maintenance Shop) Description

The Former Navy Exchange (NEX) Repair/Maintenance Shop (Building 1914) built in 1979, is currently unoccupied and lies on approximately 1 acre of land in the Bundy Area of NSRR. The building structure and pavement covers approximately 40 percent of the total SWMU 54 acreage. This SWMU contains a slight slope to the west, and a small hill to the east approximate 100 feet in elevation. A small hill lies in the southern part of this SWMU, which is approximately 50 feet in

elevation. The building structure itself consists of a small concrete block building with a center office area and open bays on either side. The building was used to perform maintenance on vehicles including oil changes, lubrications, etc. No wastes are known to have been disposed at the unit. There are no known releases related to the unit. SWMU 54 is located across Bairoko Street from SWMU 26 and Building 1686 (Former Base Laundromat). Site 510 an underground storage tank (UST) site was located south of Building 1914. A 4,000 gallon UST associated with Building 510 was located south of Building 1914. The UST was constructed of steel and used to store fuel for fueling operations conducted in the area. It is unknown what the date of installation was and the type of fuel stored there, but it is assumed to be gasoline. In December 1992, the tank was removed from Site 510 (BB&L, July 1995).

The information gathered from the visual site inspection performed by CH2MHILL and environmental staff at NSRR revealed that there were several areas of oil stained soil around the NEX Building 1914 (CH2MHILL, February 2000). For that reason, it was recommended that a sampling program be performed to characterize the areas around several structures in the SWMU 54 area. The results from the Site Characterization for Site 510 developed by Blasland, Bouck, and Lee (BB&L) were taken into consideration in development of the work plan utilized during this investigation, due to the close proximity of its existing monitor wells to SWMU 54. CH2MHILL also observed two open excavation locations south of the building, which contained algae stained water. With this in mind, along with the activities (oil changes, lubrications, etc.) known to have taken place at this SWMU, a site characterization was performed to determine whether a release of hazardous waste including hazardous constituents has occurred, is likely to have occurred, or is likely to occur.

Site Geology SWMU 53 – Building 64 (Malaria Control Building)

Weathered bedrock was the primary stratigraphic feature observed in borings at SWMU 53. A thin surficial layer consisting of rock fragments and silt was observed to a depth of 1- to 2-feet below ground surface (bgs). Weathered bedrock rock was observed from a depth of 1- to 2-feet bgs to boring terminus (a maximum of 10-feet bgs at boring 53SB01). The weathered bedrock was observed to be mottled in appearance and generally gray or brown in color. Borings were terminated at split-spoon refusal (more than 50 blows in a 6-inch or less interval). Groundwater was not encountered during the investigation.

Site Geology SWMU 54 – Building 1914 (Former NEX Repair/Maintenance Shop)

The stratigraphy observed during the investigation consists of two distinct units, a surficial fill, and clay. The surficial fill was observed to consist of predominantly silt or fine sand, with lesser amounts of fine to coarse gravel and cinders. A trace amount of green staining was observed in the fill at one boring. Fuels typically weather to a green color. The fill was observed to be approximately 2-feet thick in both borings (surface to 2-feet bgs). BB&L observed the fill to be clay and gravel fill approximately 2- to 4-feet thick.

A predominantly clay unit was observed from 2-feet bgs to boring terminus (18- and 20-feet bgs). This clay unit was observed to contain thin silt lenses. Some thin clay-filled fractures were observed in both borings. BB&L also observed this clay unit throughout the site to a depth of approximately 45-feet (at well 510DW2). This clay is likely a saprolite. A saprolite is a soft, thoroughly decomposed rock, which is predominantly composed of clay-rich minerals. Saprolite is formed in place by chemical weathering of igneous rocks (typically in tropical climates).

SWMU 54 Hydrology

Groundwater flow beneath SWMU 54 appears to be radial, with a recharge area in the vicinity of well 510MW1. The radial flow pattern observed may be attributable to artificial recharge due to the manner in which the UST excavation was backfilled, causing the backfill to be more permeable than the surrounding clayey soils. Evidence from this investigation as well as the BB&L Site Characterization suggests that groundwater beneath SWMU 54 occurs in a low-yield (low hydraulic conductivity) aquifer with narrow relatively higher yield zones. Clay was observed to predominate in the subsurface at SWMU 54. Boring logs from the BB&L report suggest that the clays appeared only moist, substantial flow zones were not observed. Additionally, BB&L reported hydraulic conductivity to range from 0.027 feet per day (ft/day) (9.5×10^{-6} centimeters per second (cm/sec)) to 0.272 feet/day (9.6×10^{-5} cm/sec). In both temporary wells Baker personnel observed narrow flow zones (approximately 0.5 feet thick) embedded in moist clay. These zones likely correspond to fractures in the clay and would exhibit a higher hydraulic conductivity than the surrounding matrix.

Sampling Activities and Analytical Results - SWMU 53

A sampling program was conducted at SWMU 53 and included the collection of surface soil, subsurface soil and wipe samples. The surface soil investigation at SWMU 53 involved the collection of twelve soil samples and three duplicate samples. All samples were analyzed for pesticides/polychlorinated biphenyl's (PCBs) and Appendix IX metals. A total of seven subsurface samples were collected at SWMU 53. All samples were analyzed for pesticides/PCBs and Appendix IX metals. Four wipe samples (53WP01 through 53WP04) were collected inside Building 64 from areas of visible staining on the floors. These samples were collected because of possible past leakage on the storage shelves and floor. Wipe samples were analyzed for pesticides/PCBs.

A total of five pesticides: 4,4'DDD, 4,4'-DDE, 4,4'-DDT, Heptachlor, and Heptachlor epoxide were detected in the surface soil samples. All but one of the samples had positive detections of pesticides. 4,4'-DDT was the only pesticide detected which exceeded any of the screening criteria for surface soil. The residential RBC was exceeded in only one of the samples (53SS02). It should be noted that this sample was located off of the downgradient side of Building 64. No other pesticides were detected above the screening criteria. Fifteen different metals were detected in the surface soil samples. Of the fifteen different metals detected only five of them were detected in excess of the residential RBCs. These included antimony, arsenic, barium, vanadium, and zinc. It should be noted that all of the vanadium detections were below the background criteria. Four of the twelve arsenic detections were also in excess of the industrial RBCs. Lead was positively detected in excess of the USEPA soil screening value for lead in five of the eight samples, which it was detected in.

Only one pesticide: 4,4'-DDT was detected in only two of the seven subsurface soil samples. The two positive detections of 4,4'-DDT was below the screening criteria. It should be noted that these detections were from the soil borings located off of the downgradient side of Building 64. Twelve different metals were detected in the subsurface soil samples. Of the twelve different metals detected only two of them were detected in excess of the residential RBCs and below the industrial RBCs. These included arsenic and vanadium. It should be noted that all of the arsenic and vanadium detections were below the background criteria.

Four wipe samples were collected inside of Building 64. Three pesticides (4,4'-DDE, 4,4'-DDT and 4,4'-DDD) were detected.

Sampling Activities and Analytical Results - SWMU 54

A sampling program was conducted at SMWU 54 that included the collection of surface soil, subsurface soil, groundwater, and standing water samples. The surface soil investigation at SWMU 54 involved the collection of 16 surface soil samples and two duplicates. Surface soil locations around the above ground storage tank containment pad, as well as around the open storage shed were sampled to help characterize the extent of contamination, if any were to be present adjacent to the structures. The surface soil samples were analyzed for the full Appendix IX list, as well as TPH DRO and GRO.

A total of six VOCs were detected at low levels below all the screening criteria. Toluene was detected in 13 of the 16 samples at this site. The remaining VOCs were scattered sporadically across the site. Five poly-aromatic hydrocarbons (PAH) were detected from the SVOC analysis. It should also be noted that the detection limits of benzo(a)pyrene were above the residential RBC value for all 16 of the listed samples, and above the industrial RBC screening in 13 of the 16 samples. In sample 54SS07, which is located outside the fenced operation area of the site, benzo(a)pyrene was detected at an estimated concentration of 580 µg/kg, which exceeds the residential RBC of 87 µg/kg. The detection limits of benzo(a)anthracene were above the residential RBC value for all but three of the sixteen of the listed samples. Low levels of six pesticides were detected below any of the screening criteria. 4,4'-DDE, 4,4'-DDD, and 4,4-DDT were the most frequently detected throughout the site. The levels present are most likely associated with routine application of the pesticides rather than related to the site. No PCBs, OP-pesticides, or dioxins/furans were detected in any of the samples. One chlorinated herbicide (2,4,5-TP) was detected in one sample between the building and oil water separator at a low concentration below any of the screening criteria and is not related to site activities.

Diesel range organics were detected in twelve of the sixteen surface soil samples and gasoline range organics were detected in only one of the samples. All low-level positive detections were below the PREQB guidance for remediation levels of TPH in soils under the UST regulations.

A total of fourteen inorganics were detected in surface soil samples collected. Of these detections only arsenic, cadmium, chromium and vanadium were detected above the residential RBCs, however were below the industrial RBC values. Arsenic was detected in 15 of the 16 samples above the residential RBC and only three of those samples were also in excess of the background screening criteria. Vanadium was detected in all of the samples in excess of the residential RBC but below the background criteria.

A total of four subsurface soil samples were collected from the soil borings associated with two temporary monitor wells at SWMU 54. At each soil boring location continuous split spoon sampling was implemented at two-foot intervals and samples were collected from areas of suspected contamination and/or from the interval immediately above the water table. All samples were analyzed for the full Appendix IX list, as well as TPH Diesel Range Organics (DRO) and Gasoline Range Organics (GRO).

Three VOCs, one SVOCs and two pesticides were detected in the subsurface soil samples, however the detections were below both industrial and residential RBC values. One chlorinated herbicide resulted in a positive detection, again below screening values. There were no detections of PCBs, OP-Pesticides, dioxin/furans or TPH.

Thirteen different metals were detected in the four subsurface soil samples that were collected as part of this investigation. Arsenic, chromium and vanadium were detected above the residential RBC values, but below the industrial RBC values. Chromium and vanadium exceeded background screening criteria in one of the four samples, while arsenic was below background screening criteria in all four subsurface soil samples.

A total of nine groundwater samples were collected along with one duplicate sample at SWMU 54. All seven existing monitor wells from adjacent Site 510 were sampled during this investigation. According to the Site Characterization Report (BB&L, 1995), analytical results indicated that in two of the seven monitor wells (510MW1 and 510DW1), Benzene was detected in levels exceeding the Federal Maximum Contaminant Levels (MCLs). Samples were collected from the other five monitor wells to evaluate if constituents detected in 1995 have migrated laterally throughout the site, or if natural attenuation is causing decreased concentrations of contaminants to be present in the groundwater. Groundwater samples (54TW01 and 54TW02) were collected to determine if any contamination has migrated down-gradient from SWMU 54. All groundwater samples were analyzed for the full Appendix IX list. The groundwater samples (510MW1 and 510MW2) were also analyzed for groundwater quality criteria.

A total of eleven VOCs were detected in the groundwater samples that were collected. The detections were isolated to four of the monitor wells with seven of the eleven detections from monitor well 510DW1. The four wells with the positive detections are located south of the site and were associated with Site 510 and were sampled for this investigation due to the near vicinity to SWMU 54. There were no VOC s detected from the two temporary wells installed during this investigation. Six of the

VOCs detected were in excess of the EPA Region III Tap Water RBCs. Two of these VOCs (benzene and trichloroethene) were also detected above the Federal MCLs. These included 1,1-Dichloroethene, chloroform, benzene, 1,2-Dichloroethane, trichloroethane and isobutanol. Trichloroethene was detected exceeding both criteria in 510MW5.

There were 15 semivolatiles (SVOCs) detected in the groundwater samples. Six SVOCs were detected at concentrations exceeding the Tap Water RBC values in samples 510MW1 and 510MW2. Of those detections, benzo(a)pyrene also exceeded Federal MCL values in both samples. There were no positive detections for Pesticides/PCBs, OP-Pesticides, Chlorinated Herbicides or Dioxin/Furans. TPH Diesel Range Organics were detected in eight of the nine samples with values ranging from 0.2 mg/L to 6.7 mg/L. Three samples had TPH gasoline range organic detections.

Fourteen inorganic compounds detected in groundwater samples. Beryllium was detected above the Federal MCL in one sample (54TW01) while thallium was also detected above the Federal MCL in one sample 510MW2. Thallium also exceeded the tap water RBC and background screening criteria in 510MW2. Thallium was not detected in the duplicate sample nor was it detected in the other eight groundwater samples. Therefore, detections of thallium are not indicative of past releases associated with SWMU 54. Analysis for groundwater quality was conducted for two samples, 510MW1 and 510MW2. Total dissolved solids, aluminum, iron and manganese were detected exceeding Secondary MCL standards. Tap Water RBCs were also exceeded for aluminum, iron and manganese.

A total of two standing water samples (54SW01 and 54SW02) and one duplicate were collected from the two open excavation areas south of Building 1914. The standing water samples were submitted to a mainland laboratory for analysis of the full Appendix IX list, as well as TPH DRO and GRO. There were a total of fifteen SVOCs detected in the standing water samples that were collected at SWMU 54. Six of the SVOCs detected exceeded Tap Water RBC values in both samples. Of these detections, only benzo(a)pyrene exceeded both the Tap Water RBC and the Federal MCL values. Diesel range organics were detected in the sample (54SW02). The analytical results do not indicate a release of hazardous constituents from this SWMU. The results are most likely associated with the exhaust from vehicular traffic in the area. There was not any detection of VOCs, pesticides/PCBs, op-pesticides, chlorinated herbicides or dioxin/furans. Three metals were detected in the standing water samples. Barium, copper and vanadium were detected below the Federal MCL and Tap Water RBC values in both samples.

It should be noted that this round of sampling indicates that contaminant concentrations of BTEX in the groundwater have decreased substantially from the results reported in the 1995 Site Characterization Site 510 Report (BB&L, 1995). In the conclusions and recommendations section of the BB&L report, it was stated that natural degradation processes were expected to continue to reduce the levels of petroleum contaminants in the soils and groundwater at the site (BB&L, 1995). The December 2000 sampling results show substantial decreases in contaminant levels. For example, the 1992 laboratory results indicated that TPH was present in soil samples obtained from the UST excavation in concentrations greater than the PREQB target level of 100 mg/kg. However, TPH was not detected above 100 mg/kg in any of the 19 soil samples analyzed for TPH during the 1995 BB&L Site Characterization (SC) Investigation. The BB&L report also stated that contamination seemed to be limited to the area of the former UST location.

It appears that natural degradation is reducing the levels of TPH and BTEX in the groundwater, in addition to the soil discussed above. For example, in the groundwater from 510DW1, benzene decreased from 4,800 μg/L in the 1995 sampling event, to 91 μg/L in the December 2000 sampling event. Likewise, in 510MW1, benzene decreased from 69 μg/L (1995 sampling event) to below detection levels (2000 sampling event), and in 510DW2 from 2.4 μg/L (1995 sampling event) to below detection levels (2000 sampling event). Total BTEX also decreased substantially from 7,590 μg/L in monitor well 510DW1 (1995 sampling event) to 145.7 μg/L in December of 2000. Concentrations for Total BTEX also decreased in 510DW2 from 11.8 μg/L (1995 sampling event) to below detection levels (2000 sampling event), and from 284 μg/L (1995 sampling event) to below detection levels (2000 sampling event) in sample location 510MW1. TPH was only detected in one monitor well, 510DW1, and it decreased from 6.1 mg/L in the 1995 sampling event to 2.04 mg/L in December of 2000. In addition, the temporary wells sampled in the December 2000 investigation did not have any positive organic detection except for two minor SVOC detections, which were below any of the screening criteria.

The only detections in the two standing water samples were those from the SVOC analysis. A few of the constituents exceeded the tap water RBC. It is highly unlikely that this small quantity of water would be utilized as a drinking water source. The level at which the constituents were detected do not indicate a release of hazardous constituents from this SWMU, rather it is most likely associated with the exhaust from vehicular traffic in the area.

Polynuclear aromatic hydrocarbons (PAHs) are a group of compounds with two or more fused aromatic rings. EPA has identified 16 PAHs as priority pollutants and seven of these are identified by EPA as probable human carcinogens. PAHs are ubiquitous chemicals produced by natural processes such as forest fires and volcanoes and anthropogenic processes including burning of fossil fuels.

Studies of urban background soils report concentrations from 0.06 to 5.8 mg/kg total carcinogenic PAHs (Menzie et al, 1992) and mean concentrations of 9 mg/kg carcinogenic PAHs and 18.4 total PAHs (Bradley et al, 1994). PAHs were also detected in surface water and groundwater background data (Menzie et al, 1992). In the standing water samples from SWMU 54 the two most commonly detected PAHs (naphthalene and 2-methylnaphthalene) were not detected even though they are more soluble than the detected PAHs by a factor between 30 and 40,000. Furthermore, duplicate samples of standing water sample 54SW01 and groundwater from 510MW2 show poor reproducibility of the data suggesting that the low levels detected are also uncertain.

Conclusions

SWMU 53

A review of the analytical data indicates that it is likely there was a release of contaminants to the surface soils in the vicinity of the malaria control building. It is known that 4,4'-DDT was stored inside the building, and it has been detected in all but one of the surface soil samples around Building 64. Only one of the detections was in excess of the residential RBC. The highest detections were isolated to the downgradient side of the site. 4,4-DDT was the only pesticide detected in the subsurface soils and was detected in only two of the seven samples. These detections were below the screening criteria. Both of these samples were also collected on the downgradient side of the site. 4,4'-DDT adsorbs very strongly to soil and is subject to evaporation and photodegradation at the surface of soils. It will not leach appreciably to groundwater or hydrolyze (Spectrum Laboratories, 2001). Lead and arsenic were detected above their respective screening criteria in several of the surface soil samples collected. The maximum concentrations of lead and arsenic were primarily detected on the eastern and western sides of Building 64. Arsenic was also detected above the residential RBC in the subsurface soil. Bedrock underlies the entire site at depths ranging from 4.5 to 10 feet below ground surface with groundwater below the subsurface soils (see Section 3.3.3).

Groundwater was not encountered during the investigation due to split-spoon refusal at the subsurface soils bedrock interface. As such groundwater underlying SWMU 53 is not in contact with the soils at the site. The results from this investigation indicate the presence of pesticides, as well as arsenic and lead in surface soils in the vicinity of Building 64. Also, wipe samples taken from the inside of Building 64 show pesticides were also detected on the floor of the unoccupied building, a direct result of prior use of the building for storing/mixing pesticides.

SWMU 54

Results from analytical data associated with soil at SWMU 54 showed minor detections of various constituents in the surface and subsurface soil samples, the majority of them below any of the RBCs. Only one surface soil sample had an exceedance of the residential RBC for organics, this constituent was benzo(a)pyrene from a sample outside the fenced area of site operations. The detections of inorganic constituents in the surface soil were below the industrial RBCs in all sixteen samples. However, arsenic, cadmium and vanadium had exceedances of residential RBCs in all samples, except in sample 54SS01 for arsenic. Background screening levels were exceeded in all 16 of the cadmium samples, 13 out of 16 of the lead samples and 15 out of 16 of the nickel samples in the surface soil.

Of the four subsurface samples collected none of the samples exceeded inorganic industrial RBCs. However, arsenic exceeded residential RBCs in 3 out of 4 samples, chromium in 2 out of 4 and vanadium in all four samples. Arsenic was below the background screening for all samples, while chromium and vanadium were below background levels in 3 our of 4 samples each.

The results from the groundwater portion of the investigation indicate that there has been a release of TCE in the vicinity of SWMU 54. The TCE contamination will be evaluated during the RFI stage. The other groundwater contaminants observed during this investigation are believed to be related to the former UST associated with Building 510. However, results comparing the data collected during this report compared to 1995 data indicate natural attenuation of the groundwater is occurring, decreasing the concentration of petroleum related contaminants. None of the inorganics detected in the standing water were in excess of the screening criteria.

Low levels of PAHs (at estimated concentrations less than the analytical method detection limit) were detected in soil, groundwater, and in standing water from SWMU 54 as discussed in Section 5.3. This data is considered more likely to represent anthropogenic background than site-related contamination. It is likely that the PAHs in the standing water are from low level concentrations of PAHs that have adsorbed to suspended sediments in the water.

Recommendations

SWMU 53

It is recommended that a RCRA Facility Investigation be conducted at this SWMU to delineate the 4,4'-DDT, lead, and arsenic contamination in the surface and subsurface soils. 4,4'-DDT adsorbs very strongly to soil and is subject to evaporation and photodegradation at the surface of soils. It will not leach appreciably to groundwater or hydrolyze (Spectrum Laboratories, 2001). Bedrock underlies the entire site at depths ranging from 4.5 to 10 feet below ground surface with groundwater below the subsurface soils (see Section 3.3.3). Groundwater was not encountered during the investigation due to split-spoon refusal at the subsurface soils bedrock interface. As such groundwater underlying SWMU 53 is not in contact with the soils at the site.

SWMU 54

It is recommended that the standing water is removed from the open excavation at the site and be properly disposed of followed by backfilling the excavations. It is also recommended that a RCRA Facility Investigation be conducted at this SWMU to further investigate the presence of TCE in groundwater. The results presented in the BB&L report (BB&L, 1995) and this report indicate that natural biodegradation is effectively remediating the contaminants associated with Site 510. Therefore, further investigations related to those particular contaminants are not warranted at this time.

1.0 INTRODUCTION

This document presents results from the Resource Conservation and Recovery Act (RCRA) Sampling and Analysis Plan, for Solid Waste Management Unit (SWMU) 53 and SWMU 54, Naval Station Roosevelt Roads (NSRR), Ceiba, Puerto Rico. This report is prepared under the Corrective Action provisions of the NSRR's RCRA Permit No. PR2170027203 and includes the results from the sampling and analysis investigation as described in Section 1.1. This report has been prepared by Baker Environmental, Inc. (Baker) under contract to the Naval Facilities Engineering Command, Atlantic Division (LANTDIV) Contract Number N62470-95-D-6007, Contract Task Order (CTO) 099.

1.1 Scope and Objectives

The scope of the sampling and analysis plan included completion of a field investigation at both SWMUs, to determine whether a release of hazardous waste including hazardous constituents from SWMUs 53 and 54 has occurred, is likely to have occurred, or is likely to occur. This document presents the results of the sampling conducted during the field investigation. The objective of the sampling and analysis report is to present the data collected in the field, compare analytical results to various screening criteria, and determine if an additional investigation is warranted for these sites through the performance of a RCRA Facility Investigation (RFI).

1.2 Report Organization

Section 1.0 of this document includes the introduction and the scope and objectives of this Sampling and Analysis Report. Section 2.0 provides a description of the facility as well as descriptions of SWMUs 53 and 54. Section 3.0 provides a description of the physical characteristics (i.e., climatology, topography, geology, and hydrology) of NSRR, as well as SWMUs 53 and 54 where appropriate. Section 4.0 describes the field activities undertaken during the sampling and analysis investigation. It also describes the purpose of the study of individual media, sampling procedures, sampling locations for all media and quality control (QC) conducted during sampling activities. Section 5.0 discusses the nature and extent of contamination detected in the environmental samples from each media sampled at SWMUs 53 and 54. A summary of findings and conclusions are presented in Section 6.0 along with recommendations for SWMUs 53 and 54. The report references are listed in Section 7.0.

2.0 FACILITY BACKGROUND

This section contains a description of the physical layout and a background history of NSRR, as well as a description of the physical layout of SWMUs 53 and 54.

2.1 Facility Description

NSRR occupies over 33,500 acres on the northern side of the east coast of Puerto Rico, along Vieques Passage with Vieques Island lying to the east about 10 miles off the harbor entrance. The north entrance to NSRR is about 35 miles east along the coast road (Route 3) from San Juan. The closest large town is Fajardo (population approximately 37,000), which is about 10 miles north of NSRR off Route 3. Ceiba (population approximately 17,000) adjoins the west boundary of NSRR (see Figure 2-1).

NSRR was commissioned in 1943 as a Naval Operations Base, and redesignated a Naval Station in 1957. The current primary mission of NSRR is provision of full support for Atlantic Fleet weapons training and development activities. NSRR has administrative and command responsibilities for some operations separated from the main base on Vieques Island.

2.2 SWMU 53 – Building 64 (Malaria Control Building)

The Malaria Control Building (Building 64) was built in 1942 and condemned in 1980. The building is presently unoccupied and lies on approximately 1/8 acre. The building structure itself is 21 feet by 18 feet in dimension, and occupies about ten percent of the total SWMU 53 acreage. This SWMU is located on a gentle slope (approximately 5-7% grade) from northeast (upgradient) to the southwest (down gradient) approximately 200 feet away from Forrestal Drive. The building was utilized to store pesticides, such as malathion, aldrin, and dichlorodiphenyltrichloroethane (DDT). It is not known if stocks of pesticides were maintained in the building for the entire duration. Although no direct evidence exists, it is assumed that mixing and other preparation for pesticide use was also performed at the building. No wastes are known to have been disposed at the unit. There are no known releases related to this unit. No other use of the site was identified. SWMU 53 is located across Forrestal Drive from SWMU 13, as presented on Figures 2-2 and Figure 2-3. The information gathered from the visual site inspection by Baker and environmental staff at NSRR, revealed that there are no known

wastes dumped at this facility, nor is there any evidence of source contamination (Baker, 2000a). Baker observed signs of possible past leakage of chemicals on the storage shelves inside the building, as well as identified migration pathways along the floor leading to the outside. With this in mind, along with the activities known to have taken place at this SWMU, a site characterization was performed to determine whether a release of hazardous waste including hazardous constituents has occurred, is likely to have occurred, or is likely to occur.

2.3 SWMU 54 – Building 1914 (Former NEX Repair/Maintenance Shop)

The Former NEX Repair/Maintenance Shop (Building 1914) built in 1979, is currently unoccupied and lies on approximately 1 acre of land in the Bundy Area of NSRR. The building structure and pavement covers approximately 40 percent of the total SWMU 54 acreage. This SWMU contains a slight slope to the west, and a small hill to the east approximate 100 feet in elevation. A small hill lies in the southern part of this SWMU, which is approximately 50 feet in elevation. The building structure itself consists of a small concrete block building with a center office area and open bays on either side. The building was used to perform maintenance on vehicles including oil changes, lubrications, etc. No wastes are known to have been disposed at the unit. There are no known releases related to the unit. SWMU 54 is located north north-east across Bairoko Street from SWMU 26 and west across Bairoko Street from Building 1686 (Former Base Laundromat), as presented on Figure 2-4. Site 510 an underground storage tank (UST) site was located south of Building 1914 as shown on Figure 2-4. A 4,000 gallon UST associated with Building 510 was located south of Building 1914. The UST was constructed of steel and used to store fuel for fueling operations conducted in the area. It is unknown what the date of installation was and the type of fuel stored there, but it is assumed to be gasoline. In December 1992, the tank was removed from Site 510 (BB&L, July 1995).

The information gathered from the visual site inspection performed by CH2MHILL and environmental staff at NSRR revealed that there were several areas of oil stained soil around the NEX Building 1914 (CH2MHILL, February 2000). For that reason, it was recommended that a sampling program be performed to characterize the areas around several structures in the SWMU 54 area. The results from the Site Characterization for Site 510 developed by Blasland, Bouck, and Lee (BB&L, July 1995) were taken into consideration in development of the work plan utilized during this investigation, due to the close proximity of its existing monitor wells to SWMU 54. CH2MHILL also observed two open

excavation locations south of the building, which contained algae stained water. With this in mind, along with the activities (oil changes, lubrications, etc.) known to have taken place at this SWMU, a site characterization was performed to determine whether a release of hazardous waste including hazardous constituents has occurred, is likely to have occurred, or is likely to occur.

SECTION 2.0
FIGURES

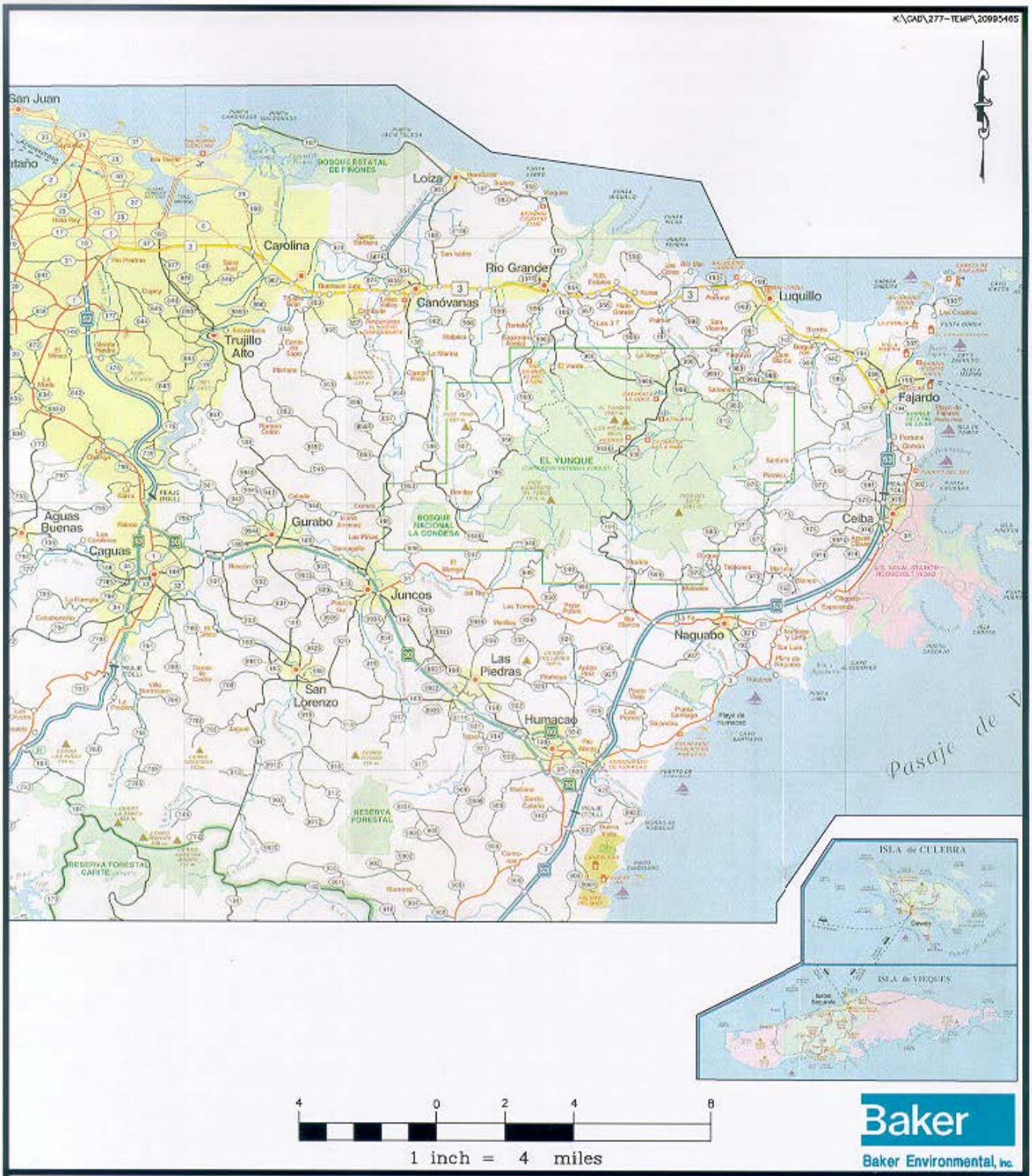
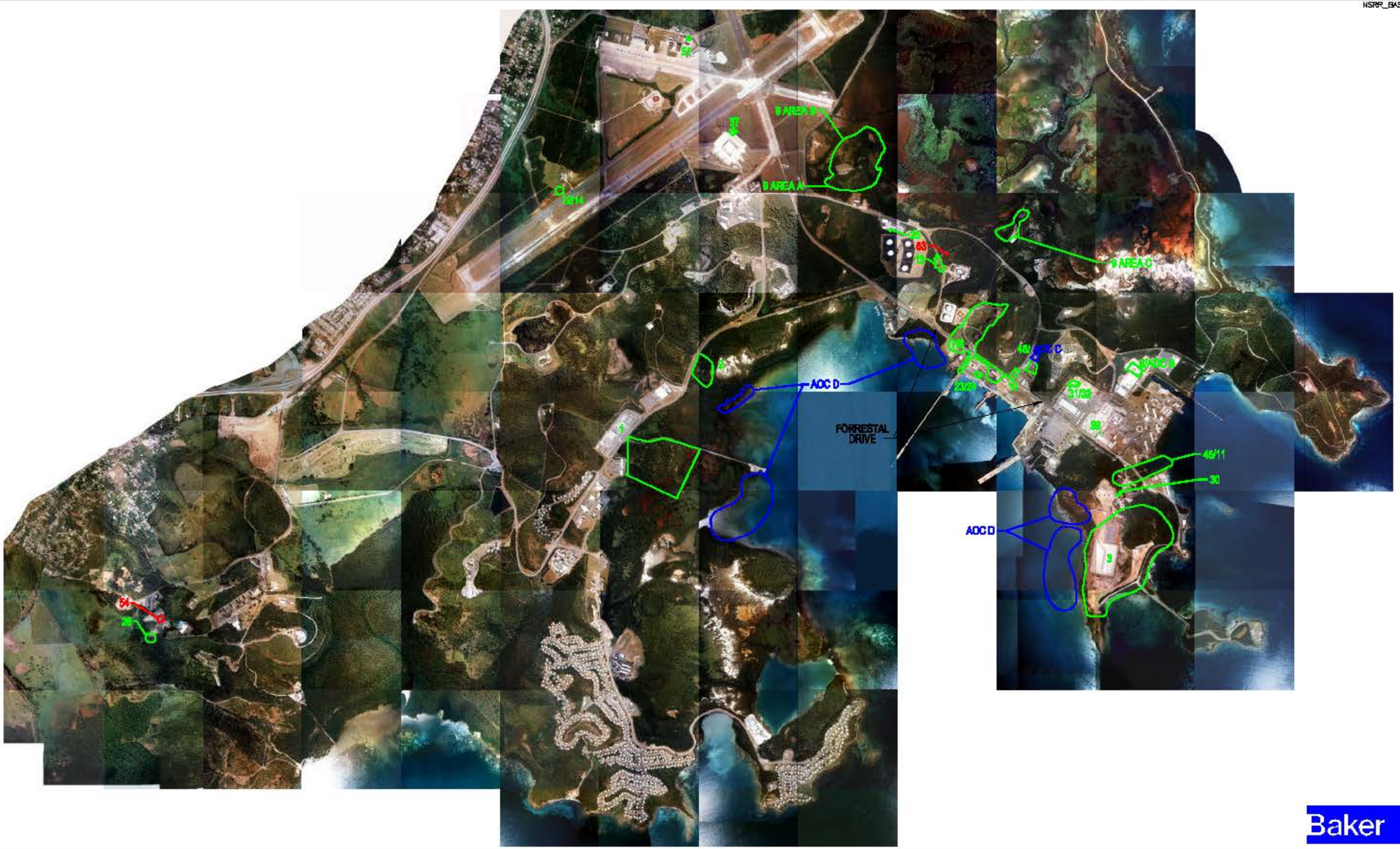


FIGURE 2-1
REGIONAL LOCATION MAP

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SOURCE: METRODATA, INC., 1999.



LEGEND

1 – SWMUs

53 – AREA OF WHICH THIS INVESTIGATION PERTAINS TO

AOC D – AOCs

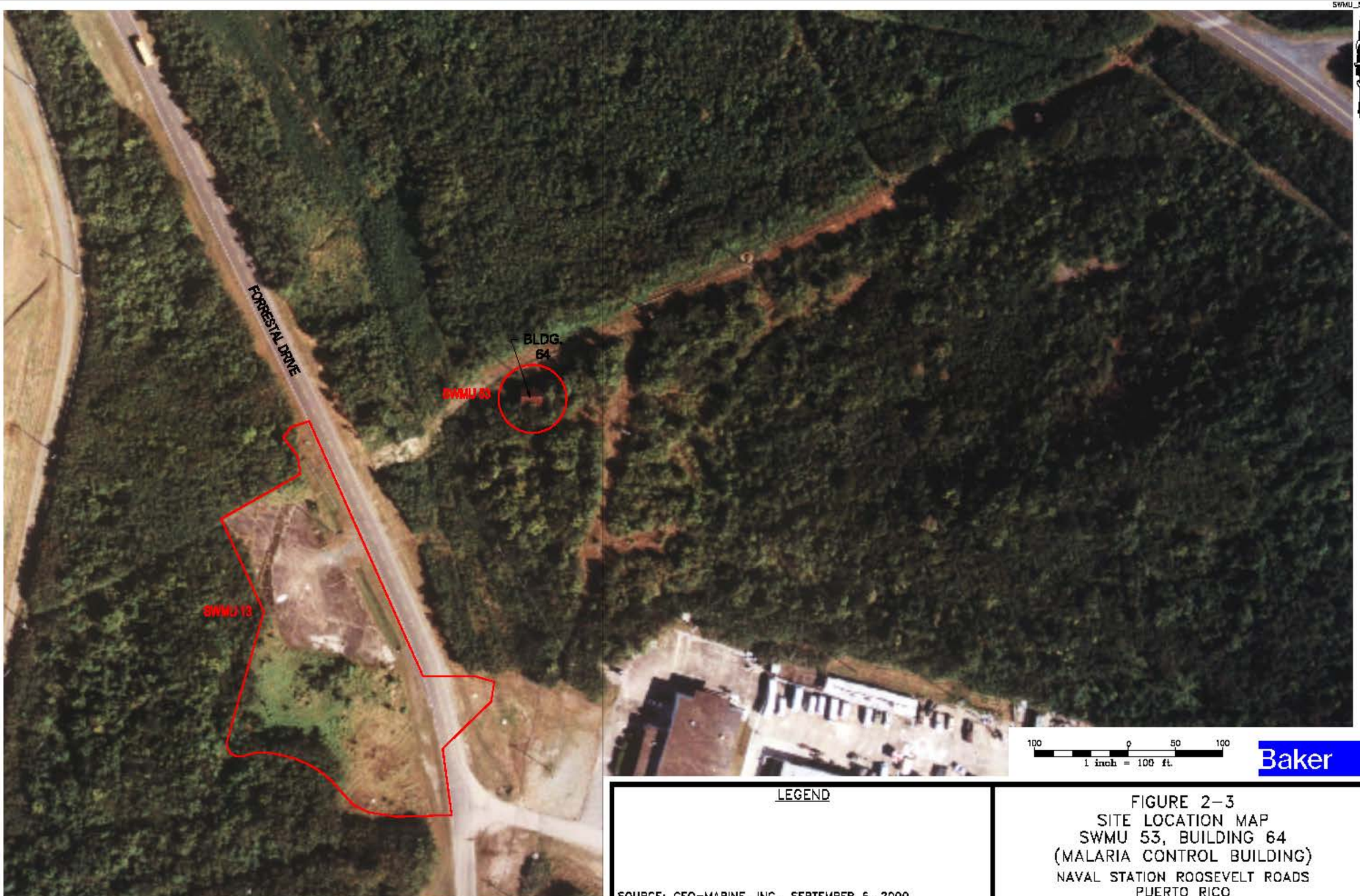
SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

2500 0 1250 2500

1 inch = 2500 ft.

FIGURE 2-2
SWMU/AOC LOCATION MAP

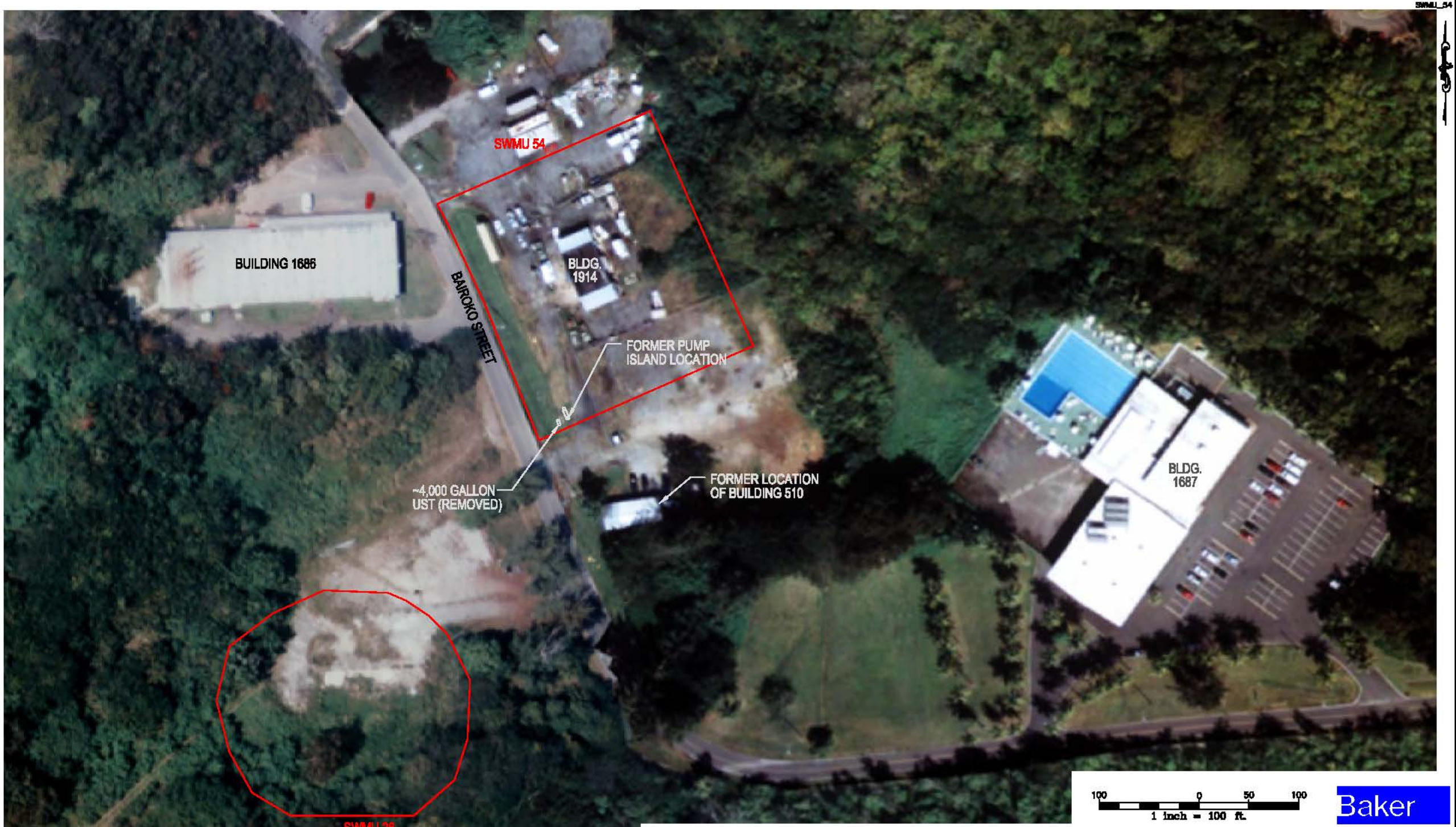
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO



LEGEND

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

FIGURE 2-3
SITE LOCATION MAP
SWMU 53, BUILDING 64
(MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO



Baker

LEGEND

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

FIGURE 2-4
SITE LOCATION MAP
SWMU 54, BUILDING 1914
(NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

3.0 PHYSICAL CHARACTERISTICS OF STUDY AREA

The physical setting of NSRR was documented in the 1984 Initial Assessment Study (IAS) (NEESA Document 13-051). This information is summarized below.

3.1 Climatology

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

Uniform temperatures prevail, with small diurnal ranges as a result of insular exposure and the relatively small land areas. The warmest months are August and September, while the coolest are January and February. Mean annual maximum temperatures range from 82.0 ^{o} Fahrenheit (F) in January to 88.2^{o} F in August. The mean annual minimum temperatures vary from 64.0 ^{o} F in January to 73.2 ^{o} F in June. The highest maximum temperature recorded was 95 ^{o} F, while the lowest minimum was 59 ^{o} F. Rain usually occurs at least nine days in every month, with an average of 60 inches per year although a dry winter season occurs from December through April. About 22 thunderstorm-days occur per year, with maximum frequencies of three days per month from May through October.

In late summer, the mean sky cover begins a steady decrease from a monthly maximum average of 6.5-tenths coverage in September to a minimum monthly average of 4.4-tenths coverage in February. From March through August, the monthly average clouds over increases steadily from 4.5- to 6.0-tenths coverage during the period. Over the open sea, a maximum of clouds (usually broken

stratocumulus) occurs during early morning, with the skies clearing or becoming scattered with cumulus by afternoon. Completely clear or overcast skies are rare during daylight hours, while clear skies frequently occur at night.

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

3.2 Topography

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

In the immediate area of the station, elevations range from sea level to approximately 295 feet. Immediately to the north of the NSRR boundary, the hills rise abruptly to heights of 800 to 1,050 feet above sea level, with the tallest peak located within two kilometers of the station boundary. There is a series of three hilly areas on the station, two of which separate the southern airfield area from the Port/Industrial, Housing and Personnel Support areas. The third set of hills is in the Bundy area. These ridgelines not only separate sections of the station, but also dictate the degree of allowable development. The ridgeline south of the airfield provides an excellent barrier which effectively decreases the aircraft-generated noise which reaches the Unaccompanied Enlisted Personnel Housing areas to an acceptable level. Relief is low along the shoreline. Lagoons and mangrove swamps are common.

3.3 Geology

The following subsections present a description of the general geology at NSRR and site-specific geologic information obtained at SWMUs 53 and 54.

3.3.1 Soils

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

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

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

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

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

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

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

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

3.3.2 Regional Geology

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

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

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

3.3.3 Site Geology SWMU 53 – Building 64 (Malaria Control Building)

Weathered bedrock was the primary stratigraphic feature observed in borings at SWMU 53 (refer to test boring construction records in Appendix A.1). A thin surficial layer consisting of rock fragments and silt was observed to a depth of 1- to 2-feet below ground surface (bgs). Weathered bedrock rock was observed from a depth of 1- to 2-feet bgs to boring terminus (a maximum of 10-feet bgs at boring 53SB01). The weathered bedrock was observed to be mottled in appearance and generally gray or brown in color. Borings were terminated at split-spoon refusal (more than 50 blows in a 6-inch or less interval). Groundwater was not encountered during the investigation.

3.3.4 Site Geology SWMU 54 – Building 1914 (Former NEX Repair/Maintenance Shop)

The stratigraphy observed during the investigation consists of two distinct units, a surficial fill, and clay. Only two borings were advanced in SWMU 54 as part of this investigation. However, observations correlate well with those of the more-extensive site characterization of Site 510 (BB&L, July 1995). The paragraphs that follow describe site stratigraphy based on the 2000 Baker investigation, supplemented with information from the BB&L study.

The surficial fill was observed to consist of predominantly silt or fine sand, with lesser amounts of fine to coarse gravel and cinders (refer to test boring and well construction records in Appendix A.2). A trace amount of green staining was observed in the fill at boring 54TW02. Fuels typically weather to a green color. The fill was observed to be approximately 2-feet thick in both borings (surface to 2-feet bgs). BB&L observed the fill to be clay and gravel fill approximately 2- to 4-feet thick.

A predominantly clay unit was observed from 2-feet bgs to boring terminus (18- and 20-feet bgs). This clay unit was observed to contain thin silt lenses in boring 54TW01. Some thin clay-filled fractures were observed in both borings. BB&L also observed this clay unit throughout the site to a depth of approximately 45-feet (at well 510DW2). This clay is likely a saprolite. A saprolite is a soft, thoroughly decomposed rock, which is predominantly composed of clay-rich minerals. Saprolite is formed in place by chemical weathering of igneous rocks (typically in tropical climates).

3.4 Hydrology

The following sections present a description of the hydrologic conditions that exist at NSRR. Both regional conditions and site-specific conditions at SWMU 53 are discussed.

3.4.1 Regional Hydrology

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

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

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

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

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

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

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

The single potable water supply system provides water to all industrial operations at the facility. The water supply is low in hardness, and, therefore, is an excellent source for industrial uses, particularly in boiler operation and maintenance.

Three hundred acres are used for pasture near Gate 1, and are irrigated as needed. Extensive sprinkling of lawns and green areas is evident throughout the base.

3.4.2 SWMU 54 Hydrology

Groundwater was encountered during the SWMU 54 investigation. Groundwater was measured in the permanent and temporary wells between 4 to 16-feet below top of casing. Based on depth to groundwater information as presented in Table 3-1, a potentiometric surface map was generated (Figure 3-1).

Groundwater flow beneath SWMU 54 appears to be radial, with a recharge area in the vicinity of well 510MW1 (Figure 3-1). The radial flow pattern observed may be attributed to artificial recharge due to the manner in which the UST excavation was backfilled, causing the backfill to be more permeable than the surrounding clayey soils. This map was based on a composite of groundwater levels collected over a one-week period. This groundwater flow direction is consistent with that observed by BB&L during their study. It should be noted that hydraulic gradient cannot be realistically inferred from Figure 3-1 because water levels were measured on different days. Information from the BB&L study however, suggests a fairly consistent hydraulic gradient across the site (0.008 to 0.01 feet/foot).

Evidence from this investigation as well as the BB&L Site Characterization suggests that groundwater beneath SWMU 54 occurs in a low-yield (low hydraulic conductivity) aquifer with narrow relatively higher yield zones. Clay was observed to predominate in the subsurface at SWMU 54. Boring logs from the BB&L report suggest that the clays appeared only moist, substantial flow zones were not observed. Additionally, BB&L reported hydraulic conductivity to range from 0.027 feet per day (ft/day) (9.5×10^{-6} centimeters per second (cm/sec)) to 0.272 feet/day (9.6×10^{-5} cm/sec). In both temporary wells Baker personnel observed narrow flow zones (approximately 0.5 feet thick) embedded in moist clay. These zones likely correspond to fractures in the clay and would exhibit a higher hydraulic conductivity than the surrounding matrix.

SECTION 3.0 TABLES

TABLE 3-1

SUMMARY OF GROUNDWATER ELEVATIONS
SWMU 54 - BUILDING 1914 (NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Well No.	Date Collected	Top of Casing Elevation (feet msl)	Ground Surface Elevation (feet msl)	Depth to Water (feet bgs)	Groundwater Elevation (feet msl)
510MW1	12/15/00	22.59[(1)]	NA	4.97	17.62
510MW2	12/19/00	22.94[(1)]	NA	15.64	7.30
510MW3	12/18/00	22.92[(1)]	NA	11.10	11.82
510MW4	12/15/00	21.56[(1)]	NA	8.10	13.46
510MW5	12/21/00	25.30[(1)]	NA	13.15	12.15
510DW1	12/18/00	22.80[(1)]	NA	10.75	12.05
510DW2	12/18/00	22.76[(1)]	NA	10.75	12.01
54TW01	12/19/00	118.13[(2)]	NA	11.80	6.33[(3)]
54TW02	12/19/00	118.22[(2)]	NA	11.09	7.13[(3)]

Notes:
bgs = below ground surface
msl = mean sea level
NA = Not Available

[(1)] - Elevation in reference to the Daguao Station elevation of 17.51 ft msl.
[(2)] - Elevation in reference to the Mean Low Water Datum = 100 Ft. as established by the US Navy Survey Section as of November 1941.
[(3)] - Elevations were adjusted to the Mean Low Water Datum = 100 Ft. as established by the US Navy Survey Section as of November 1941.

SECTION 3.0
FIGURES

K:\28007\099PHASE\NEWSWMU\2099709W

SWMU 54

DENSE FOLIAGE
(SECONDARY GROWTH VEGETATION)

BLDG. 1686

54SS14
54SS13
AST CONTAINMENT PAD
54SS12
54SS15
54SS02
54SS03
54SS11
TRANSFORMER STORAGE AREA
54SS01
CANOPY
BLDG. 1914
CANOPY
54TW01
OIL/WATER SEPARATOR
54SS10
OPEN STORAGE SHED
CANOPY POSTS
54SS04
54SS05
54SS09
54SS06
54TW02
54SW01
54SS08
54SW02
OPEN EXCAVATIONS
510MW4
13.46'
54SS07
510MW5
12.15'
BAIRKOKO STREET
510MW3
11.82'
510MW1
17.62'
FORMER PUMP ISLAND LOCATION
~4,000 GALLON UST (REMOVED)
FORMER LOCATION OF BUILDING 510
510MW2
7.50'

10 15 14 13 16 12 11 10 9 20

60 0 30 60
1 inch = 60 ft.

Baker
Baker Environmental Inc.

DENSE FOLIAGE
(SECONDARY GROWTH VEGETATION)

SWMU 26

SOURCE: DEPT. OF THE NAVY, SEPTEMBER 1999.

LEGEND

- 12 — LINE OF EQUAL ELEVATION
- GROUNDWATER FLOW DIRECTION
- SURFACE SOIL SAMPLE LOCATION
- EXISTING MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- TEMPORARY SHALLOW WELL LOCATION/ SUBSURFACE SOIL LOCATION
- TRANSFORMER STORAGE PALLETS
- GROUND SURFACE CONTOUR LINE
- FENCE LINE
- BUILDING
- TREE LINE
- EDGE OF GRAVEL

FIGURE 3-1
POTENTIOMETRIC SURFACE MAP
SWMU 54, BUILDING 1914
(NEX REPAIR/MAINTENANCE SHOP)

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

4.0 FIELD INVESTIGATION

The following sections present a description of the procedures utilized, as well as the environmental field investigation activities conducted at SWMUs 53 and 54. All investigations performed and the methodologies used were in accordance with the approved Draft Sampling and Analysis Plan (Baker, 2000b).

4.1 Soil Sampling Procedures

The following subsections present a description of the surface and subsurface soil sampling procedures utilized during the field investigation at SWMUs 53 and 54.

4.1.1 Surface Soil Sampling Procedures

At SWMUs 53 and 54, the surface soil samples were acquired following the appropriate Baker Standard Operating Procedures (SOPs) mentioned in the United States Environmental Protection Agency (USEPA) approved 2000 Draft Sampling and Analysis Plan (Baker, 2000b). At SWMU 54, it was not possible to obtain samples in the 0-1 foot below ground surface (bgs) range using conventional surface soil sampling methods, due to the presence of hard compacted gravel and soil. Therefore, a pick was utilized to break through the compacted gravel and soil layer so a representative soil sample could be collected to a depth of one foot bgs.

Samples were collected using either new or decontaminated stainless steel spoons. Prior to sample collection, vegetation (grass and roots) was removed from the location. Surface soil samples were collected to a depth of one foot bgs as required by EPA Region II guidelines. Surface soils collected for Volatile Organic Compounds (VOC) analysis (SWMU 54 only), were placed directly into the laboratory prepared container without homogenizing to prevent volatilization. Surface soils collected for other analyses were placed in their respective containers beginning with Semivolatile Organic Compounds (SVOC) followed by the rest of the Appendix IX list, and lastly inorganic analyses (metals, sulfides, and cyanide). Table 4-1 presents the Appendix IX list mentioned above. Samples were kept in coolers on ice and under strict chain-of-custody until delivered to the laboratory. Chain-of-custody forms for environmental media samples are provided as Appendix B.

4.1.2 Subsurface Soil Sampling Procedures

Subsurface soil samples were collected during this investigation from soil boreholes and temporary monitor well boreholes. Samples from the soil boreholes and monitor well boreholes were collected using nominal two-inch (SWMU 53) and three-inch outside diameter (OD) (SWMU 54) split-spoons in accordance with the American Society of Testing Materials (ASTM) D-1586 Methods. After the split-spoons were removed from the borehole, they were opened and immediately screened using a photoionization detector (PID). Each soil sample was then tightly wrapped in aluminum foil and labeled until completion of the boring. The samples selected for analysis (based on the criteria contained within the approved work plans) were opened and representative portions placed directly into the laboratory prepared sample container labeled for VOCs (SWMU 54 only) using decontaminated stainless steel spoons. The remaining sample was then homogenized in the aluminum foil and placed into containers beginning with the organic analyses and ending with the inorganic analyses. Since no VOC analysis was conducted at SWMU 53, all samples collected were homogenized in aluminum foil and placed directly in their appropriate containers with organic analysis first, and ending with the inorganic analysis. Samples were kept in coolers on ice and under strict chain-of-custody until delivered to the laboratory. Chain-of-custody forms for environmental media samples are provided as Appendix B.

4.1.3 Drilling Procedures

Drilling operations were performed using a Mobile B-61 truck mounted drill rig. The soil borings were advanced using 4-1/4 inch inside diameter (ID) hollow-stem augers. Soil samples at SWMU 53 were collected continuously (at 2-foot intervals) using 2-inch outside diameter (OD) split-spoons. Subsurface soil samples were collected from the ground surface to spoon or auger refusal. The water table at SWMU 53 was never encountered. Soil samples at SWMU 54 were collected continuously (at 2-foot intervals) using 3-inch OD split-spoons. Subsurface soil samples were collected from the ground surface to the water table. Once the water table was encountered, samples were collected at intervals selected by the Baker Field Geologist based on the criteria contained within the approved work plan. Borehole information pertaining to soil classification, environmental sampling depths, and depth to groundwater measurements were recorded on Soil Boring and Well Construction Records (refer to Appendix A). Boring logs from SWMU 54 will be used in conjunction with boring logs from the Site Characterization Report for Site 510, as a tool if future work is to be conducted at this

SWMU. The drilling and soil sampling activities were performed in Level D personal protective equipment. Decontamination fluids generated during the investigation were containerized by Baker, and will be disposed of offsite once analytical results have been received and analyzed by Baker. Soil investigation derived waste (IDW) was returned to the borehole according to the EPA approved work plans (Baker, 2000b).

4.2 Groundwater Investigation Procedures

The groundwater investigation included the sampling of two new temporary monitor wells and seven existing monitor wells at SWMU 54. Each of these activities is discussed in the following subsections.

4.2.1 Temporary Monitor Well Installation Procedures

Two temporary monitor wells were installed at SWMU 54. Each temporary monitor well was installed in an approximately 8-inch borehole. These temporary monitor wells were screened across the watertable (i.e., a portion of the monitor well screen is above the level of the groundwater surface) to facilitate monitoring of the upper zone of the uppermost aquifer. Temporary monitor wells were constructed of 2-inch nominal inside diameter, Schedule 40, flush-joint and threaded polyvinyl chloride (PVC) casing, screen (10 foot long with 0.010-inch slots), and a threaded bottom cap. The PVC riser was terminated approximately 2 feet above the level of the surrounding ground surface. Table 4-2 presents a summary of the soil boring and well construction details.

4.2.2 Groundwater Sampling Procedures

Prior to groundwater sampling, water level measurements were collected from the seven existing monitor wells, as well as the two temporary monitor wells, in order to calculate well volumes. A minimum of three to five well volumes were purged from each well using a disposable Teflon bailer and clean rope prior to sampling. Measurements of pH, temperature, specific conductance, turbidity, and dissolved oxygen (DO) were obtained prior to purging and after each well volume to ensure the parameters stabilized before sampling, as presented in Table 4-3. Purging was considered complete when three successive measurements were within 10 percent of each other or a total of five well volumes were purged from the well. The purging at temporary well (54TW01) was considered

complete after one volume because the well bailed dry. This temporary well was given time to recharge before sample collection. The purging at monitor well (510MW1) was not considered complete until six volumes were collected to allow additional time for the turbidity to decrease.

Groundwater samples were introduced into laboratory-prepared sample containers directly from disposable Teflon bailers. Sample bottles for the VOC analysis were filled first, followed by the remaining Appendix IX list (organics), TPH DRO and GRO, and finally the Appendix IX inorganic analyses. Groundwater samples were kept in coolers on ice and under strict chain-of-custody until delivered to the laboratory. Chain-of-custody forms for environmental media samples are provided as Appendix B.

4.3 Standing Water Sampling Procedures

A standing water sampling program was conducted at SWMU 54 during this investigation to assess whether the standing water in two open excavation areas south of Building contained any contamination. Samples of standing water were collected from the first two inches of the standing water in each open excavation area. Samples analyzed for VOC were obtained first, by dipping a clean unpreserved laboratory container into the standing water and then transferring the contents into the VOC container without allowing the preservative to escape. Sample containers for the remaining analysis were then collected utilizing the same process as for the VOC containers. Standing water samples were kept in coolers on ice and under strict chain-of-custody until delivered to the laboratory. Chain-of-custody forms for environmental media samples are provided as Appendix B.

4.4 Wipe Sampling Procedures

A wipe-sampling program was conducted at SWMU 53 during this investigation to assess the extent of contamination inside Building 64 if any were to be present. Samples were collected utilizing a sampling kit provided by the laboratory. The samples were collected in a measured grid pattern designated in the field and analyzed for pesticides/PCBs.

Four wipe samples were collected from the floor of Building 64 (SWMU 53) on December 17, 2000 for Appendix IX analysis of pesticides. Each sample was collected using the following procedures:

- The four locations were laid out in a staggered grid, but were biased to heavy stains and drainage areas. No marking was done, and walking was minimized on the floor until after samples were collected.

- A 10-centimeters (cm) by 10-cm cardboard template was laid on the desired location.

- Each sample consisted of two wipes in two separate containers, one primary sample and one backup. The sample containers were labeled prior to sample collection.

- A hexane-soaked wipe was removed from the sample container. The wipe was rubbed on the concrete floor surface in perpendicular up and down and left to right motions. The process was repeated for the second wipe (the backup sample).

- Each wipe was placed back into the sample container, the label was then taped, and the containers were placed on ice until shipment to the laboratory. Chain-of-custody forms for environmental media samples are provided as Appendix B.

Upon completion of sample collection the sample locations were marked and measured from the building walls.

4.5 Quality Assurance/Quality Control Sampling Procedures

Extensive field Quality Assurance/Quality Control (QA/QC) samples were collected during the sampling program (Table 4-4). These samples were obtained to:

(1) ensure that decontamination procedures were properly implemented (i.e., equipment rinsate blanks);

(2) evaluate field methodology (i.e., duplicate samples);

(3) establish field background conditions (i.e., field blanks); and,

(4) Evaluate whether cross-contamination occurred during sampling and/or shipping (i.e., trip blanks).

Several types of field QA/QC samples were collected and analyzed including duplicate samples, equipment rinsate samples, field blanks, matrix spike/matrix spike duplicate (MS/MSD), and trip blanks. These QA/QC samples are defined below:

- Duplicate Sample (D): Two samples collected simultaneously into separate containers from the same source under identical conditions. One duplicate sample was collected for every 10 environmental samples collected for each media type.

- Equipment Rinsate Sample (ER): Sample obtained by running laboratory supplied deionized water over/through sample collection equipment after it was decontaminated. These samples were used to determine if decontamination procedures were adequate.

- Field Blank (FB): Sample obtained from each water source utilized during the field program. The water sources used during the field program included: laboratory supplied deionized water utilized to collect rinsate blanks; store bought distilled water utilized for decontamination, and potable water utilized for decontamination.

- Matrix Spike/Matrix Spike Duplicate (MS/MSD): MS/MSDs are not field samples but are laboratory derived, and are collected to evaluate the matrix effect of the sample upon the analytical methodology. An MS and MSD must be performed for each group of samples of a similar matrix. MS/MSD samples were collected at a frequency of five percent.

- Trip Blank (TB): Trip blanks were prepared at the laboratory and shipped with the sample containers. Trip blanks were packaged for shipment with the other VOC samples and sent for analysis. At no time after their preparation were the trip blank sample containers opened before they reached the laboratory. At least one trip blank per shipping cooler containing samples requiring VOC analysis was sent to the laboratory for VOC analysis.

4.6 Decontamination Procedures

Decontamination procedures performed in the field were conducted in accordance with EPA Region II guidelines. For routine sample collection equipment, the following steps were implemented:

- Clean with potable water and low-phosphate detergent
- Tap water rinse
- 10 percent nitric acid solution rinse
- Tap water rinse
- Methanol followed by a hexane or an acetone rinse
- Analyte-free deionized water rinse
- Air dry
- Wrap in aluminum foil, shiny side out, for storage or transport

This decontamination procedure was performed on stainless steel sampling spoons and the split-spoon samplers used in drilling operations in accordance with Baker's standard operating procedure (SOP) F502. Decontamination of heavy equipment (i.e., hollow-stem augers and drill rods) was performed by rinsing with potable water to remove soil followed by steam cleaning, in accordance with SOP F501 as contained in the EPA approved work plan.

4.7 Surveying

Surveying was conducted during this investigation for surface soil, soil boring and temporary well locations. All sample locations were flagged in the field and were surveyed horizontally and vertically using established controls.

4.8 Sampling Activities SWMU 53

A sampling program was conducted at SWMU 53 and included the collection of surface soil, subsurface soil and wipe samples. Sampling locations are depicted on Figure 4-1 and the analytical program is shown in Table 4-5. Appendices C and D present site photographs and field notes from the SWMU 53 field investigation, respectively.

4.8.1 Surface Soil Investigation

The surface soil investigation at SWMU 53 involved the collection of twelve soil samples (53SS01 through 53SS06 and 53SB01-00 through 53SB06-00) and three duplicate samples. Three locations (53SS03, 53SS04 and 53SB03) were sampled on the eastern side of Building 64, because of a strong pesticide odor that was observed during a recent site visit performed by Baker. Two locations (53SS02 and 53SB02) were sampled on the northern side of the building, and two (53SB04 and 53SS05) on the southern side. These samples will help characterize the extent of contamination adjacent to the structure, if any exists. Four locations (53SS01, 53SB05, 53SB06 and 53SS06) were sampled on the western side of the building to address the cut in the floor curbing beneath the door. This cut in the floor curbing may have served as a release point to the exterior of the building from any liquids left on the floor. One location (53SB01) was sampled downgradient of the northwest corner of the building, to characterize if lateral migration of contamination has occurred down gradient from this building. All samples were analyzed for pesticides/polychlorinated biphenyls (PCBs) and Appendix IX metals. A summary of the samples taken and the analysis performed is presented in Table 4-5.

4.8.2 Subsurface Soil Investigation

A total of seven subsurface samples were collected at SWMU 53 as presented in Table 4-5. Samples 53SB01-03 and 53SB01-05 were collected off of the northwest corner of the building to characterize if lateral migration of contamination has occurred down gradient from this building. Soil boring sample 53SB03-01 was sampled on the eastern side of Building 64, where a strong pesticide odor was observed during a recent site visit performed by Baker. Soil boring sample 53SB02-02 was sampled on the northern side of Building 64, while 53SB04-02 was sampled on the southern side of this building. Samples 53SB05-02 and 53SB06-03 were collected on the western side of the building. All samples were analyzed for pesticides/PCBs and Appendix IX metals. Samples were collected at the depths mentioned on Table 4-5, to characterize the subsurface material immediately above the competent bedrock. Two subsurface soil samples were collected from soil boring location 53SB01 due to the greater depth to competent bedrock at this location (approximately 10 feet). An intermediate sample (53SB01-03) was therefore collected between the top of competent bedrock and the surface soil sample. The other five soil borings (53SB02 through 53SB06) contained only one subsurface soil sample because of their shallow depths to top of competent bedrock at their respective locations.

4.8.3 Wipe Sampling Investigation

Four wipe samples (53WP01 through 53WP04) were collected inside Building 64 from areas of visible staining on the floors. Wipe sample 53WP01 was collected 2.4 feet south and 2.6 feet east from the northwest corner of the building. Wipe sample location 53WP02 was collected 7.1 feet east and 2.2 feet north from the southwest corner of the building. Wipe sample location 53WP03 was collected 2.6 feet south and 5.8 feet west from the northeast corner of the building. Wipe sample location 53WP04 was collected 2.4 feet west and 2.9 feet north from the southeast corner of Building 64 as presented on Figure 4-1. These samples were collected because of possible past leakage on the storage shelves and floor. Wipe samples were analyzed for pesticides/PCBs as indicated in Table 4-5.

4.9 Sampling Activities SWMU 54

A sampling program was conducted at SMWU 54 that included the collection of surface soil, subsurface soil, groundwater, and standing water samples. Sampling locations are presented on Figure 4-2 and the analytical program is shown in Table 4-6. Appendices C and D present site photographs and field notes from the SWMU 54 field investigation, respectively.

4.9.1 Surface Soil Investigation

The surface soil investigation at SWMU 54 involved the collection of 16 surface soil samples (54SS01 through 54SS15, and 54SB01-00) and two duplicates which were analyzed for the full Appendix list, as well as TPH DRO and GRO. Four samples were collected approximately 45 feet from each corner (54SS07, 54SS08, 54SS14, and 54SS15), and one sample was collected from the eastern side of Building 1914 (54SS11). Two sample locations (54SS02 and 54SS03) were along the northern side of the building, and two sample locations (54SS04 and 54SS05) were along the southern side of the building. Two sample locations (54SS01 and 54SS06) were collected approximately 30 feet from the western side of the building. The above mentioned samples will help to determine if lateral migration of contaminants has occurred if present. Surface soil locations around the above ground storage tank containment pad (54SS12 and 54SS13), as well as around the open storage shed (54SS09 and 54SS10) were sampled to help characterize the extent of contamination, if any were to be present adjacent to the structures. Surface soil sample 54SB01-00 was collected from temporary well location 54TW01, located just west of the oil/water separator. A summary of the samples collected for SWMU 54 and analysis conducted is presented in Table 4-6, and sampling locations are shown on Figure 4-2.

4.9.2 Subsurface Soil Investigation

A total of four subsurface soil samples (54SB01-05, 54SB01-08, 54SB02-02, and 54SB02-06) were collected from the soil borings associated with two temporary monitor wells at SWMU 54. One boring was advanced west of the oil/water separator (temporary monitor well 54TW01), where subsurface soil samples 54SB01-05 and 54SB01-08 were collected. Another boring was advanced west of the southern bay of Building 1914 (temporary monitor well 54TW02), where 54SB02-02 and 54SB02-06 were collected. At each soil boring location continuous split spoon sampling was implemented at two-foot intervals and samples were collected from areas of suspected contamination and/or from the interval immediately above the water table. All samples were analyzed for the full Appendix IX list, as well as TPH Diesel Range Organics (DRO) and Gasoline Range Organics (GRO) as indicated in Table 4-6. Sample locations are presented on Figure 4-2. Samples were collected at the depths mentioned on Tables 4-6, to characterize the soil between the surface and the groundwater. Samples (54SB01-08 and 54SB02-06) were collected from the interval immediately above the water table, while samples (54SB01-05 and 54SB02-02) were collected from a mid-point depth in the soil boring between the surface and the water table, and at an interval of suspected contamination, respectively.

4.9.3 Groundwater Investigation

A total of nine groundwater samples (510MW1 through 510MW5, 510DW1, 510DW2, 54TW01, and 54TW02) were collected along with one duplicate sample at SWMU 54. All seven existing monitor wells from adjacent Site 510 were sampled during this investigation. According to the Site Characterization Report (BB&L, 1995), analytical results indicated that in two of the seven monitor wells (510MW1 and 510DW1), Benzene was detected in levels exceeding the Federal Maximum Contaminant Levels (MCLs). The additional samples collected from these two wells will help to characterize whether high levels of Benzene continue to be present at this site. Samples were collected from the other five monitor wells to evaluate if constituents detected in 1995 have migrated laterally throughout the site, or if natural attenuation of the groundwater is occurring decreasing concentrations of BTEX found over time. Groundwater samples (54TW01 and 54TW02) were collected to determine if any contamination has migrated down-gradient from SWMU 54. All groundwater samples were analyzed for the full Appendix IX list, as well as TPH DRO and GRO as indicated in Table 4-6. The groundwater samples (510MW1 and 510MW2) were also analyzed for groundwater quality criteria, as presented in Table 4-7.

4.9.4 Standing Water Investigation

A total of two standing water samples (54SW01 and 54SW02) and one duplicate were collected from the two open excavation areas south of Building 1914, as presented on Figure 4-2. Although the water looked to be algae stained, the standing water samples were collected to verify if the water contains any contaminants. The standing water samples were submitted to a mainland laboratory for analysis of the full Appendix IX list, as well as TPH DRO and GRO as presented in Table 4-6. Sample locations are presented on Figure 4-2.

SECTION 4.0 TABLES

TABLE 4-1

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT
REQUIRED QUANTITATION LIMITS (CRQL)

Volatiles	Quantitation Limits*		Method Number
	Water (mg/L)	Low Soil (mg/kg)	
Acetone	50	50	8260
Acetonitrile	200	200	8260
Acrolein	100	100	8260
Acrylonitrile	100	100	8260
Benzene	5.0	5.0	8260
Bromodichloromethane	5.0	5.0	8260
Bromoform	5.0	5.0	8260
Bromomethane	10	10	8260
Carbon Disulfide	5.0	5.0	8260
Carbon Tetrachloride	5.0	5.0	8260
Chlorobenzene	5.0	5.0	8260
Chloroethane	10	10	8260
Chloroform	5.0	5.0	8260
Chloromethane	10	10	8260
Chloroprene	5.0	3.0	8260
3-Chloro-1-propene	5.0	5.0	8260
1,2-Dibromo-3-chloropropane	5.0	10	8260
Dibromochloromethane	5.0	5.0	8260
1,2-Dibromoethane	5.0	5.0	8260
Dibromomethane	5.0	5.0	8260
trans-1,4-Dichloro-2-butene	10	10	8260
Dichlorodifluoromethane	10	5.0	8260
Dibromomethane	5.0	5.0	8260
1,1-Dichloroethane	5.0	5.0	8260
1,2-Dichloroethane	5.0	5.0	8260
trans-1,2-dichloroethene	5.0	5.0	8260
1,1-Dichloroethene	5.0	5.0	8260
Methylene Chloride	5.0	5.0	8260
1,2-Dichloropropane	5.0	5.0	8260
cis-1,3-Dichloropropene	5.0	5.0	8260
trans-1,3-Dichloropropene	5.0	5.0	8260
Ethyl benzene	5.0	5.0	8260
Ethyl methacrylate	5.0	5.0	8260
2-Hexanone	25	25	8260
Iodomethane	5.0	5.0	8260
Isobutanol	200	200	8260
Methacrylonitrile	100	100	8260
2-Butanone	25	25	8260
Methyl methacrylate	5.0	5.0	8260
4-Methyl-2-pentanone	25	25	8260

TABLE 4-1 (continued)

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT
REQUIRED QUANTITATION LIMITS (CRQL)

Volatiles	Quantitation Limits*		Method Number
	Water (mg/L)	Low Soil (mg/kg)	
Pentachloroethane	25	25	8260
Propionitrile	100	100	8260
Stryene	5.0	5.0	8260
1,1,1,2-Tetrachloroethane	5.0	5.0	8260
1,1,2,2-Tetrachloroethane	5.0	5.0	8260
Tetrachloroethene	5.0	5.0	8260
Toluene	5.0	5.0	8260
1,1,1-Trichloroethane	5.0	5.0	8260
1,1,2-Trichloroethane	5.0	5.0	8260
Trichloroethene	5.0	5.0	8260
Trichlorofluoromethane	5.0	5.0	8260
1,2,3-Trichloropropane	5.0	5.0	8260
Vinyl Acetate	10	10	8260
Vinyl Chloride	10	10	8260
Xylene	10	10	8260

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

TABLE 4-1 (continued)

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT
REQUIRED QUANTITATION LIMITS (CRQL)

Semivolatiles	Quantitation Limits*		Method Number
	Water (mg/L)	Low Soil (mg/kg)	
Acenaphthene	10	330	8270
Acenaphthylene	10	330	8270
Acetophenone	10	330	8270
2-Acetylaminofluorene	10	330	8270
4-Aminobiphenyl	20	330	8270
Aniline	20	330	8270
Anthracene	10	330	8270
Aramite	10	330	8270
Benzo(a)anthracene	10	330	8270
Benzo(b)fluoranthene	10	330	8270
Benzo(k)fluoranthene	10	330	8270
Benzo(g,h,i)perylene	10	330	8270
Benzo(a)pyrene	10	330	8270
Benzyl alcohol	10	330	8270
Bis(2-chloroethoxyl)methane	10	330	8270
Bis(2-chloroethyl)ether	10	330	8270
Bis(2-ethylhexyl)phthalate	10	330	8270
4-Bromophenyl phenyl ether	10	330	8270
Butylbenzylphthalate	10	330	8270
4-Chloroaniline	20	660	8270
4-Chloro-3-methylphenol	10	330	8270
2-Chloronaphthalene	10	330	8270
2-Chlorophenol	10	330	8270
4-Chlorophenyl phenyl ether	10	330	8270
Chrysene	10	330	8270
3&4 Methylphenol	10	330	8270
2-Methylphenol	10	330	8270
Diallate	10	330	8270
Dibenzofuran	10	330	8270
Di-n-butyl phthalate	10	330	8270
Dibenzo(a,h)anthracene	10	330	8270
o-Dichlorobenzene	10	330	8270
m-Dichlorobenzene	10	330	8270
p-Dichlorobenzene	10	330	8270
3,3'-Dichlorobenzidine	20	660	8270
2,4-Dichlorophenol	10	330	8270
2,6-Dichlorophenol	10	330	8270
Diethylphthalate	10	330	8270
p-(Dimethylamino)azobenzene	10	330	8270
7,12-Dimethyl benz(a)anthracene	10	330	8270

TABLE 4-1 (continued)

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT
REQUIRED QUANTITATION LIMITS (CRQL)

Semivolatiles	Quantitation Limits*		Method Number
	Water (mg/L)	Low Soil (mg/kg)	
3,3-Dimethyl benzidine	20	1,700	8270
2,4-Dimethylphenol	10	330	8270
alpha, alpha-Dimethylphenethylamine	2,000	67,000	8270
Dimethyl phthalate	10	330	8270
m-Dinitrobenzene	10	330	8270
4,6-Dinitro-2-methylphenol	50	1,700	8270
2,4-Dinitrophenol	50	1,700	8270
2,4-Dinitrotoluene	10	330	8270
2,6-Dinitrotoluene	10	330	8270
Di-n-octylphthalate	10	330	8270
1,4-Dioxane	10	330	8270
Dinoseb	10	330	8270
Ethylmethanesulfonate	10	330	8270
Fluoranthene	10	330	8270
Fluorene	10	330	8270
Hexachlorobenzene	10	330	8270
Hexachlorobutadiene	10	330	8270
Hexachlorocyclopentadiene	10	330	8270
Hexachloroethane	10	330	8270
Hexachlorophene	5,000	170,000	8270
Hexachloropropene	10	330	8270
Indeno(1,2,3-cd)pyrene	10	330	8270
Isophorone	10	330	8270
Isosafrole	10	330	8270
Methapyrilene	2,000	67,000	8270
3-Methylcholanthrene	10	330	8270
Methyl methanesulfonate	10	330	8270
2-Methylnaphthalene	10	330	8270
Naphthalene	10	330	8270
1,4-Naphthoquinone	10	330	8270
1-Naphthylamine	10	330	8270
2-Naphthylamine	10	330	8270
2-Nitroaniline	50	1,700	8270
3-Nitroaniline	50	1,700	8270
4-Nitroaniline	50	1,700	8270
Nitrobenzene	10	330	8270
2-Nitrophenol	10	330	8270
4-Nitrophenol	50	1,700	8270
4-Nitroquinoline-1-oxide	20	3,300	8270
n-Nitrosodi-n-butylamine	10	330	8270

TABLE 4-1 (continued)

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT
REQUIRED QUANTITATION LIMITS (CRQL)

Semivolatiles	Quantitation Limits*		Method Number
	Water (mg/L)	Low Soil (mg/kg)	
n-Nitrosodiethylamine	10	330	8270
n-Nitrosodimethylamine	10	330	8270
n-Nitrosodiphenylamine	NA	330	8270
n-Nitrosodi-n-propylamine	10	330	8270
n-Nitrosomethylethylamine	10	330	8270
n-Nitrosomorpholine	10	330	8270
n-Nitrosopiperidine	10	330	8270
n-Nitrosopyrrolidine	10	330	8270
5-Nitro-o-toluidine	10	330	8270
bis-(2-chloroisopropyl)ether	10	330	8270
Pentachlorobenzene	10	330	8270
Pentachloronitrobenzene	10	330	8270
Pentachlorophenol	50	1,700	8270
Phenacetin	10	330	8270
Phenanthrene	10	330	8270
Phenol	10	330	8270
1,4-Phenylenediamine	2,000	1,700	8270
2-Picolin	10	330	8270
Pronamide	10	330	8270
Pyrene	10	330	8270
Pyridine	50	330	8270
Safrole	10	330	8270
1,2,4,5-Tetrachlorobenzene	10	330	8270
2,3,4,6-Tetrachlorophenol	10	330	8270
o-Toluidine	10	330	8270
1,2,4-Trichlorobenzene	10	330	8270
2,4,5-Trichlorophenol	10	330	8270
2,4,6-Trichlorophenol	10	330	8270
1,3,5-Trinitrobenzene	10	330	8270

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

NA = Not Available

TABLE 4-1 (continued)

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT
REQUIRED QUANTITATION LIMITS (CRQL)

Pesticides/PCBs	Quantitation Limits*		Method Number
	Water (mg/L)	Low Soil (mg/kg)	
Aldrin	0.05	1.7	8081
Alpha-BHC	0.05	1.7	8081
beta-BHC	0.05	1.7	8081
delta-BHC	0.05	1.7	8081
gamma-BHC	0.05	1.7	8081
Chlordane	0.5	17	8081
Chlorobenzilate	0.5	17	8081
4,4'-DDT	0.1	3.3	8081
4,4'-DDE	0.1	3.3	8081
4,4'-DDD	0.1	3.3	8081
Dieldrin	0.1	3.3	8081
Endosulfan I	0.05	1.7	8081
Endosulfan II	0.1	3.3	8081
Endosulfan sulfate	0.1	3.3	8081
Endrin	0.1	3.3	8081
Isodrin	0.05	3.3	8081
Kepone	1.0	170	8081
Toxaphene	5.0	170	8081
Endrin Aldehyde	0.1	3.3	8081
Heptachlor	0.05	1.7	8081
Heptachlor epoxide	0.05	1.7	8081
Methyoxychlor	0.5	17	8081
Aroclor-1016	1.0	33	8082
Aroclor-1221	2.0	67	8082
Aroclor-1232	1.0	33	8082
Aroclor-1242	1.0	33	8082
Aroclor-1248	1.0	33	8082
Aroclor-1254	1.0	33	8082
Aroclor-1260	1.0	33	8082

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

TABLE 4-1 (continued)

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT
REQUIRED QUANTITATION LIMITS (CRQL)

OP-Pesticides	Quantitation Limits*		Method Number
	Water (mg/L)	Low Soil (mg/kg)	
Dimethoate	10	330	8270
Disulfoton	NA	330	8270
Famphur	10	330	8270
Methyl parathion	10	330	8270
o,o,o-Triethylphosphorothioate	10	330	8270
Parathion	10	330	8270
Phorate	10	330	8270
Sulfotepp	10	330	8270
Thionazin	10	330	8270

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

NA = Not Available

TABLE 4-1 (continued)

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT
REQUIRED QUANTITATION LIMITS (CRQL)

Dioxins/Furans (SW-846 Method 8280)	Quantitation Limits*		Method Number
	Water (mg/L)	Low Soil (mg/kg)	
2,3,7,8-TCDD	0.005	0.50	8280
2,3,7,8-PCDF	0.005	0.50	8280
2,3,7,8-PCDD	0.005	0.50	8280
2,3,7,8-HCDF	0.005	0.50	8280
2,3,7,8-HCDD	0.005	0.50	8280
2,3,7,8-TCDF	0.005	0.50	8280

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

TABLE 4-1 (continued)

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT
REQUIRED QUANTITATION LIMITS (CRQL)

Chlorinated Herbicides	Quantitation Limits*		Method Number
	Water (mg/L)	Low Soil (mg/kg)	
2,4-D	0.50	8.3	8151
2,4,5-T	0.50	8.3	8151
2,4,5-TP	0.50	8.3	8151

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

TABLE 4-1 (continued)

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT
REQUIRED QUANTITATION LIMITS (CRQL)

Inorganics	Method Number	Quantitation Limits* Water (mg/L)	Quantitation Limits* Low Soil (mg/kg)	Method Description
Antimony	6010	20	2.0	Inductively Coupled Plasma
Arsenic	6010	10	1.0	Inductively Coupled Plasma
Barium	6010	10	1.0	Inductively Coupled Plasma
Beryllium	6010	4.0	0.4	Inductively Coupled Plasma
Cadmium	6010	5.0	0.5	Inductively Coupled Plasma
Chromium	6010	10	1.0	Inductively Coupled Plasma
Cobalt	6010	10	1.0	Inductively Coupled Plasma
Copper	6010	20	2.0	Inductively Coupled Plasma
Lead	6010	5.0	0.5	Inductively Coupled Plasma
Mercury	7470/7471	0.2	0.02	Cold Vapor AA
Nickel	6010	40	4.0	Inductively Coupled Plasma
Selenium	6010	10	1.0	Inductively Coupled Plasma
Silver	6010	10	1.0	Inductively Coupled Plasma
Thallium	6010	10	1.0	Inductively Coupled Plasma
Tin	6010	10	5.0	Inductively Coupled Plasma
Vanadium	6010	10	1.0	Inductively Coupled Plasma
Cyanide	9012	0.010	1.0	Colorimetric
Sulfide	9030	1.0	25	Titrimetric, Iodine
Zinc	6010	20	2.0	Inductively Coupled Plasma

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

TABLE 4-2

SUMMARY OF WELL CONSTRUCTION DETAILS
SWMU 54 - BUILDING 1914 (NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Well No.	Date Installed	Installation Contractor	Top of Casing Elevation (feet, msl)	Ground Surface Elevation (feet above msl)	Boring Depth (feet, bgs)	Well Depth (feet, bgs)	Screen Interval Depth (feet, bgs)	Sand Pack Interval (feet, bgs)	Bentonite Interval (feet, bgs)	Stick-Up (feet, ags)
510MW1	2/21/95	BB&L[1]	22.59[3]	NA	13.5	13	3-13	2-13	1.5-2.0	[5]
510MW2	2/21/95	BB&L[1]	22.94[3]	NA	20.5	20	5-20	4-20	3.0-4.0	*3
510MW3	2/21/95	BB&L[1]	22.92[3]	NA	15.5	15	5-15	4-15	3.0-4.0	*3
510MW4	2/22/95	BB&L[1]	21.56[3]	NA	15.5	15	5-15	4-15	3.5-4.0	[5]
510MW5	3/21/95	BB&L[1]	25.30[3]	NA	20.0	19.5	9.5-19.5	7.5-20	6.3-7.5	[5]
510DW1	3/23/95	BB&L[1]	22.80[3]	NA	25.5	25	20-25	18-25	16.5-18.0	[5]
510DW2	4/17/95	BB&L[1]	22.76[3]	NA	45.5	45	40-45	36-45	35.5-36.0	[5]
54TW01	12/15/00	Baker[2]	118.13[4]	NA	20.0	20.0	10-20	---	---	NM
54TW02	12/15/00	Baker[2]	118.22[4]	NA	18.0	18.0	8-18	---	---	NM

Notes:

ags = above ground surface
bgs = below ground surface
msl = mean sea level
NA = Not Available
NM = Not Measured
* = Approximately
--- = Not Applicable

[1] BB&L = Blasland Bouck and Lee.

[2] Baker = Baker Environmental, Inc.

[3] Elevation in reference to the Daguao Station elevation of 17.51 ft msl.

[4] Elevation in reference to the Mean Low Water Datum = 100 Ft. as established by the US Navy Survey Section as of November 1941.

[5] Flushmount well.

TABLE 4-3

SUMMARY OF GROUNDWATER FIELD PARAMETERS - DECEMBER 2000
SWMU 54 - BUILDING 1914 (NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Well No.	Well Volumes	Temperature (^{0}C)	pH (S.U.)	Specific Conductance (umhos/cm)	Dissolved Oxygen (mg/L)	Turbidity (N.T.U.)
510MW4	0.0	30.1	6.96	2022	2.40	NA
12/15/00	1.0	29.8	6.95	2003	1.96	NA
	2.0	29.7	6.96	2018	1.48	NA
	3.0	29.6	6.91	2005	1.64	NA
	4.0	29.7	6.95	2016	1.84	NA
510MW1	0.0	28.8	6.72	889	NA	95.1
12/15/00	1.0	29.0	6.86	883	NA	68.5
	2.0	29.1	6.90	889	NA	72.8
	3.0	28.9	6.91	882	2.40	47.2
	4.0	29.1	6.84	889	1.91	84.0
	5.0	29.0	6.87	862	2.81	NA
	6.0	29.0	6.84	885	2.32	NA
510DW1	0.0	27.1	7.26	896	0.87	NA
12/18/00	1.0	27.5	7.20	821	1.16	NA
	2.0	27.9	7.23	818	1.89	NA
	3.0	27.0	7.17	793	1.84	NA
	4.0	27.9	7.14	801	1.74	NA
	5.0	27.6	7.20	798	1.84	NA
510DW2	0.0	28.8	6.96	1028	1.75	NA
12/18/00	1.0	29.1	7.01	996	2.36	NA
	2.0	28.9	6.94	975	1.55	NA
	3.0	29.1	6.86	992	1.73	NA
	4.0	29.2	6.91	979	2.30	NA
	5.0	29.2	6.84	987	1.81	NA
510MW3	0.0	28.3	6.93	1207	1.53	NA
12/18/00	1.0	28.3	6.88	1217	1.35	NA
	2.0	28.4	6.84	1220	1.77	NA
	3.0	28.4	6.82	1174	1.62	NA
	4.0	28.2	6.80	1134	1.75	NA
	5.0	28.3	6.76	1142	1.64	NA
510MW2	0.0	27.1	7.00	1526	1.35	NA
12/19/00	1.0	27.3	7.02	1233	1.46	NA
	2.0	27.4	7.01	1519	1.29	NA
	3.0	27.4	7.00	1532	1.41	NA
	4.0	27.4	7.03	1538	1.61	NA

TABLE 4-3 (continued)

SUMMARY OF GROUNDWATER FIELD PARAMETERS - DECEMBER 2000
SWMU 54 - BUILDING 1914 (NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Well No.	Well Volumes	Temperature (^{0}C)	pH (S.U.)	Specific Conductance (umhos/cm)	Dissolved Oxygen (mg/L)	Turbidity (N.T.U.)
54TW02 12/19/00	0.0	30.1	6.41	1069	1.60	NA
	0.5	30.3	6.28	1072	1.56	NA
	1.0	30.1	6.26	1067	1.79	NA
	2.0	30.3	6.26	1068	1.53	NA
	2.5	30.3	6.27	1070	1.53	NA
	3.0	30.2	6.26	1071	1.68	NA
54TW01 12/19/00	0.0	29.1	6.48	1477	2.00	NA
	0.5	29.1	6.62	1424	4.04	NA
	1.0	29.3	6.58	1451	3.83	NA
	Well Bailed Dry					
510MW5 12/21/00	0.0	27.5	7.12	1797	1.50	17.61
	1.0	28.1	7.08	1800	1.45	28.2
	1.5	28.1	7.09	1769	1.60	29.8
	2.0	28.3	7.09	1808	2.18	36.5
	2.3	28.4	7.10	1810	1.45	39.5
	3.0	28.4	7.09	1820	1.62	38.5

Notes:
(^{0}C) = Degrees Centigrade.
S.U. = Standard Unit.
umhos/cm = micro ohms per centimeter.
mg/L = milligrams per liter.
N.T.U. = Nephlometric Turbidity Units.
NA = Not Available.

TABLE 4-4

SUMMARY OF SAMPLING AND ANALYTICAL PROGRAM
QA/QC SAMPLES - SWMUs 53 AND 54
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

			Analysis Requested Aqueous Samples				
Sample ID	Date Sampled	Time	APP IX List	TPH (Diesel Range Organics)	TPH (Gasoline Range Organics)	Pesticides/PCBs	Appendix IX VOCs
SWMU 53 - Equipment Rinsates							
53ER01	12/14/00	1235				X	
53ER02	12/14/00	1255				X	
SWMU 54 - Trip Blanks/Equipment Rinsates							
54TB01	12/15/00	1345			X		X
TB04	12/18/00	1615			X		X
TB06	(1)	(1)			X		X
TB07	12/19/00	1535			X		X
TB09A	12/20/00	1730			X		X
TB10	12/21/00	1000					X
54ER01	12/19/00	0940	X	X	X		
54ER02	12/21/00	0845	X	X	X		
54ER03	12/19/00	1730	X	X	X		
SWMUs 53 and 54 - Field Blanks							
2000FB01	12/20/00	1830	X	X	X		
2000FB02	12/21/00	0830	X	X	X		
2000FB03	12/20/00	1630	X	X	X		

Notes:
(1) - Not Available.

TABLE 4-5

SUMMARY OF SAMPLING AND ANALYTICAL PROGRAM
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

				Analysis Requested Solid Samples		
Sample ID	Sample Depth (ft bgs)	Date Collected	Time	APP IX Metals	Pesticides/PCBs	Comments
Surface Soil Sampling						
53SS01	0.0-1.0	12/13/00	1658	X	X	
53SS02	0.0-1.0	12/13/00	1653	X	X	
53SS03	0.0-1.0	12/13/00	1655	X	X	
53SS04	0.0-1.0	12/13/00	1700	X	X	
53SS05	0.0-1.0	12/13/00	1705	X	X	
53SS06	0.0-1.0	12/13/00	1710	X	X	
53SS06D	0.0-1.0	12/13/00	1710	X	X	Duplicate
53SS06MS/MSD	0.0-1.0	12/13/00	1710	X	X	Matrix Spike/ Matrix Spike Duplicate
53SB01-00	0.0-1.0	12/14/00	1033	X	X	
53SB02-00	0.0-1.0	12/14/00	1000	X	X	
53SB02-00D	0.0-1.0	12/14/00	1000	X	X	Duplicate
53SB02-00 MS/MSD	0.0-1.0	12/14/00	1000	X	X	Matrix Spike/ Matrix Spike Duplicate
53SB03-00	0.0-1.0	12/14/00	0915	X	X	
53SB04-00	0.0-1.0	12/14/00	0800	X	X	
53SS04-00D	0.0-1.0	12/14/00	0800	X	X	Duplicate
53SB05-00	0.0-1.0	12/13/00	1415	X	X	
53SB06-00	0.0-1.0	12/13/00	1525	X	X	
Subsurface Soil Investigation						
53SB01-03	4.0-6.0	12/14/00	1045	X	X	
53SB01-05	8.0-10.0	12/14/00	1110	X	X	
53SB02-02	2.0-4.0	12/14/00	1014	X	X	
53SB03-01	0.0-2.0	12/14/00	0923	X	X	
53SB04-02	4.0-5.5	12/14/00	0833	X	X	
53SB05-02	2.0-4.0	12/13/00	1445	X	X	
53SB06-03	4.0-6.0	12/13/00	1544	X	X	
Wipe Sample Investigation						
53WP01	NA	12/17/00	1700		X	
53WP02	NA	12/17/00	1710		X	
53WP03	NA	12/17/00	1715		X	
53WP04	NA	12/17/00	1720		X	

Notes:
NA = Not Applicable
ft bgs = feet below ground surface

TABLE 4-6

SUMMARY OF SAMPLING AND ANALYTICAL PROGRAM
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

				Analysis Requested Solid Samples			
Sample ID	Sample Depth (ft bgs)	Date Collected	Time	APP IX List	TPH (Diesel Range Organics)	TPH (Gasoline Range Organics)	Comments
Surface Soil Investigation							
54SS01	0.0-1.0	12/13/00	1030	X	X	X	
54SS02	0.0-1.0	12/13/00	1235	X	X	X	
54SS03	0.0-1.0	12/13/00	1723	X	X	X	
54SS04	0.0-1.0	12/14/00	1641	X	X	X	
54SS04D	0.0-1.0	12/14/00	1641	X	X	X	Duplicate
54SS05	0.0-1.0	12/14/00	1025	X	X	X	
54SS06	0.0-1.0	12/13/00	1022	X	X	X	
54SS07	0.0-1.0	12/13/00	0956	X	X	X	
54SS08	0.0-1.0	12/14/00	1706	X	X	X	
54SS09	0.0-1.0	12/14/00	1710	X	X	X	
54SS10	0.0-1.0	12/20/00	1430	X	X	X	
54SS11	0.0-1.0	12/20/00	1430	X	X	X	
54SS12	0.0-1.0	12/13/00	1245	X	X	X	
54SS13	0.0-1.0	12/14/00	0852	X	X	X	
54SS13D	0.0-1.0	12/14/00	0852	X	X	X	Duplicate
54SS13MS/MSD	0.0-1.0	12/14/00	0852	X	X	X	Matrix Spike/Matrix Spike Duplicate
54SS14	0.0-1.0	12/13/00	1105	X	X	X	
54SS15	0.0-1.0	12/13/00	1100	X	X	X	
54SB01-00	0.0-1.0	12/15/00	1300	X	X	X	
Subsurface Soil Investigation							
54SB01-05	8.0-10.0	12/15/00	1600	X	X	X	
54SB01-08	14.0-16.0	12/15/00	1550	X	X	X	
54SB02-02	2.0-4.0	12/15/00	1040	X	X	X	
54SB02-06	10.0-12.0	12/15/00	1040	X	X	X	

Notes:

NA= Not Applicable

ft bgs = feet below ground surface

TABLE 4-6 (continued)

SUMMARY OF SAMPLING AND ANALYTICAL PROGRAM
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

				Analysis Requested Solid Samples				
Sample ID	Sample Depth (bgs)	Date Collected	Time	APP IX List	TPH (Diesel Range Organics)	TPH (Gasoline Range Organics)	Groundwater Quality	Comments
Groundwater Investigation								
510-MW1	NA	12/15/00	1020	X	X	X	X	NA
510-MW2	NA	12/19/00	1005	X	X	X	X	NA
510-MW2D	NA	12/19/00	0805	X	X	X		Duplicate
510-MW2MS	NA	12/19/00	0805	X	X	X		Matrix Spike
510-MW2MSD	NA	12/19/00	0805	X	X	X		Matrix Spike/Matrix Spike Duplicate
510-MW3	NA	12/18/00	1040	X	X	X		NA
510-MW4	NA	12/18/00	1010	X	X	X		NA
510-MW5	NA	12/21/00	0730	X	X	X		NA
510-DW1	NA	12/18/00	0840	X	X	X		NA
510-DW2	NA	12/18/00	1005	X	X	X		NA
54TW01	NA	12/20/00	0700	X	X	X		NA
54TW02	NA	12/19/00	0940	X	X	X		NA
Standing Water Investigation								
54SW01	NA	12/16/00	1650	X	X	X		NA
54SW01D	NA	12/16/00	1650	X	X	X		Duplicate
54SW02	NA	12/16/00	1615	X	X	X		NA

Notes:

NA = Not Applicable.

ft bgs = feet below ground surface.

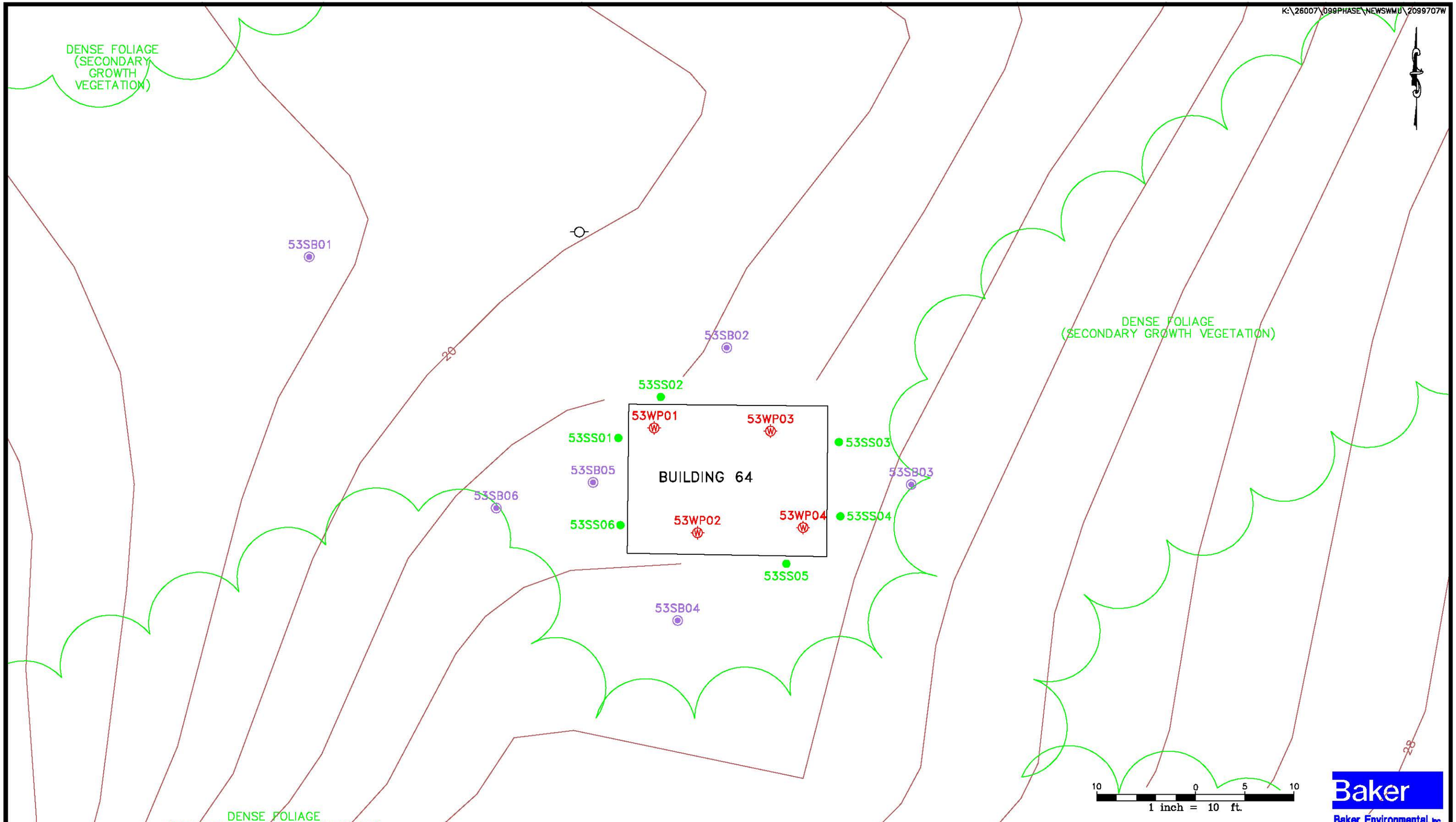
TABLE 4-7

METHOD OF CHEMICAL ANALYSIS
WATER QUALITY PARAMETERS
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Analysis	Method
Aluminum	7000 Series*
Odor	----------
Salinity	----------
Color	110.1**
TDS	160.1*
Fluoride	340.2**
Hardness	130.2**
Chloride	9250*
Iron	7000 Series*
pH (field)	----------
Manganese	7000 Series*
Corrosivity	Langlier Saturation Index
Sulfate	9035-38*
Copper	7000 Series*
Silver, and	7000 Series*
Zinc	7000 Series*

* "Methods for Chemical Analysis of Water and Wastes, "USEPA, EPA 600/4-79-020. Revised March 1983.
** "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," USEPA. SW-846

SECTION 4.0
FIGURES



LEGEND

- WIPE SAMPLE LOCATION
- SURFACE SOIL SAMPLE LOCATION
- SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
- OVERHEAD ELECTRIC UTILITY POLE
- BUILDING
- GROUND SURFACE CONTOUR LINE
- TREE LINE

SOURCE: DEPT. OF THE NAVY, SEPEMBER 1999.

FIGURE 4-1
SAMPLE LOCATIONS
SWMU 53, BUILDING 64
(MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

K:\28007\099PHASE\NEWSWMU\2099708W

SWMU 54

DENSE FOLIAGE
(SECONDARY GROWTH VEGETATION)

54SS14
54SS13
AST CONTAINMENT PAD
54SS12
54SS15
54SS02
54SS03
54SS11
TRANSFORMER STORAGE AREA
54SS01
CANOPY
BLDG. 1914
CANOPY
54TW01
OIL/WATER SEPARATOR
54SS10
OPEN STORAGE SHED
CANOPY POSTS
54SS04
54SS05
54SS09
54SS06
54TW02
54SW01
54SS08
54SW02
OPEN EXCAVATIONS
510MW4
54SS07
510MW5
BLDG. 1686
BAIROKO STREET
510MW3
510MW1
510DW1
510DW2
FORMER PUMP ISLAND LOCATION
~4,000 GALLON UST (REMOVED)
FORMER LOCATION OF BUILDING 510
510MW2
10
15
20

60 0 30 60
1 inch = 60 ft.

Baker
Baker Environmental Inc.

DENSE FOLIAGE
(SECONDARY GROWTH VEGETATION)

SWMU 26

SOURCE: DEPT. OF THE NAVY, SEPTEMBER 1999.

LEGEND

- SURFACE SOIL SAMPLE LOCATION
- EXISTING MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- TEMPORARY SHALLOW WELL LOCATION/ SUBSURFACE SOIL LOCATION
- TRANSFORMER STORAGE PALLETS
- GROUND SURFACE CONTOUR LINE
- FENCE LINE
- BUILDING
- TREE LINE
- EDGE OF GRAVEL

FIGURE 4-2
SAMPLE LOCATIONS
SWMU 54, BUILDING 1914
(NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

5.0 FIELD INVESTIGATION RESULTS

This section presents an overview of chemical analytical results obtained from samples taken during the field investigations. The objective of this section is to determine whether a release of hazardous constituents from SWMUs 53 and 54 has occurred. SWMU 53 and SWMU 54 data was obtained through sample collection and analysis of the surface and subsurface soil, groundwater, standing water, and wipe samples. The analytical results for environmental and QA/QC samples also are included in this section.

SWMU 53 and SWMU 54 specific soil sample results presented in the following sections have been compared with several criteria. Organic compounds, except TPH, detected in soil samples were compared with their respective risk-based concentrations (RBCs) for both industrial and residential conditions as determined by EPA Region III (October 5, 2000). The TPH values were compared to the Puerto Rico Environmental Quality Board (PREQB) screening guidance. Inorganic compounds were compared against the RBCs and the background analytical data. Taking twice the average of each constituent detected in the base background samples, as well as in SWMU 26 background samples for SWMU 54 developed the background screening criteria. One-half the detection limit was used for non-detects. This background value was determined in accordance with a phone conversation with Ms. Gina Ferreira. (EPA, 1999).

Organic and inorganic compounds detected in the groundwater samples were compared with the respective Tap Water RBCs as well as the Federal Maximum Contaminant Levels (MCLs) (EPA, 1999c).

The standing water samples were also compared against the respective EPA Region III Tap Water RBCs as well as the Federal MCLs.

The duplicate samples collected for QAIQC purposes are included in the results, and compared to appropriate criteria. The higher value between the environmental sample and its representative duplicate was retained for analysis. Although the duplicated samples are shown on the tables, they were not included in the total counts of the samples.

The wipe samples at SWMU 53 were not compared to criteria. The purpose for the collection of wipe samples at SWMU 53 was to determine whether pesticides/PCBs were present on the interior of the Building 64 structure.

5.1 Background Conditions

Background samples used for comparison purposes during this investigation included the inorganic analysis of surface soil, subsurface soil, and groundwater collected from a previous investigation in March of 1996. The background samples were collected from four background monitor wells locations (BGMW01 through BGMW04) located north of Gate 2 between the entrances to the Crash Crew Area and Air Operations. The full rationale for the background locations was provided in the approved RFI report for SWMUs 7/8 (Tow Way Fuel Farm) (Baker, 1997). SWMU 54 background data comparisons also included site specific background analytical data previously collected from SWMU 26 for surface and subsurface soil only. The full rationale for SWMU 26 background sample locations was provided in the Draft Additional Investigations Report for OU 1, 6, and 7 (Baker, 1998). The inorganic analytical results for surface, subsurface soil, and groundwater are presented in Appendices E.1 through E.3, respectively.

5.2 SWMU 53 - Building 64 (Malaria Control Building)

Sampling activities during this investigation at SWMU 53 involved the collection of surface and subsurface soil and wipe samples. These samples were submitted to a stateside laboratory for analysis of various parameters. The analysis of the soil samples consisted of pesticides/PCBs and Appendix IX metals. The wipe samples were analyzed for pesticides/PCBs.

5.2.1 Surface Soil

Twelve surface soil samples (and three duplicates) were collected during this investigation. A total of five pesticides: 4,4'dichlorodiphenyldichloroethane (DDD), 4,4'-dichlorodiphenyldichloroethylene (DDE), 4,4'-DDT, Heptachlor, and Heptachlor epoxide were detected as shown in Table 5-1. All but one of the samples had positive detections of pesticides. 4,4'-DDT was the only pesticide detected which exceeded any of the screening criteria for surface soil. The residential RBC was exceeded in only one of the samples (53SS02). It should be noted that this sample was located off of the downgradient side of Building 64. No other pesticides were detected above the screening criteria. A complete set of the surface soil pesticide/PCB analytical data is presented as Appendix E.

Fifteen different metals were detected in the surface soil samples as shown in Table 5-2. Of the fifteen different metals detected only five of them were detected in excess of the residential RBCs. These included antimony, arsenic, barium, vanadium, and zinc. It should be noted that all of the vanadium detections were below the background criteria. Four out of twelve of the arsenic detections were also in excess of the industrial RBCs. Lead was detected above the USEPA soil screening value of 400 mg/kg in five of the eight samples which it was detected in. A complete set of the surface soil Appendix IX metals analytical data is presented as Appendix E.

5.2.2 Subsurface Soil

A total of seven subsurface soil samples were collected during this investigation at SWMU 53. Only one pesticide: 4,4'-DDT was detected in only two of the seven samples as shown in Table 5-3. The two positive detections of 4,4'-DDT were below the screening criteria. It should be noted that these detections were from the soil borings located off of the downgradient side of Building 64. A complete set of the subsurface soil pesticide/PCB analytical data is presented as Appendix E.

Twelve different metals were detected in the subsurface soil samples as shown in Table 5-4. Of the twelve different metals detected only two of them were detected in excess of the residential RBCs and below the industrial RBCs. These included arsenic and vanadium. It should be noted that all of the arsenic and vanadium detections were below the background criteria. A complete set of the surface soil Appendix IX metals analytical data is presented as Appendix E.

5.2.3 Wipe Samples

Four wipe samples were collected inside of Building 64. Three pesticides (4,4'-DDE, 4,4'-DDT and 4,4'-DDD) were detected as shown in Table 5-5. Appendix E contains the complete set of pesticide/PCB analytical data for wipe samples.

5.3 SWMU 54 – Building 1914 (Former NEX Repair/Maintenance Shop)

Sampling activities during this investigation at SWMU 54 involved the collection of surface and subsurface soil, groundwater, and surface water. These samples were submitted to a designated laboratory for various analysis of a host of parameters. The analysis of the soil samples consisted of the following:

- Full Appendix IX List (VOCs, SVOCs, Pesticides/PCBs, organophosphorus (OP)-Pesticides, Dioxins, Chlorinated Herbicides, and Appendix IX metals).
- TPH DRO
- TPH GRO
- Groundwater Quality (groundwater samples 510MW1 and 510MW2 only)

In addition, a comparison was made between previous data obtained and analyzed during the 1995 Site Characterization Site 510 Report (BB&L, 1995) and data collected during December 2000.

5.3.1 Surface Soil

Sixteen surface soil samples (and two duplicates) were collected during this investigation as shown in Table 5-6. A total of six VOCs were detected at low levels below all the screening criteria. Toluene was detected in 13 of the 16 samples at this site. Five poly-aromatic hydrocarbons (PAH) were detected from the SVOC analysis. It should also be noted that the detection limits of benzo(a)pyrene were above the residential RBC value for all 16 of the listed samples, and above the industrial RBC screening value in 13 of the 16 samples. In Sample 54SS07, which is located outside the fenced operation area of the site, benzo(a)pyrene was detected at an estimated concentration of 580 µg/kg, which exceeds the residential RBC of 87 µg/kg. The detection limits of benzo(a)anthracene were above the residential RBC value in three out of the 16 samples. Low levels of six pesticides were detected below any of the screening criteria. 4,4'-DDE, 4,4'-DDD, and 4,4-DDT were the most frequently detected pesticides throughout the site. The levels present are most likely associated with routine application of the pesticides rather than related to the prior site operations. No PCBs, OP-pesticides, or dioxins/furans were detected in any of the samples. One chlorinated herbicide (2,4,5-TP) was detected in one sample between the building and oil water separator at a low concentration below any of the screening criteria and is not related to site activities. Appendix E presents a complete set of surface soil organic analytical data.

Table 5-6 also shows the analytical results for TPH. Diesel range organics were detected in twelve of the sixteen samples and gasoline range organics were detected in only one of the samples. All low-level positive detections were below the PREQB guidance for remediation levels of TPH in soils under the UST regulations. Appendix E presents a complete set of TPH analytical data.

A total of fourteen inorganics were detected in surface soil samples collected as presented in Table 5-7. Of these detections only arsenic, cadmium, chromium and vanadium were detected above the residential RBCs, however were below the industrial RBC values. Arsenic was detected in 15 out of the 16 samples above the residential RBC and only three of those samples were also in excess of the background screening criteria. Vanadium was detected in all of the samples in excess of the residential RBC but below the background criteria. Only one of the positive detections of cadmium was slightly above the residential RBC. All three positive detections of chromium were above the residential RBC. Appendix E presents a complete set of analytical data for surface soil inorganics.

5.3.2 Subsurface Soil

Four subsurface soil samples were collected as part of the SWMU 54 investigation. Three VOCs, one SVOCs and two pesticides were detected, however the detections were below both industrial and residential RBC values. One chlorinated herbicide resulted in a positive detection, again below screening values. There were no detections of OP-Pesticides, dioxin/furans or TPH. Table 5-8 presents the positive detections of organics, and a complete set of analytical data is included as Appendix E.

Table 5-9 shows that thirteen different metals were detected in the four subsurface soil samples that were collected as part of this investigation. Arsenic, chromium and vanadium were detected above the residential RBC values, but below the industrial RBC values. Chromium and vanadium exceeded background screening criteria in one of the four samples, while arsenic was below background screening criteria in all four subsurface soils samples. A complete set of inorganic subsurface analytical data is included as Appendix E.

5.3.3 Groundwater

A total of eleven VOCs were detected in the groundwater samples that were collected, as shown in Table 5-10. The detections were isolated to four of the monitor wells with seven of the eleven VOC detections from monitor well 510DW1. The four wells with the positive detections are located south of the site and are up-gradient of the site. It is unlikely that the detections associated with these wells are associated with the site activities at SWMU 54. These wells were associated with Site 510 and were sampled for this investigation due to the near vicinity to SWMU 54 (Appendix G). There were no VOCs detected from the two temporary wells installed during this investigation. Six of the VOCs detected were in excess of the EPA Region III Tap Water RBCs. These include 1,1-Dichloroethene, chloroform, benzene, 1,2-Dichloroethane, trichloroethane and isobutanol. Two of these VOCs (benzene and trichloroethene [TCE]) were also detected above the Federal MCLs.

There were 15 semivolatiles (SVOCs) detected in the groundwater samples as shown in Table 5-10, most of which being PAHs. The majority of the detections were from two up gradient wells at SWMU 54. Six SVOCs were detected at concentrations exceeding the Tap Water RBC values in samples 510MW1 and 510MW2. Of those detections, benzo(a)pyrene also exceeded the Federal MCL values in both samples. There were no positive detections for pesticides/PCBs, OP-pesticides, chlorinated herbicides or dioxin/furans. A complete set of organic data is presented as Appendix E.

TPH diesel range organics were detected in eight of the nine samples with values ranging from 0.2 mg/L to 6.7 mg/L. Three samples had TPH gasoline range organic detections as presented in Table 5-10. A complete set of groundwater analytical data is included as Appendix E.

Table 5-11 presents the fourteen inorganic compounds detected in groundwater samples. Beryllium was detected above the Federal MCL in one sample (54TW01) while thallium was detected above the Federal MCL in one sample 510MW2. Thallium also exceeded the tap water RBC and background screening criteria in 510MW2. Thallium was not detected in the duplicate sample nor was it detected in the other eight groundwater samples. Therefore, detections of thallium are not indicative of past releases associated with SWMU 54. A complete set of groundwater analytical data is included as Appendix E.

Analysis for groundwater quality was conducted for two samples, 510MW1 and 510MW2. Total dissolved solids, aluminum, iron and manganese were detected exceeding Secondary MCL standards in both samples. As presented in Table 5-12, Tap Water RBCs were also exceeded for aluminum, iron and manganese. Appendix E. provides a complete set of analytical results for groundwater quality.

5.3.4 Standing Water

Two samples were collected from the standing water in the two pits located at the site. No VOCs, pesticides/PCBs, OP-pesticides, chlorinated herbicides, or dioxins/furans were detected as indicated in Table 5-13. Fifteen SVOCs and diesel range organics were detected in the standing water samples that were collected at SWMU 54. It should be noted that six of the SVOCs detected were also detected in the surface soil samples from the site. Six of the SVOCs detected exceeded Tap Water RBC values in both samples as shown in Table 5-13. Of these detections, only benzo(a)pyrene exceeded both the Tap Water RBC and the Federal MCL values. Diesel range organics were detected in one sample (54SW02). A complete set of standing water analytical data is included as Appendix E. The analytical results do not indicate a release of hazardous constituents from this SWMU. The detected results are most likely associated with the exhaust from vehicular traffic in the area.

Three metals were detected in the standing water samples below the screening criteria as shown in Table 5-14. Barium, copper and vanadium were detected below the Federal MCL and Tap Water RBC values in both samples. A complete set of standing water analytical data is included as Appendix E.

5.3.5 Data Comparison to 1995 Site Characterization Site 510 Report

It should be noted that this round of sampling indicates that contaminant concentrations of BTEX in the groundwater have decreased substantially from the results reported in the 1995 Site Characterization Site 510 Report (BB&L, 1995). In the conclusions and recommendations section of the BB&L report, it was stated that natural degradation processes were expected to continue to reduce the levels of petroleum contaminants in the soils and groundwater at the site (BB&L, 1995). The December 2000 sampling results show substantial decreases in contaminant levels. For example, the 1992 laboratory results indicated that TPH was present in soil samples obtained from the UST excavation in concentrations greater than the PREQB target level of 100 mg/kg. However, TPH was

not detected above 100 mg/kg in any of the 19 soil samples analyzed for TPH during the 1995 BB&L Site Characterization (SC) Investigation. The BB&L report also stated that contamination seemed to be limited to the area of the former UST location.

It appears that natural degradation is reducing the levels of TPH and BTEX in the groundwater, in addition to the soil discussed above. For example, in the groundwater from 510DW1, benzene decreased from 4,800 μg/L in the 1995 sampling event, to 91 μg/L in the December 2000 sampling event. Likewise, in 510MW1, benzene decreased from 69 μg/L (1995 sampling event) to below detection levels (2000 sampling event), and in 510DW2 from 2.4 μg/L (1995 sampling event) to below detection levels (2000 sampling event). Total BTEX also decreased substantially from 7,590 μg/L in monitor well 510DW1 (1995 sampling event) to 145.7 μg/L in December of 2000. Concentrations for Total BTEX also decreased in 510DW2 from 11.8 μg/L (1995 sampling event) to below detection levels (2000 sampling event), and from 284 μg/L (1995 sampling event) to below detection levels (2000 sampling event) in sample location 510MW1. TPH was only detected in one monitor well, 510DW1, and it decreased from 6.1 mg/L in the 1995 sampling event to 2.04 mg/L in December of 2000. In addition, the temporary wells sampled in the December 2000 investigation did not have any positive organic detection except for two minor SVOC detections, which were below any of the screening criteria.

The only detections in the two standing water samples were those from the SVOC analysis. A few of the constituents exceeded the tap water RBC. It is highly unlikely that this small quantity of water would be utilized as a drinking water source. The level at which the constituents were detected do not indicate a release of hazardous constituents from this SWMU, rather it is most likely associated with the exhaust from vehicular traffic in the area.

Polynuclear aromatic hydrocarbons (PAHs) are a group of compounds with two or more fused aromatic rings. EPA has identified 16 PAHs as priority pollutants and seven of these are identified by EPA as probable human carcinogens. PAHs are ubiquitous chemicals produced by natural processes such as forest fires and volcanoes and anthropogenic processes including burning of fossil fuels.

Studies of urban background soils report concentrations from 0.06 to 5.8 mg/kg total carcinogenic PAHs (Menzie et al, 1992) and mean concentrations of 9 mg/kg carcinogenic PAHs and 18.4 total PAHs (Bradley et al, 1994). PAHs were also detected in surface water and groundwater background data (Menzie et al, 1992). In the standing water samples from SWMU 54 the two most commonly detected PAHs (naphthalene and 2-methylnaphthalene) were not detected even though they are more soluble than the detected PAHs by a factor between 30 and 40,000. Furthermore, duplicate samples of standing water sample 54SW01 and groundwater from 510MW2 show poor reproducibility of the data suggesting that the low levels detected are also uncertain.

5.4 Quality Assurance/Quality Control Sample Results

The QA/QC sampling efforts consisted of the collection of equipment rinsate samples, field blanks, and trip blanks. The results from the analysis of these samples are discussed in the following subsections.

5.4.1 Equipment Rinsate Samples

Two equipment rinsate samples (53ER01 and 53ER02) were collected and analyzed for pesticides/PCBs and inorganics during the field investigation of SWMU 53. Sample 53ER01 was collected from a stainless steel spoon while 53ER02 was collected from a stainless steel split spoon.

There were not any pesticides/PCBs detected in the equipment rinsate samples. Chromium and nickel were detected in 53ER02. Table 5-15 presents a summary of all detected equipment rinsate samples. Appendix F.1 presents a complete set of Pesticide/PCB analytical data and Appendix F.2 presents inorganics.

Three equipment rinsate samples were collected at SWMU 54 and analyzed for full Appendix IX list and TPH DRO and GRO. 54ER01 was collected from a stainless steel spoon, 54ER02 from a stainless steel split spoon and 54ER03 from a disposable bailer. Di-n-butylphthalate, bis(2-ethylhexyl)phthalate, and arsenic were detected from the stainless steel split spoon equipment rinsate sample as indicated in Tables 5-16 and 5-17. Benzo(g,h,i)perylene was detected in the rinsate sample of the stainless steel spoon. No VOCs, pesticides/PCBs, OP-pesticides, chlorinated herbicides, or dioxins/furans were detected. The low levels of detections in the equipment rinsate samples do not

negatively impact the results from the samples associated with the sampling equipment. Appendix F.3 shows all analysis for organics in equipment rinsate samples while Appendix F.4 includes a complete set of analytical results for inorganics in equipment rinsate samples for SWMU 54.

5.4.2 Field Blank Samples

Three field blank samples (2000FB01 through 2000FB03) were collected during the December 2000 field investigation. The water analyzed included lab-grade deionized water (2000FB01), store bought deionized water (2000FB02) and NSRR water supply (2000FB03). The NSRR water supply was taken from a spigot at the Tow Way Fuel Farm Pump House. Table 5-18 presents a summary of all detected organics in the field blank samples. Three VOCs and seven SVOCs were detected in 2000FB03 and one SVOC in 2000FB02. There was also a detection of diesel range organics in 2000FB02. No pesticides/PCBs, OP-pesticides, chlorinated herbicides, or dioxins/furans were detected. Appendix F.5 is a complete set of analytical data for organic field blank samples. A total of six metals were detected in field blank samples as indicated in Table 5-19. Appendix F.6 includes a complete set of analytical data for inorganics.

5.4.3 Trip Blank Samples

A total of 6 trip blanks were analyzed as part of the SWMUs 53 and 54 field investigation and analyzed for volatiles and TPH GRO. There were no positive detections of VOCs or TPH GRO in the trip blank samples. A complete set of groundwater analytical data is included as Appendix F.7.

5.5 Data Validation

A detailed and independent data validation was performed by Heartland Environmental Services, Inc. to verify the qualitative and quantitative reliability of the data presented and adherence to stated analytical protocols. This review included a detailed review and interpretation of all the data generated by the laboratory for data quality Level D deliverables. The primary tools that were utilized by the experienced data validation personnel included analytical method operating procedures, Statement of Work (SOW) for CLP guidance documents, EPA Region II guidelines for data validation, established criteria, and professional judgement.

The data validation reports stated that the overall laboratory performance was acceptable. The overall quality of the data package is acceptable. The reported results are accepted as reported by the laboratory with the noted qualifications. The data reviewer estimated that less than 10 percent of the data required qualifications. Data validation reports were prepared by the data validator, which provided the back-up information accompanying the qualifying statements, presented in the QA review. Copies of the narratives from the data validation reports associated with this investigation are provided as Appendix H.

SECTION 5.0 TABLES

TABLE 5-1

SUMMARY OF PESTICIDES/PCBs DETECTIONS IN SURFACE SOIL
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	EPA Region III Industrial RBC	**EPA Region III Residential RBC**	53SS01	53SS02	53SS03	53SS04	53SS05	53SS06	53SS06D	53SB01-00
Sample Date			12/13/00	12/13/00	12/13/00	12/13/00	12/13/00	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	ug/kg	ug/kg	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Pesticides/PCBs (ug/kg)										
4,4'-DDD	24,000	2,700	38 UJ	430 UJ	7.8 UJ	48 J	4.2 UJ	21 J	71 J	4.5 U
4,4'-DDE	17,000	1,900	300 J	970	28	310	8	140 J	360 J	4.5 U
4,4'-DDT	17,000	1,900	290 J	**5,100 J**	80 J	230	14	85 J	390 J	4.5 U
Heptachlor	1,300	140	19 U	220 U	4 U	39 U	2.2 U	19 U	37 U	2.3 U
Heptachlor epoxide	630	70	19 UJ	220 UJ	4 UJ	39 UJ	2.2 UJ	3.2 J	37 UJ	2.3 U

Notes:
ug/kg = micrograms per kilogram.
ft/bgs = feet below ground surface.
U = Not Deteced.
J = Estimated Value.
NJ = Result is considered present at an estimated concentration.
UJ = report quantitation limit is qualified as estimated.

TABLE 5-1

SUMMARY OF PESTICIDES/PCBs DETECTIONS IN SURFACE SOIL
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	EPA Region III Industrial RBC	**EPA Region III Residential RBC**	53SB02-00	53SB02-00D	53SB03-00	53SB04-00	53SB04-00D	53SB05-00	53SB06-00
Sample Date			12/14/00	12/14/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00
Depth (ft bgs)	ug/kg	ug/kg	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Pesticides/PCBs (ug/kg)									
4,4'-DDD	24,000	2,700	12 J	4 J	4.1 U	8.5 U	4.2 U	370 UJ	3.6 UJ
4,4'-DDE	17,000	1,900	47 J	25 J	0.5 J	19	11	390 NJ	32
4,4'-DDT	17,000	1,900	340 J	150 J	1.4 J	38	14	1,200 J	25
Heptachlor	1,300	140	24 U	4.6 U	2.1 U	0.34 J	2.2 U	190 U	1.9 U
Heptachlor epoxide	630	70	24 U	4.6 U	2.1 U	4.4 U	2.2 U	190 UJ	0.43 J

Notes:
ug/kg = micrograms per kilogram.
ft/bgs = feet below ground surface.
U = Not Deteced.
J = Estimated Value.
NJ = Result is considered present at an estimated concentration.
UJ = report quantitation limit is qualified as estimated.

TABLE 5-1

SUMMARY OF PESTICIDES/PCBs DETECTIONS IN SURFACE SOIL
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date Depth (ft bgs)	EPA Region III Industrial RBC ug/kg	**EPA Region III Residential RBC** ug/kg	Number Exceeding EPA Region III Industrial RBCs	Range Exceeding EPA Region III Industrial RBCs	**Number Exceeding EPA Region III Residential RBCs**	**Range Exceeding EPA Region III Residential RBCs**	Location Maximum Detect
Pesticides/PCBs (ug/kg)							
4,4'-DDD	24,000	2,700	0/12		0/12		53SS06D
4,4'-DDE	17,000	1,900	0/12		0/12		53SS02
4,4'-DDT	17,000	1,900	0/12		1/12	5,100J	53SS02
Heptachlor	1,300	140	0/12		0/12		53SB04-00
Heptachlor epoxide	630	70	0/12		0/12		53SS06

Notes:
ug/kg = micrograms per kilogram.
ft/bgs = feet below ground surface.
U = Not Deteced.
J = Estimated Value.
NJ = Result is considered present at an estimated concentration.
UJ = report quantitation limit is qualified as estimated.

TABLE 5-2

SUMMARY OF INORGANIC DETECTIONS IN SURFACE SOIL
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	EPA Region III Industrial RBC	**EPA Region III Residential RBC**	2 x Average Detected Background	53SS01	53SS02	53SS03	53SS04	53SS05	53SS06	53SS06D	53SB01-00
Sample Date				12/13/00	12/13/00	12/13/00	12/13/00	12/13/00	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	mg/kg	mg/kg	mg/kg	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Metals (mg/kg)											
Antimony	82	3.1	ND	0.53 J	0.97 J	3.1 J	**6.1** J	1.5 J	**5.9** J	0.71 J	2.5 UJ
Arsenic	3.8	0.43	2.4	**5.6**	**1.5**	**3.1**	**3.1**	**1.3**	**4.7**	**2.2**	**2.3** J
Barium	14,000	550	181	170 J	110 J	390 J	**670** J	200 J	**630** J	160 J	100 J
Beryllium	410	16	0.45	0.2 J	0.38 J	0.33 J	0.29 J	0.21 J	0.21	0.15 J	0.28 J
Cadmium	100	3.9	ND	0.94	0.81	1.6	2.1	2.8	3.6	1.1	0.54 J
Chromium	310,000	12,000	59.0	39 J	59 J	87 J	130 J	52 J	62 J	26 J	45 J
Cobalt	12,000	470	44.0	35	57	47	40	33	31	24	38
Copper	8,200	310	234	87 J	84 J	79 J	70 J	120 J	99 J	110 J	83
Lead	400[1]	400[1]	15.3	300	120	**2,500**	**3,600**	**900**	**3,900**	**470**	11 R
Mercury	20	0.78	0.11	0.021 J	0.056 J	0.046 J	0.061 J	0.027 J	0.069 J	0.013 J	0.018 J
Nickel	4,100	160	17.0	25	23	25	24	23	18	13	24
Selenium	1,000	39	1.46	1 U	1.2 U	1	0.71 J	0.72 J	0.59 J	1 U	1.2 U
Tin	120,000	4,700	2.42	5.2 U	6 U	20	10	35	6.5	5 U	6.2 U
Vanadium	1,400	55	355	**170**	**180**	**170**	**160**	**170**	**150**	**130**	**170**
Zinc	61,000	2,300	125	580	350	2,200	**3,100**	**3,300**	**5,800**	1,600	83 J

Notes:

[1] = Soil Screening Value USPEA 1996.
ft/bgs = feet below ground surface.
mg/kg = milligrams per kilogram.
U = Not Deteced.
J = Estimated Value.
UJ = report quantitation limit is qualified as estimated.
R = Result is rejected and unusable.
ND = Not Detected.

TABLE 5-2 (continued)

SUMMARY OF INORGANIC DETECTIONS IN SURFACE SOIL
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date Depth (ft bgs)	EPA Region III Industrial RBC mg/kg	**EPA Region III Residential RBC** mg/kg	2 x Average Detected Background mg/kg	53SB02-00 12/14/00 0.0-1.0	53SB02-00D 12/14/00 0.0-1.0	53SB03-00 12/14/00 0.0-1.0	53SB04-00 12/14/00 0.0-1.0	53SB04-00D 12/14/00 0.0-1.0	53SB05-00 12/13/00 0.0-1.0	53SB06-00 12/13/00 0.0-1.0
Metals (mg/kg)										
Antimony	82	3.1	ND	1.2 J	0.8 J	2.2 UJ	2.3 UJ	1.1 J	2.8 J	2 UJ
Arsenic	3.8	0.43	2.4	**3.4** J	**2.7**	**0.86** J	**2.9**	**4.7**	**5.6**	**1.1**
Barium	14,000	550	181	120 J	100 J	120 J	82 J	100 J	270 J	68 J
Beryllium	410	16	0.45	0.24 J	0.2 J	0.25 J	0.17 J	0.19 J	0.17 J	0.16 J
Cadmium	100	3.9	ND	1.5 J	0.87 J	0.48 J	1.2 J	1.5 J	2.3	0.47 J
Chromium	310,000	12,000	59.0	32 J	33 J	42 J	35 J	38 J	38 J	29 J
Cobalt	12,000	470	44.0	20	20	27	21	24	25	22
Copper	8,200	310	234	85	69	68	75	86	89 J	76 J
Lead	400[1]	400[1]	15.3	150 R	220 R	81 R	120 R	210 R	**2,200**	55
Mercury	20	0.78	0.11	0.047 J	0.041 J	0.028 J	0.039 J	0.043 J	0.037 J	0.011 J
Nickel	4,100	160	17.0	15	17	17	18	17	18	17
Selenium	1,000	39	1.46	1.4 U	1 J	0.58 J	0.72 J	0.65 J	1.3	1 U
Tin	120,000	4,700	2.42	16 J	6.1 J	5.6 U	6.2 J	6.7 J	6.4	5 U
Vanadium	1,400	55	355	**110**	**110**	**150**	**110**	**130**	**140**	**130**
Zinc	61,000	2,300	125	1,000 J	530 J	300 J	530 J	750 J	**2,400**	120

Notes:
[1] = Soil Screening Value USPEA 1996.
ft/bgs = feet below ground surface.
mg/kg = milligrams per kilogram.
U = Not Deteced.
J = Estimated Value.
UJ = report quantitation limit is qualified as estimated.
R = Result is rejected and unusable.
ND = Not Detected.

TABLE 5-2 (continued)

SUMMARY OF INORGANIC DETECTIONS IN SURFACE SOIL
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date Depth (ft bgs)	EPA Region III Industrial RBC mg/kg	**EPA Region III Residential RBC** mg/kg	2 x Average Detected Background mg/kg	Number Exceeding EPA Region III Industrial RBCs	Range Exceeding EPA Region III Industrial RBCs	**Number Exceeding EPA Region III Residential RBCs**	**Range Exceeding EPA Region III Residential RBCs**	Number Exceeding 2 x Average Detected Background	Range Exceeding 2 x Average Detected Background
Metals (mg/kg)									
Antimony	82	3.1	ND	0/12		2/12	5.9J-6.1J	11/12	0.53J-6.1J
Arsenic	3.8	0.43	2.4	4/12	4.7-5.6	12/12	0.86J-5.6	9/12	2.7-5.6
Barium	14,000	550	181	0/12		2/12	630J-670J	5/12	200J-670J
Beryllium	410	16	0.45	0/12		0/12		0/12	
Cadmium	100	3.9	ND	0/12		0/12		12/12	0.47J-3.6
Chromium	310,000	12,000	59.0	0/12		0/12		3/12	62J-130J
Cobalt	12,000	470	44.0	0/12		0/12		2/12	47-57
Copper	8,200	310	234	0/12		0/12		0/12	
Lead	400[(1)]	400[(1)]	15.3	5/8	900-3,900	5/8	900-3,900	8/8	55-3,900
Mercury	20	0.78	0.11	0/12		0/12		0/12	
Nickel	4,100	160	17.0	0/12		0/12		9/12	18-25
Selenium	1,000	39	1.46	0/12		0/12		0/12	
Tin	120,000	4,700	2.42	0/12		0/12		9/12	6.1J-35
Vanadium	1,400	55	355	0/12		12/12	110-180	0/12	
Zinc	61,000	2,300	125	0/12		4/12	2,400-5,800	10/12	350-5,800

Notes:
[(1)] = Soil Screening Value USPEA 1996.
ft/bgs = feet below ground surface.
mg/kg = milligrams per kilogram.
U = Not Deteced.
J = Estimated Value.
UJ = report quantitation limit is qualified as estimated.
R = Result is rejected and unusable.
ND = Not Detected.

TABLE 5-2 (continued)

SUMMARY OF INORGANIC DETECTIONS IN SURFACE SOIL
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date Depth (ft bgs)	EPA Region III Industrial RBC mg/kg	**EPA Region III Residential RBC** mg/kg	2 x Average Detected Background mg/kg	Location Maximum Detect
Metals (mg/kg)				
Antimony	82	3.1	ND	53SS04
Arsenic	3.8	0.43	2.4	53SS01/53SB05-00
Barium	14,000	550	181	53SS04
Beryllium	410	16	0.45	53SS02
Cadmium	100	3.9	ND	53SS06
Chromium	310,000	12,000	59.0	53SS04
Cobalt	12,000	470	44.0	53SS02
Copper	8,200	310	234	53SS05
Lead	400[(1)]	400[(1)]	15.3	53SS06
Mercury	20	0.78	0.11	53SS06
Nickel	4,100	160	17.0	53SS01
Selenium	1,000	39	1.46	53SB05-00
Tin	120,000	4,700	2.42	53SS03
Vanadium	1,400	55	355	53SS02
Zinc	61,000	2,300	125	53SS06

Notes:
[(1)] = Soil Screening Value USPEA 1996.
ft/bgs = feet below ground surface.
mg/kg = milligrams per kilogram.
U = Not Deteced.
J = Estimated Value.
UJ = report quantitation limit is qualified as estimated.
R = Result is rejected and unusable.
ND = Not Detected.

TABLE 5-3

SUMMARY OF PESTICIDES/PCBs DETECTIONS IN SUBSURFACE SOIL
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

	EPA Region III	**EPA Region III**							
Sample ID	Industrial	**Residential**	53SB01-03	53SB01-05	53SB02-02	53SB03-01	53SB04-02	53SB05-02	53SB06-03
Sample Date	RBC	**RBC**	12/14/00	12/14/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00
Depth (ft bgs)	ug/kg	ug/kg	4.0-6.0	8.0-10.0	2.0-4.0	0.0-2.0	4.0-5.5	2.0-4.0	4.0-6.0
Pesticides/PCBs (ug/kg)									
4,4'-DDT	17,000	1,900	4.2 U	3.7 U	3.6 U	3.8 U	3.7 U	24 J	1.1 J

Notes:
ug/kg = micrograms per kilogram.
ft/bgs = feet below ground surface.
U = Not Deteced.
J = Estimated Value.

TABLE 5-3 (continued)

SUMMARY OF PESTICIDES/PCBs DETECTIONS IN SUBSURFACE SOIL
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date Depth (ft bgs)	EPA Region III Industrial RBC ug/kg	**EPA Region III Residential RBC** ug/kg	Number Exceeding EPA Region III Industrial RBCs	Range Exceeding EPA Region III Industrial RBCs	**Number Exceeding EPA Region III Residential RBCs**	**Range Exceeding EPA Region III Residential RBCs**	Location Maximum Detect
Pesticides/PCBs (ug/kg)							
4,4'-DDT	17,000	1,900	0/7		0/7		53SB05-02

Notes:
ug/kg = micrograms per kilogram.
ft/bgs = feet below ground surface.
U = Not Deteced.
J = Estimated Value.

TABLE 5-4

SUMMARY OF INORGANIC DETECTIONS IN SUBSURFACE SOIL
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date Depth (ft bgs)	EPA Region III Industrial RBC mg/kg	**EPA Region III Residential RBC** mg/kg	2 x Average Detected Background mg/kg	53SB01-03 12/14/00 4.0-6.0	53SB01-05 12/14/00 8.0-10.0	53SB02-02 12/14/00 2.0-4.0	53SB03-01 12/14/00 0.0-2.0	53SB04-02 12/14/00 4.0-5.5	53SB05-02 12/13/00 2.0-4.0	53SB06-03 12/13/00 4.0-6.0
Metals (mg/kg)										
Arsenic	3.8	0.43	2.05	**1.6** J	**0.79** J	**0.61** J	**0.59** J	**1.6**	**0.56** J	**0.88** J
Barium	14,000	550	222	43 J	1.5 J	57 J	170 J	130 J	160 J	130 J
Beryllium	410	16	0.74	0.81	0.19 J	0.17 J	0.28 J	0.27 J	0.24 J	0.42 J
Cadmium	100	3.9	0.74	0.46 J	0.24 J	0.36 J	0.37 J	0.54 J	0.24 J	0.31 J
Chromium	310,000	12,000	133	28 J	8 J	82 J	73 J	150 J	50 J	70 J
Cobalt	12,000	470	30	44	7.8	23	38	33	53	56
Copper	8,200	310	193	74	75	100	84	54	57 J	9.2 J
Lead	400[(1)]	400[(1)]	8.68	0.87 R	0.73 R	0.77 R	7.8 R	8.3 R	10	2.8
Mercury	20	0.78	0.09	0.023 UJ	0.0029 J	0.02 UJ	0.019 UJ	0.022 UJ	0.013 J	0.021 UJ
Nickel	4,100	160	31.9	19	12	42	30	40	18	32
Vanadium	1,400	55	462	**170**	**110**	**120**	**150**	**140**	**120**	**120**
Zinc	61,000	2,300	89.0	76 J	47 J	36 J	46 J	80 J	36	60

Notes:
mg/kg = milligrams per kilogram.
ft/bgs = feet below ground surface.
J = Estimated Value.
UJ = report quantitation limit is qualified as estimated.
R = Result is rejected and unusable.

TABLE 5-4 (continued)

SUMMARY OF INORGANIC DETECTIONS IN SUBSURFACE SOIL
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date Depth (ft bgs)	EPA Region III Industrial RBC mg/kg	**EPA Region III Residential RBC** mg/kg	2 x Average Detected Background mg/kg	Number Exceeding EPA Region III Industrial RBCs	Range Exceeding EPA Region III Industrial RBCs	**Number Exceeding EPA Region III Residential RBCs**	**Range Exceeding EPA Region III Residential RBCs**	Number Exceeding 2 x Average Detected Background	Range Exceeding 2 x Average Detected Background	Location Maximum Detect
Metals (mg/kg)										
Arsenic	3.8	0.43	2.05	0/7		7/7	0.56J-1.6	0/7		53SB04-02
Barium	14,000	550	222	0/7		0/7		0/7		53SB03-01
Beryllium	410	16	0.74	0/7		0/7		1/7	0.81	53SB01-03
Cadmium	100	3.9	0.74	0/7		0/7		0/7		53SB04-02
Chromium	310,000	12,000	133	0/7		0/7		1/7	150J	53SB04-02
Cobalt	12,000	470	30	0/7		0/7		5/7	33-56	53SB06-03
Copper	8,200	310	193	0/7		0/7		0/7		53SB02-02
Lead	400[(1)]	400[(1)]	8.68	0/2		0/2		1/2	10	53SB05-02
Mercury	20	0.78	0.09	0/7		0/7		0/7		53SB05-02
Nickel	4,100	160	31.9	0/7		0/7		3/7	32-42	53SB02-02
Vanadium	1,400	55	462	0/7		7/7	110-170	0/7		53SB01-03
Zinc	61,000	2,300	89.0	0/7		0/7		0/7		53SB04-02

Notes:
mg/kg = milligrams per kilogram.
ft/bgs = feet below ground surface.
J = Estimated Value.
UJ = report quantitation limit is qualified as estimated.
R = Result is rejected and unusable.

TABLE 5-5

SUMMARY OF PESTICIDES/PCBs DETECTIONS IN WIPE SAMPLES
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	53WP01	53WP02	53WP03	53WP04
Sample Date	12/17/00	12/17/00	12/17/00	12/17/00
Pesticides/PCBs (ug/wipe)				
4,4'-DDE	5.5 J	1.1	1.6	0.47
4,4'-DDD	0.4 UJ	0.1 UJ	0.12 J	0.2 UJ
4,4'-DDT	17 D	1.4	1.1	3.7

Notes:
ug/wipe = micrograms per wipe.
J = Estimated value.
UJ = Reported quantitation limit is qualified as estimated.
D = Result value is based on dilution analysis.

TABLE 5-6

SUMMARY OF ORGANIC DETECTIONS IN SURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID			54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08	54SS09
Site ID	EPA Region III	**EPA Region III**	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08	54SS09
Sample Date	Industrial	**Residential**	12/13/00	12/13/00	12/13/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00	12/14/00	12/14/00
Depth (ft bgs)	RBC	**RBC**	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
	ug/kg	ug/kg										
Volatiles (ug/kg)												
Methylene chloride	763,093	85,163	5.5 U	5.4 U	6.8	4.2 J	4.1 J	3.2 J	5.6 U	5.5 U	9.1	6.4
Toluene	40,880,000	1,564,286	7.8	10	2.7 J	2.1 J	5.6 U	3 J	2.7 J	4.4 J	15	13
Chlorobenzene	4,088,000	156,429	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	18	7.8 U	5.5 U
Ethylbenzene	20,440,000	782,143	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U	5.5 U
Styrene	40,880,000	1,564,286	5.5 U	2.1 J	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U	2.4 J
Acetone	20,440,000	782,143	55 U	54 U	66 U	56 U	56 UJ	54 U	56 U	55 U	78 U	55 U
Semivolatiles (ug/kg)												
Phenanthrene	6,132,000	234,643	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	220 J	5,200 U	3,600 U
Fluoranthene	8,176,000	312,857	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	420 J	630 J	5,200 U	3,600 U
Benzo(a)anthracene	7,840	875	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	350 J	5,200 U	3,600 U
bis(2-Ethylhexyl)phthalate	408,800	45,623	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U	3,600 U
Benzo(k)fluoranthene	78,400	8,750	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	560 J	5,200 U	3,600 U
Benzo(a)pyrene	784	87	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	**580** J	5,200 U	3,600 U
Pesticides/PCBs (ug/kg)												
Heptachlor	1,272	142	9.6 UJ	9.2 UJ	2.2 UJ	9.6 UJ	9.6 UJ	1.8 J	3.8 UJ	1.9 UJ	13 UJ	9.3 UJ
4,4'-DDE	16,833	1,879	9.1 J	51 J	9.8 J	5.4 J	9.6 J	6.7 J	28 J	22 J	3.3 J	18 J
Dieldrin	358	40	19 UJ	18 UJ	4.3 UJ	18 UJ	18 UJ	3.6 UJ	7.4 UJ	3.6 UJ	5.4 J	18 UJ
4,4'-DDD	23,847	2,661	19 U	18 U	2.5 J	18 U	18 U	1.2 J	6.9 J	2.3 J	26 U	18 U
4,4'-DDT	16,833	1,879	19 U	15 J	4.3 U	18 U	18 U	1.7 J	2 J	4.6	2.8 J	2.3 J
Endrin aldehyde	61,320	2,346	19 UJ	18 UJ	4.3 UJ	18 UJ	1.9 J	3.6 UJ	7.4 UJ	3.6 UJ	26 UJ	18 UJ

Notes:

ug/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.

J = Estimated value.
U = Not Detected.
UJ = Report quantitation limit is qualified as estimated.

ft bgs = feet below ground surface.
NE = Not Established.
(1) PREQB guidance for Remediation Levels of TPH in soils under UST regulations.

OP-Pesticides (ug/kg)

TABLE 5-6 (continued)

SUMMARY OF ORGANIC DETECTIONS IN SURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID			54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08	54SS09
Site ID	EPA Region III	**EPA Region III**	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08	54SS09
Sample Date	Industrial	**Residential**	12/13/00	12/13/00	12/13/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00	12/14/00	12/14/00
Depth (ft bgs)	RBC	**RBC**	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
	ug/kg	ug/kg										
Not Detected												
Chlorinated Herbicides (ug/kg)												
2,4,5-TP	1,635,200	62,571	9.4 U	9 U	11 U	1.4 J	9.3 U	9 U	9.3 U	9.1 U	13 U	9.1 U
Dioxin/Furans (ug/kg)												
Not Detected												
TPH (mg/kg)												
Diesel Range Organics	100,000[(1)]	100,000[(1)]	7.5 U	5.7 J	320	33 J	95 J	47	35	28	36	14
Gasoline Range Organics	100,000[(1)]	100,000[(1)]	0.28 U	0.27 U	0.33 U	0.29 U	0.28 U	0.27 U	0.11 J	0.27 U	0.38 U	0.27 U

Notes:
ug/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
J = Estimated value.
U = Not Detected.
UJ = Report quantitation limit is qualified as estimated.
NE = Not Established.
ft bgs = feet below ground surface.
(1) PREQB guidance for Remediation Levels of TPH in soils under UST regulations.

TABLE 5-6 (continued)

SUMMARY OF ORGANIC DETECTIONS IN SURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID			54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00		
Site ID	EPA Region III	**EPA Region III**	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01	Number	Range
Sample Date	Industrial	**Residential**	12/20/00	12/20/00	12/13/00	12/14/00	12/14/00	12/13/00	12/13/00	12/15/00	Exceeding	Exceeding
Depth (ft bgs)	RBC	**RBC**	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	EPA Region III	EPA Region III
	ug/kg	ug/kg									Industrial Soil	Industrial Soil
											RBCs	RBCs
Volatiles (ug/kg)												
Methylene chloride	763,093	85,163	6 UJ	5.6 UJ	5.8 U	3.7 J	4 J	5.6 U	5.5 U	5.4 UJ	0/18	
Toluene	40,880,000	1,564,286	6 U	5.6 U	6.7	5.6 U	6.1 U	15	4.6 J	2.8 J	0/18	
Chlorobenzene	4,088,000	156,429	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U	0/18	
Ethylbenzene	20,440,000	782,143	6 U	3.8 J	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U	0/18	
Styrene	40,880,000	1,564,286	6 U	22	5.8 U	5.6 U	6.1 U	2.5 J	5.5 U	5.4 U	0/18	
Acetone	20,440,000	782,143	48 J	9.6 J	58 U	4.2 J	61 U	56 U	55 U	54 U	0/18	
Semivolatiles (ug/kg)												
Phenanthrene	6,132,000	234,643	400 U	370 U	3,800 U	3,700 U	4,000 U	3,700 U	3,600 U	3,500 U	0/18	
Fluoranthene	8,176,000	312,857	400 U	370 U	3,800 U	3,700 U	4,000 U	3,700 U	3,600 U	3,500 U	0/18	
Benzo(a)anthracene	7,840	875	400 U	370 U	3,800 U	3,700 U	4,000 U	3,700 U	3,600 U	3,500 U	0/18	
bis(2-Ethylhexyl)phthalate	408,800	45,623	400 U	370 U	3,800 U	530 J	4,000 U	3,700 U	3,600 U	3,500 U	0/18	
Benzo(k)fluoranthene	78,400	8,750	400 U	370 U	3,800 U	3,700 U	4,000 U	3,700 U	3,600 U	3,500 U	0/18	
Benzo(a)pyrene	784	87	400 U	370 U	3,800 U	3,700 U	4,000 U	3,700 U	3,600 U	3,500 U	0/18	
Pesticides/PCBs (ug/kg)												
Heptachlor	1,272	142	2 UJ	1.9 UJ	9.9 UJ	7.6 UJ	2.1 UJ	7.6 UJ	3.7 UJ	1.8 UJ	0/18	
4,4'-DDE	16,833	1,879	18	16	15 J	46 J	14 J	43 J	36 J	11	0/18	
Dieldrin	358	40	4 U	3.7 U	19 UJ	15 UJ	4 UJ	15 UJ	7.2 UJ	3.5 U	0/18	
4,4'-DDD	23,847	2,661	2.4 J	3.7 U	19 U	15 UJ	1.1 J	3.5 J	1.9 J	1.6 J	0/18	
4,4'-DDT	16,833	1,879	1.9 J	2.1 J	3.5 J	4.5 J	1.2 J	7.5 J	5.6 J	3.4 J	0/18	
Endrin aldehyde	61,320	2,346	4 U	3.7 U	19 UJ	15 UJ	4 UJ	15 UJ	7.2 UJ	3.5 U	0/18	

Notes:

ug/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.

J = Estimated value.
U = Not Detected.
UJ = Report quantitation limit is qualified as estimated.

ft bgs = feet below ground surface.
NE = Not Established.
(1) PREQB guidance for Remediation Levels of TPH in soils under UST regulations.

OP-Pesticides (ug/kg)

TABLE 5-6 (continued)

SUMMARY OF ORGANIC DETECTIONS IN SURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID			54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00		
Site ID	EPA Region III	**EPA Region III**	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01	Number	Range
Sample Date	Industrial	**Residential**	12/20/00	12/20/00	12/13/00	12/14/00	12/14/00	12/13/00	12/13/00	12/15/00	Exceeding	Exceeding
Depth (ft bgs)	RBC	**RBC**	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	EPA Region III	EPA Region III
	ug/kg	ug/kg									Industrial Soil	Industrial Soil
											RBCs	RBCs
Not Detected												
Chlorinated Herbicides (ug/kg)												
2,4,5-TP	1,635,200	62,571	10 UJ	9.2 UJ	9.6 U	9.3 U	10 U	9.2 U	9.1 U	8.9 UJ	0/18	
Dioxin/Furans (ug/kg)												
Not Detected												
TPH (mg/kg)												
Diesel Range Organics	100,000[(1)]	100,000[(1)]	4 U	3.7 U	490	17 J	23	32	33	3.5 U	0/18	
Gasoline Range Organics	100,000[(1)]	100,000[(1)]	0.33 UJ	0.29 U	0.28 UJ	0.28 U	0.32 U	0.28 U	0.27 U	0.27 U	0/18	

Notes:
ug/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
J = Estimated value.
U = Not Detected.
UJ = Report quantitation limit is qualified as estimated.
NE = Not Established.
ft bgs = feet below ground surface.
(1) PREQB guidance for Remediation Levels of TPH in soils u
UST regulations.

TABLE 5-6 (continued)

SUMMARY OF ORGANIC DETECTIONS IN SURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Site ID Sample Date Depth (ft bgs)	EPA Region III Industrial RBC ug/kg	**EPA Region III Residential RBC ug/kg**	**Number Exceeding EPA Region III Residential Soil RBCs**	**Range Exceeding EPA Region III Residential Soil RBCs**	Location of Maximum Detection
Volatiles (ug/kg)					
Methylene chloride	763,093	85,163	0/18		54SS08
Toluene	40,880,000	1,564,286	0/18		54SS14
Chlorobenzene	4,088,000	156,429	0/18		54SS07
Ethylbenzene	20,440,000	782,143	0/18		54SS11
Styrene	40,880,000	1,564,286	0/18		54SS11
Acetone	20,440,000	782,143	0/18		54SS10
Semivolatiles (ug/kg)					
Phenanthrene	6,132,000	234,643	0/18		54SS07
Fluoranthene	8,176,000	312,857	0/18		54SS07
Benzo(a)anthracene	7,840	875	0/18		54SS07
bis(2-Ethylhexyl)phthalate	408,800	45,623	0/18		54SS13
Benzo(k)fluoranthene	78,400	8,750	0/18		54SS07
Benzo(a)pyrene	784	87	1/18	580J	54SS07
Pesticides/PCBs (ug/kg)					
Heptachlor	1,272	142	0/18		54SS05
4,4'-DDE	16,833	1,879	0/18		54SS02
Dieldrin	358	40	0/18		54SS08
4,4'-DDD	23,847	2,661	0/18		54SS06
4,4'-DDT	16,833	1,879	0/18		54SS02
Endrin aldehyde	61,320	2,346	0/18		54SS04D
OP-Pesticides (ug/kg)					

Notes:

ug/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
J = Estimated value.
U = Not Detected.
UJ = Report quantitation limit is qualified as estimated.

ft bgs = feet below ground surface.
NE = Not Established.
(1) PREQB guidance for Remediation Levels of TPH in soils under UST regulations.

TABLE 5-6 (continued)

SUMMARY OF ORGANIC DETECTIONS IN SURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Site ID Sample Date Depth (ft bgs)	EPA Region III Industrial RBC ug/kg	**EPA Region III Residential RBC ug/kg**	**Number Exceeding EPA Region III Residential Soil RBCs**	**Range Exceeding EPA Region III Residential Soil RBCs**	Location of Maximum Detection
Not Detected					
Chlorinated Herbicides (ug/kg)					
2,4,5-TP	1,635,200	62,571	0/18		54SS04
Dioxin/Furans (ug/kg)					
Not Detected					
TPH (mg/kg)					
Diesel Range Organics	100,000[(1)]	100,000[(1)]	0/18		54SS12
Gasoline Range Organics	100,000[(1)]	100,000[(1)]	0/18		54SS06

Notes:
ug/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
J = Estimated value.
U = Not Detected.
UJ = Report quantitation limit is qualified as estimated.
NE = Not Established.
ft bgs = feet below ground surface.
[(1)] PREQB guidance for Remediation Levels of TPH in soils u
UST regulations.

TABLE 5-7

SUMMARY OF INORGANIC DETECTIONS IN SURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	EPA Region III	**EPA Region III**	2 x Average	54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08
Site ID	Industrial	**Residential**	Detected	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08
Sample Date	RBC	**RBC**	Background	12/13/00	######	12/13/00	12/14/00	12/14/00	######	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	mg/kg	mg/kg	mg/kg	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Metals (mg/kg)												
Antimony	82	3.1	ND	2.1 UJ	0.5 J	2.4 UJ	2 UJ	2.2 UJ	2.2 UJ	2 UJ	2.2 UJ	2.8 UJ
Arsenic	3.8	0.43	2.6	1 U	**1.4**	**2.2**	**0.95** J	**0.87** J	**2.7**	**1.4**	**2.3**	**3.4**
Barium	14,000	550	181.2	41	39	41	59	52	36	46	41	61
Beryllium	410	16	1.09	0.06 J	0.15 J	0.13 J	0.13 J	0.13 J	0.2 J	0.16 J	0.16 J	0.2 J
Cadmium	100	3.9	ND	0.22 J	0.55	0.86	0.71	0.62	1.4	1.1	1.4	0.78
Chromium	610[(1)]	23[(1)]	59.3	41 R	71 R	34 R	57 R	59 R	90 R	75 R	41 R	84 R
Cobalt	12,000	470	44.0	10	13	10	16	14	13	14	10	14
Copper	8,200	310	234.2	37 J	70 J	51 J	51 J	57 J	110 J	89 J	52 J	89 J
Lead	400[(2)]	400[(2)]	15.3	2.2	17	34	8.6	10	30	17	27	37
Mercury	NE	NE	0.12	0.01 R	0.04 R	0.03 R	0.04 R	0.1 R	0.1 R	0.07 R	0.02 R	0.06 R
Nickel	4,100	160	16.6	12	28	20	23	24	39	44	22	47
Silver	1,000	39	ND	1 U	0.38 J	1.2 U	1 U	1.1 U	1.1 U	1 U	1.1 U	1.4 U
Vanadium	1,400	55	354.5	**69**	**84**	**87**	**94**	**94**	**94**	**100**	**89**	**98**
Zinc	61,000	2,300	125.2	20 J	69 J	97 J	52 J	46 J	120 J	81 J	77 J	150 J

Notes:

[(1)] = The RBC for Chromium VI was used for screening because there is not a total Chromium RBC available.

[(2)] = Soil Screening Value USPEA 1996.

mg/kg = milligrams per kilogram.

U = Not Deteced.

J = Estimated Value.

NJ = Result is considered presumptively present at an estimated concentration.

UJ = report quantitation limit is qualified as estimated.

R = Result is rejected and unusable.

NE = Not Established.

ND = Not Detected.

ft bgs = feet below ground surface.

TABLE 5-7

SUMMARY OF INORGANIC DETECTIONS IN SURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	EPA Region III	**EPA Region III**	2 x Average	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00
Site ID	Industrial	**Residential**	Detected	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01
Sample Date	RBC	**RBC**	Background	12/14/00	12/20/00	######	12/13/00	12/14/00	12/14/00	######	12/13/00	12/15/00
Depth (ft bgs)	mg/kg	mg/kg	mg/kg	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Metals (mg/kg)												
Antimony	82	3.1	ND	2 UJ	2.4 UJ	0.6 J	2.1 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	0.79 J
Arsenic	3.8	0.43	2.6	**1.3**	**2**	**1.4**	**2.3**	**1.1** J	**1.5**	**0.6** J	**3.6**	**2**
Barium	14,000	550	181.2	45	66	38	53	66	67	52	49	75
Beryllium	410	16	1.09	0.16 J	0.17 J	0.2 J	0.17 J	0.16 J	0.18 J	0.1 J	0.16 J	0.16 J
Cadmium	100	3.9	ND	0.64	0.59 J	0.6	**4.4**	0.8	0.77	0.3 J	1.2	1.5
Chromium	610[1]	23[1]	59.3	67 R	**96** J	**98** J	98 R	74 R	75 R	81 R	51 R	**68** J
Cobalt	12,000	470	44.0	14	14	13	11	11	11	14	12	13
Copper	8,200	310	234.2	77 J	69 J	94 J	82 J	63 J	68 J	58 J	81 J	240 J
Lead	400[2]	400[2]	15.3	15	19	19	160	25	24	5.4	39	69
Mercury	NE	NE	0.12	0.06 R	0.05 J	0.1 J	0.06 R	0.03 R	0.04 R	0.1 R	0.06 R	0.04 J
Nickel	4,100	160	16.6	46	34	59	35	30	35	24	29	25
Silver	1,000	39	ND	1 U	1.2 U	0.9 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.43 J
Vanadium	1,400	55	354.5	**89**	**130**	**100**	**71**	**98**	**100**	**87**	**91**	**110**
Zinc	61,000	2,300	125.2	42 J	85 J	43 J	200 J	58 J	55 J	32 J	91 J	79 J

Notes:

[1] = The RBC for Chromium VI was used for screening because there is not a total Chromium RBC available.

[2] = Soil Screening Value USPEA 1996.

mg/kg = milligrams per kilogram.

U = Not Deteced.

J = Estimated Value.

NJ = Result is considered presumptively present at an estim concentration.

UJ = report quantitation limit is qualified as estimated.

R = Result is rejected and unusable.

NE = Not Established.

ND = Not Detected.

ft bgs = feet below ground surface.

TABLE 5-7

SUMMARY OF INORGANIC DETECTIONS IN SURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Site ID Sample Date Depth (ft bgs)	EPA Region III Industrial RBC mg/kg	**EPA Region III Residential RBC** mg/kg	2 x Average Detected Background mg/kg	Number Exceeding EPA Region III Industrial Soil RBCs	Range Exceeding EPA Region III Industrial Soil RBCs	**Number Exceeding EPA Region III Residential Soil RBCs**	**Range Exceeding EPA Region III Residential Soil RBCs**	Number Exceeding 2 x Average Detected Background	Range Exceeding 2 x Average Detected Background	Location of Maximum Detection
Metals (mg/kg)										
Antimony	82	3.1	ND	0/18		0/18		3/18	0.5J-0.70	54SB01-00
Arsenic	3.8	0.43	2.6	0/18		17/18	0.6J-3.6	3/18	2.7-3.6	54SS15
Barium	14,000	550	181.2	0/18		0/18		0/18		54SB01-00
Beryllium	410	16	1.09	0/18		0/18		0/18		54SS11
Cadmium	100	3.9	ND	0/18		1/18	4.4	18/18	0.22J-4.4	54SS12
Chromium	610[1]	23[1]	59.3	0/3		3/3	68J-98J	3/3	68J-98J	54SS11
Cobalt	12,000	470	44.0	0/18		0/18		0/18		54SS04
Copper	8,200	310	234.2	0/18		0/18		1/18	240J	54SB01-00
Lead	400[2]	400[2]	15.3	0/18		0/18		13/18	17-160	54SS12
Mercury	NE	NE	0.12	NE		NE		0/3		54SS11
Nickel	4,100	160	16.6	0/18		0/18		17/18	20-59	54SS11
Silver	1,000	39	ND	0/18		0/18		2/18	0.38J-0.43J	54SB01-00
Vanadium	1,400	55	354.5	0/18		18/18	69-130	0/18		54SS10
Zinc	61,000	2,300	125.2	0/18		0/18		2/18	150J-200J	54SS12

Notes:

[1] = The RBC for Chromium VI was used for screening because there is not a total Chromium RBC available.

[2] = Soil Screening Value USPEA 1996.

mg/kg = milligrams per kilogram.

U = Not Deteced.

J = Estimated Value.

NJ = Result is considered presumptively present at an estim concentration.

UJ = report quantitation limit is qualified as estimated.

R = Result is rejected and unusable.

NE = Not Established.

ND = Not Detected.

ft bgs = feet below ground surface.

TABLE 5-8

SUMMARY OF ORGANIC DETECTIONS IN SUBSURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID			54SB01-05	54SB01-08	54SB02-02	54SB02-06
Site ID	EPA Region III	**EPA Region III**	54TW01	54TW01	54TW02	54TW02
Sample Date	Industrial	**Residential**	12/15/00	12/15/00	12/15/00	12/15/00
Depth (ft bgs)	RBC	**RBC**	8.0-10.0	14.0-16.0	2.0-4.0	10.0-12.0
	ug/kg	ug/kg				
Volatiles (ug/kg)						
Toluene	40,880,000	1,564,000	6.6 U	2.8 J	3.6 J	2.6 J
Acetone	20,440,000	782,143	89 J	18 J	130 J	43 J
2-Butanone	122,640,000	4,692,000	33 U	34 U	6.2 J	35 U
Semivolatiles (ug/kg)						
Di-n-butylphthalate	20,440,000	782,000	430 U	57 J	440 U	460 U
Pesticides/PCBs (ug/kg)						
4,4'-DDE	16,833	1,879	4.3 U	4.5 U	1.5 J	4.6 U
4,4'-DDD	23,847	2,661	4.3 U	4.5 U	0.67 J	4.6 U
OP-Pesticides (ug/kg)						
Not Detected						
Chlorinated Herbicides (ug/kg)						
2,4,5-T	2,044,000	78,000	11 UJ	1.7 J	11 UJ	12 UJ
Dioxin/Furans (ug/kg)						
Not Detected						
TPH (mg/kg)						
Not Detected						

Notes:
ft bgs = feet below ground surface.
ug/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
U = Not Deteced.
J = Estimated Value.
UJ = Report quantitation limit is qualified as estimated.

TABLE 5-8 (continued)

SUMMARY OF ORGANIC DETECTIONS IN SUBSURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Site ID Sample Date Depth (ft bgs)	EPA Region III Industrial RBC ug/kg	**EPA Region III Residential RBC** ug/kg	Number Exceeding EPA Region III Industrial Soil RBCs	Range Exceeding EPA Region III Industrial Soil RBCs	**Number Exceeding EPA Region III Residential Soil RBCs**	**Range Exceeding EPA Region III Residential Soil RBCs**	Location of Maximum Detection
Volatiles (ug/kg)							
Toluene	40,880,000	1,564,000	0/4		0/4		54SB02-02
Acetone	20,440,000	782,143	0/4		0/4		54SB02-02
2-Butanone	122,640,000	4,692,000	0/4		0/4		54SB02-02
Semivolatiles (ug/kg)							
Di-n-butylphthalate	20,440,000	782,000	0/4		0/4		54SB01-08
Pesticides/PCBs (ug/kg)							
4,4'-DDE	16,833	1,879	0/4		0/4		54SB02-02
4,4'-DDD	23,847	2,661	0/4		0/4		54SB02-02
OP-Pesticides (ug/kg)							
Not Detected							
Chlorinated Herbicides (ug/kg)							
2,4,5-T	2,044,000	78,000	0/4		0/4		54SB01-08
Dioxin/Furans (ug/kg)							
Not Detected							
TPH (mg/kg)							
Not Detected							

Notes:
ft bgs = feet below ground surface.
ug/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.
U = Not Deteced.
J = Estimated Value.
UJ = Report quantitation limit is qualified as estimated.

TABLE 5-9

SUMMARY OF INORGANIC DETECTIONS IN SUBSURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID				54SB01-05	54SB01-08	54SB02-02	54SB02-06
Site ID	EPA Region III	**EPA Region III**	2 x Average	54TW01	54TW01	54TW02	54TW02
Sample Date	Industrial	**Residential**	Detected	12/15/00	12/15/00	12/15/00	12/15/00
Depth (ft bgs)	RBC	**RBC**	Background	8.0-10.0	14.0-16.0	2.0-4.0	10.0-12.0
	mg/kg	mg/kg	mg/kg				
Metals (mg/kg)							
Arsenic	3.8	0.43	2.6	**1.5**	**1** J	**1.3** J	1.3 U
Barium	14,000	550	181.2	44	220	120	35
Beryllium	410	16	1.1	0.75	2.4	0.63	0.23 J
Cadmium	100	3.9	0.28	1.8	0.75	0.9	0.78
Chromium	610[1]	23[1]	59.3	**100** J	6.2 J	**40** J	10 J
Cobalt	12,000	470	44.0	23	34	30	2.9
Copper	8,200	310	234.2	160 J	140 J	82 J	61 J
Lead	400[2]	400[2]	15.3	5.9	1.6	4.4	1.3
Mercury	NE	NE	0.12	0.011 J	0.0065 J	0.13 J	0.028 U
Nickel	4,100	160	16.6	12	7.6	7.6	1.7 J
Selenium	1,000	39		0.76 J	1.4 U	2.2	1.3 U
Vanadium	1,400	55	354.5	**450**	**120**	**230**	**140**
Zinc	61,000	2,300	125.2	57 J	82 J	31 J	15 J

Notes:

[1] = The RBC for Chromium VI was used for screening because there is not a total Chromium RBC available.

[2] = Soil Screening Value USPEA 1996.

mg/kg = milligrams per kilogram.

U = Not Deteced.

J = Estimated Value.

ft bgs = feet below ground surface.

NE = Not Established.

TABLE 5-9

SUMMARY OF INORGANIC DETECTIONS IN SUBSURFACE SOIL
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Site ID Sample Date Depth (ft bgs)	EPA Region III Industrial RBC mg/kg	**EPA Region III Residential RBC** mg/kg	2 x Average Detected Background mg/kg	Number Exceeding EPA Region III Industrial Soil RBCs	Range Exceeding EPA Region III Industrial Soil RBCs	**Number Exceeding EPA Region III Residential Soil RBCs**	**Range Exceeding EPA Region III Residential Soil RBCs**	Number Exceeding 2 x Average Detected Background	Range Exceeding 2 x Average Detected Background	Location of Maximum Detection
Metals (mg/kg)										
Arsenic	3.8	0.43	2.6	0/4		3/4	1J-1.5	0/4		54SB01-05
Barium	14,000	550	181.2	0/4		0/4		1/4	220	54SB01-08
Beryllium	410	16	1.1	0/4		0/4		1/4	2.4	54SB01-08
Cadmium	100	3.9	0.28	0/4		0/4		4/4	0.75-1.8	54SB01-05
Chromium	610[(1)]	23[(1)]	59.3	0/4		2/4	40J-100J	1/4	100J	54SB01-05
Cobalt	12,000	470	44.0	0/4		0/4		0/4		54SB01-08
Copper	8,200	310	234.2	0/4		0/4		0/4		54SB01-05
Lead	400[(2)]	400[(2)]	15.3	0/4		0/4		0/4		54SB01-05
Mercury	NE	NE	0.12	NE		NE		1/4	0.13J	54SB02-02
Nickel	4,100	160	16.6	0/4		0/4		0/4		54SB01-05
Selenium	1,000	39		0/4		0/4		0/4		54SB02-02
Vanadium	1,400	55	354.5	0/4		4/4	120-450	1/4	450	54SB01-05
Zinc	61,000	2,300	125.2	0/4		0/4		0/4		54SB01-08

Notes:

[(1)] = The RBC for Chromium VI was used for screening because there is not a total Chromium RBC available.

[(2)] = Soil Screening Value USPEA 1996.

mg/kg = milligrams per kilogram.

U = Not Deteced.

J = Estimated Value.

ft bgs = feet below ground surface.

NE = Not Established.

TABLE 5-10

SUMMARY OF ORGANIC DETECTIONS IN GROUNDWATER
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID		**EPA Region III**	510MW1	510MW2	510MW2D	510MW3	510MW4	510MW5	510DW1	510DW2	54TW01	54TW02
Sample Date	Federal MCL (ug/L)	**Tap Water RBC** (ug/L)	12/15/00	12/19/00	12/19/00	12/19/00	12/18/00	12/21/00	12/19/00	12/19/00	12/20/00	12/19/00
Volatiles (ug/L)												
1,1-Dichloroethene	7	0.044	5 U	5 U	5 U	5 U	5 U	**0.61** J	5 U	5 U	5 U	5 U
Chloroform	NE	0.15	5 U	5 U	5 U	**5.8**	5 U	**1.4** J	5 U	**1.2** J	5 U	5 U
Benzene	5	0.32	5 U	5 U	5 U	5 U	5 U	5 U	**91**	5 U	5 U	5 U
1,2-Dichloroethane	5	0.12	5 U	5 U	5 U	**0.86** J	5 U	5 U	5 U	**3** J	5 U	5 U
Trichloroethene	5	1.6	5 U	5 U	5 U	**5.9**	5 U	**230** D	5 U	1.1 J	5 U	5 U
Toluene	1,000	75	5 U	5 U	5 U	5 U	5 U	5 U	3.7 J	5 U	5 U	5 U
Ethylbenzene	700	130	5 U	5 U	5 U	5 U	5 U	5 U	32	5 U	5 U	5 U
Acetone	NE	61	50 U	50 U	50 U	50 U	50 U	50 U	40 J	50 U	50 U	50 U
2-Butanone	NE	190	25 U	25 U	25 U	25 U	25 U	25 U	26	25 U	25 U	25 U
Xylenes, Total	10,000	1,200	10 U	10 U	10 U	10 U	10 U	10 U	19	10 U	10 U	10 U
Isobutanol	NE	180	200 R	200 R	200 R	200 R	200 R	200 R	**2,900** J	200 R	200 R	200 R
Semivolatiles (ug/L)												
2-Methylnaphthalene	NE	12.2	10 U	10 U	10 U	10 U	10 U	10 U	0.4 J	10 U	10 U	10 U
Diethylphthalate	NE	2,900	10 U	10 U	10 U	0.52 J	10 U	10 U	0.6 J	10 U	0.68 J	10 U
4-Bromophenyl-phenyleth	NE	NE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2.2 J
Fluoranthene	NE	150	10 U	10 U	0.44 J	10 U	10 U	2.4 J	10 U	10 U	10 U	10 U
Butylbenzylphthalate	NE	730	0.77 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	NE	0.092	**0.95** J	10 U	**0.86** J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	NE	9.2	1.5 J	10 U	1.2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:

ug/L = micrograms per liter.
mg/L = milligrams per liter.
NE = Not Established.
J = Estimated value.
R = Result is rejected and unusable.
U = Not Detected.
D = Result is based on dilution analysis.

TABLE 5-10

SUMMARY OF ORGANIC DETECTIONS IN GROUNDWATER
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID		**EPA Region III**	510MW1	510MW2	510MW2D	510MW3	510MW4	510MW5	510DW1	510DW2	54TW01	54TW02
Sample Date	Federal MCL (ug/L)	**Tap Water RBC** (ug/L)	12/15/00	12/19/00	12/19/00	12/19/00	12/18/00	12/21/00	12/19/00	12/19/00	12/20/00	12/19/00
Semivolatiles (Cont.) (ug/L)												
bis(2-Ethylhexyl)phthalate	NE	4.8	10 U	10 U	10 U	10 U	10 U	10 U	3.9 J	10 U	10 U	10 U
Di-n-octylphthalate	NE	73	0.89 J	0.68 J	0.87 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	NE	0.092	**1.7** J	**0.73** J	**0.76** J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	NE	0.92	**1.5** J	1 J	**1.1** J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	0.2	0.0092	**2** J	**1** J	**1** J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	NE	0.092	**2.5** J	**1.3** J	**1.2** J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	NE	0.0092	**2.7** J	**1.2** J	**1** J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	NE	NE	2.9 J	1.6 J	1.5 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pesticides/PCBs (ug/L)												
Not Detected												
OP-Pesticides (ug/L)												
Not Detected												
Chlorinated Herbicides (ug/L)												
Not Detected												
Dioxin/Furans (ug/L)												
Not Detected												
TPH (mg/L)												
Diesel Range Organics	NE	NE	0.33	0.2	0.21	0.37	0.84	0.1 U	1.2	0.59	6.7	1.6
Gasoline Range Organics	NE	NE	0.036 J	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.84	0.05 U	0.13	0.05 U

Notes:
ug/L = micrograms per liter.
mg/L = milligrams per liter.
NE = Not Established.
J = Estimated value.
R = Result is rejected and unusable.
U = Not Detected.
D = Result is based on dilution analysis.

TABLE 5-10

SUMMARY OF ORGANIC DETECTIONS IN GROUNDWATER
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date	Federal MCL (ug/L)	**EPA Region III Tap Water RBC** (ug/L)	Number Exceeding Federal MCLs	Range Exceeding Federal MCLs	**Number Exceeding EPA Region III Tap Water RBCs**	**Range Exceeding EPA Region III Tap Water RBCs**	Location Maximum Detect
Volatiles (ug/L)							
1,1-Dichloroethene	7	0.044	0/10		1/10	0.61J	510MW5
Chloroform	NE	0.15	NE		3/10	1.2J-5.8	510MW3
Benzene	5	0.32	1/10	91	1/10	91	510DW1
1,2-Dichloroethane	5	0.12	0/10		2/10	0.86J-3J	510DW2
Trichloroethene	5	1.6	2/10	5.9-230D	2/10	5.9-230D	510MW5
Toluene	1,000	75	0/10		0/10		510DW1
Ethylbenzene	700	130	0/10		0/10		510DW1
Acetone	NE	61	NE		0/10		510DW1
2-Butanone	NE	190	NE		0/10		510DW1
Xylenes, Total	10,000	1,200	0/10		0/10		510DW1
Isobutanol	NE	180	NE		1/10	2,900J	510DW1
Semivolatiles (ug/L)							
2-Methylnaphthalene	NE	12.2	NE		0/10		510DW1
Diethylphthalate	NE	2,900	NE		0/10		54TW01
4-Bromophenyl-phenyleth	NE	NE	NE		NE		54TW02
Fluoranthene	NE	150	NE		0/10		510MW5
Butylbenzylphthalate	NE	730	NE		0/10		510MW1
Benzo(a)anthracene	NE	0.092	NE		2/10	0.86J-0.95J	510MW1
Chrysene	NE	9.2	NE		0/10		510MW1

Notes:
ug/L = micrograms per liter.
mg/L = milligrams per liter.
NE = Not Established.
J = Estimated value.
R = Result is rejected and unusable.
U = Not Detected.
D = Result is based on dilution analysis.

TABLE 5-10

SUMMARY OF ORGANIC DETECTIONS IN GROUNDWATER
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date	Federal MCL (ug/L)	**EPA Region III Tap Water RBC** (ug/L)	Number Exceeding Federal MCLs	Range Exceeding Federal MCLs	**Number Exceeding EPA Region III Tap Water RBCs**	**Range Exceeding EPA Region III Tap Water RBCs**	Location Maximum Detect
Semivolatiles (Cont.) (ug/L)							
bis(2-Ethylhexyl)phthalate	NE	4.8	NE		0/10		510MW1
Di-n-octylphthalate	NE	73	NE		0/10		510DW1
Benzo(b)fluoranthene	NE	0.092	NE		3/10	0.73J-1.7J	510MW1
Benzo(k)fluoranthene	NE	0.92	NE		3/10	1J-1.5J	510MW1
Benzo(a)pyrene	0.2	0.0092	3/10	1J-2J	3/10	1J-2J	510MW1
Indeno(1,2,3-cd)pyrene	NE	0.092	NE		3/10	1.2J-2.5J	510MW1
Dibenzo(a,h)anthracene	NE	0.0092	NE		3/10	1J-2.7J	510MW1
Benzo(g,h,i)perylene	NE	NE	NE		NE		510MW1
Pesticides/PCBs (ug/L)							
Not Detected							
OP-Pesticides (ug/L)							
Not Detected							
Chlorinated Herbicides (ug/L)							
Not Detected							
Dioxin/Furans (ug/L)							
Not Detected							
TPH (mg/L)							
Diesel Range Organics	NE	NE	NE		NE		54TW01
Gasoline Range Organics	NE	NE	NE		NE		510DW1

Notes:
ug/L = micrograms per liter.
mg/L = milligrams per liter.
NE = Not Established.
J = Estimated value.
R = Result is rejected and unusable.
U = Not Detected.
D = Result is based on dilution analysis.

TABLE 5-11

SUMMARY OF (TOTAL) INORGANIC DETECTIONS IN GROUNDWATER
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date	Federal MCL (mg/L)	**EPA Region III Tap Water RBC** (mg/L)	2 x Average Detected Background (mg/L)	510MW1 12/15/00	510MW2 12/19/00	510MW2D 12/19/00	510MW3 12/18/00	510MW4 12/18/00	510MW5 12/21/00	510DW1 12/18/00	510DW2 12/18/00	54TW01 12/20/00	54TW02 12/19/00
Metals (mg/L)													
Arsenic	0.05	0.000045	0.036	0.01 U	0.01 U	0.01 U	0.01 U	**0.0044** J	**0.0095** J	0.01 U	0.01 U	**0.006** J	**0.0046** J
Barium	2	0.26	0.706	0.22	**0.28**	0.17	0.14	0.16	0.22	**0.35**	0.04	**1.5**	**0.82**
Beryllium	0.004	0.0073	0.003	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	**0.014**	0.0019 J
Cadmium	0.005	0.0018	0.006	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.0017 J	**0.0029** J
Chromium	0.1	0.011[1]	0.117	0.0061 J	0.011	0.0087 J	0.0094 J	0.0074 J	0.01	0.01 U	0.01 U	**0.026**	**0.066**
Cobalt	NE	0.22	0.142	0.0034 J	0.017	0.0092 J	0.0046 J	0.0059 J	0.019	0.0063 J	0.01 U	**0.31**	0.025
Copper	1.3[2]	0.15	0.299	0.011 J	0.025	0.011 J	0.0098 J	0.027	0.048	0.0084 J	0.02 U	**0.61**	**0.52**
Lead	0.015[3]	NE	0.007	0.005 U	0.0017 J	0.005 U	0.005 U	0.0023 J	0.0089	0.005 U	0.005 U	0.0042 J	0.015
Mercury	0.002	NE	ND	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0001 J	0.0002 UJ	0.0002 UJ
Nickel	NE	0.073	0.090	0.04 U	0.013 J	0.0083 J	0.04 U	0.04 U	0.0074 J	0.04 U	0.04 U	0.036 J	0.017 J
Thallium	0.002	0.00026	ND	0.01 U	**0.0054** J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Tin	NE	2.2	ND	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0083 J	0.017 J
Vanadium	NE	0.026	0.419	0.015	0.11	0.059	0.019	0.062	0.068	0.0084 J	0.028	0.41	0.82
Zinc	NE	1.1	0.361	0.0061 J	0.045	0.022	0.031	0.027	0.29	0.13	0.02 U	0.72	0.16

Notes:

[1] The RBC for Chromium VI was used for screening because there is not a total Chromium RBC available.

[2] EPA Action Level for Copper.

[3] EPA Action Level for Lead.

mg/L = milligrams per liter.

U = Not Detected.

UJ = Report quantitation limit is qualified as estimated.

J = Estimated Value.

ND = Not Detected.

TABLE 5-11 (continued)

SUMMARY OF (TOTAL) INORGANIC DETECTIONS IN GROUNDWATER
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date	Federal MCL (mg/L)	**EPA Region III Tap Water RBC** (mg/L)	2 x Average Detected Background (mg/L)	Number Exceeding Federal MCLs	Range Exceeding Federal MCLs	**Number Exceeding EPA Region III Tap Water RBCs**	**Range Exceeding EPA Region III Tap Water RBCs**	Number Exceeding 2 x Average Detected Background	Range Exceeding 2 x Average Detected Background	Location Maximum Detect
Metals (mg/L)										
Arsenic	0.05	0.000045	0.036	0/10		4/10	0.0044J-0.0095	0/10		510MW5
Barium	2	0.26	0.706	0/10		4/10	0.28-1.5	1/10	1.5	54TW01
Beryllium	0.004	0.0073	0.003	1/10	0.014	1/10	0.014	0/10		54TW01
Cadmium	0.005	0.0018	0.006	0/10		1/10	0.0029J	0/10		54TW02
Chromium	0.1	0.011[(1)]	0.117	0/10		2/10	0.026-0.066	0/10		54TW02
Cobalt	NE	0.22	0.142	NE		1/10	0.31	1/10	0.31	54TW01
Copper	1.3[(2)]	0.15	0.299	0/10		2/10	0.52-0.61	2/10	0.52-0.61	54TW01
Lead	0.015[(3)]	NE	0.007	0/10		NE		1/10	0.0089	54TW02
Mercury	0.002	NE	ND	0/10		NE		1/10	0.0001J	510DW2
Nickel	NE	0.073	0.090	NE		0/10		0/10		54TW01
Thallium	0.002	0.00026	ND	1/10	0.0054J	1/10	0.0054J	1/10	0.0054J	510MW2
Tin	NE	2.2	ND	NE		0/10		2/10	0.017J-0.0083	54TW02
Vanadium	NE	0.026	0.419	NE		7/10	0.028-0.82	1/10	0.82	54TW02
Zinc	NE	1.1	0.361	NE		0/10		1/10	0.72	54TW01

Notes:

(1) The RBC for Chromium VI was used for screenir
because there is not a total Chromium RBC availa

(2) EPA Action Level for Copper.

(3) EPA Action Level for Lead.

mg/L = milligrams per liter.

U = Not Detected.

UJ = Report quantitation limit is qualified as estima

J = Estimated Value.

ND = Not Detected.

TABLE 5-12

SUMMARY OF ORGANIC DETECTIONS IN GROUNDWATER - WATER QUALITY
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date	Federal MCL (mg/L)	**Secondary MCL** (mg/L)	EPA Region III Tap Water RBC (mg/L)	510MW1 12/20/00	510MW2 12/20/00
Groundwater Quality					
Chloride (mg/L)	NE	250	NE	27	140
Color (PCU)	NE	15	NE	5	5
Fluoride (mg/L)	NE	2	NE	0.47	0.45
Corrosivity(L)	NE	NE	NE	1.6	1.3
Odor (TON)	NE	3	NE	2	1
Sulfate as SO4 (mg/L)	NE	250	NE	19	70
Total Dissolved Solids (mg/l	NE	500	NE	**520**	**990**
Aluminum (mg/L)	NE	0.05	3.7	**2.7**	**34**
Iron (mg/L)	NE	0.3	1.1	**3.7**	**37**
Manganese (mg/L)	NE	0.05	0.51	**0.24** J	**0.99** J
Hardness as CaCO3 (mg/L)	NE	NE	NE	410	230
Copper (mg/L)	1.3 (1)	1	0.15	0.011 B	0.025
Zinc (mg/L)	NE	5	1.1	0.006 B	0.045

Notes:

(1) = EPA Action Level for Copper.
mg/L = milligrams per liter.
L = Langlier Index.
PCU = primary color units.
TON = threshold odor number.
NE = Not Established.
J = Estimated value.
B = Reported value was obtained from a reading that was less than the Project Reporting Limits but greater than or equal to the Method Detection Limit.

TABLE 5-12

SUMMARY OF ORGANIC DETECTIONS IN GROUNDWATER - WATER QUALITY
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date	Federal MCL (mg/L)	**Secondary MCL** (mg/L)	EPA Region III Tap Water RBC (mg/L)	Number Exceeding Federal MCLs	Range Exceeding Federal MCLs	**Number Exceeding Secondary MCLs**	**Range Exceeding Secondary MCLs**	Number Exceeding EPA Region III Tap Water RBCs	Range Exceeding EPA Region III Tap Water RBCs	Location Maximum Detect
Groundwater Quality										
Chloride (mg/L)	NE	250	NE	NE		0/2		NE		510MW2
Color (PCU)	NE	15	NE	NE		0/2		NE		510MW1, 510MW2
Fluoride (mg/L)	NE	2	NE	NE		0/2		NE		510MW1
Corrosivity(L)	NE	NE	NE	NE		NE		NE		510MW1
Odor (TON)	NE	3	NE	NE		0/2		NE		510MW1
Sulfate as SO4 (mg/L)	NE	250	NE	NE		0/2		NE		510MW2
Total Dissolved Solids (mg/l	NE	500	NE	NE		2/2	520-990	NE		510MW2
Aluminum (mg/L)	NE	0.05	3.7	NE		2/2	2.7-34	1/2	34	510MW2
Iron (mg/L)	NE	0.3	1.1	NE		2/2	3.7-37	2/2	3.7-37	510MW2
Manganese (mg/L)	NE	0.05	0.51	NE		2/2	0.24J-0.99J	1/2	0.99J	510MW2
Hardness as CaCO3 (mg/L)	NE	NE	NE	NE		NE		NE		510MW1
Copper (mg/L)	1.3 (1)	1	0.15	0/2		0/2		0/2		510MW2
Zinc (mg/L)	NE	5	1.1	NE		0/2		0/2		510MW2

Notes:

(1) = EPA Action Level for Copper.
mg/L = milligrams per liter.
L = Langlier Index.
PCU = primary color units.
TON = threshold odor number.
NE = Not Established.
J = Estimated value.
B = Reported value was obtained from a reading that was less than
Project Reporting Limits but greater than or equal to the Metho
Detection Limit.

TABLE 5-13

SUMMARY OF ORGANIC DETECTIONS IN STANDING WATER
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

	EPA Region III				
Sample ID	Federal	**Tap Water**	54SW01	54SW01D	54SW02
Sample Date	MCL	**RBC**	12/16/00	12/16/00	12/16/00
	(ug/L)	(ug/L)			
Volatiles (ug/L)					
Not Detected					
Semivolatiles (ug/L)					
Phenanthrene	NE	18.25	10 U	0.62 J	10 U
Anthracene	NE	182.5	10 U	0.54 J	10 U
Fluoranthene	NE	150	10 U	1.4 J	0.63 J
Pyrene	NE	18.25	10 U	1.2 J	10 U
Butylbenzylphthalate	NE	730	0.57 J	1.7 J	1.2 J
Benzo(a)anthracene	NE	0.09	10 U	**1.8** J	**1.1** J
Chrysene	NE	9.17	0.66 J	2.8 J	1.3 J
bis(2-Ethylhexyl)phthalate	NE	4.78	1.3 J	10 U	1.7 J
Di-n-octylphthalate	NE	73	0.7 J	1.7 J	1.3 J
Benzo(b)fluoranthene	NE	0.09	**0.82** J	**3.2** J	**1.3** J
Benzo(k)fluoranthene	NE	0.92	10 U	**2.4** J	**1.3** J
Benzo(a)pyrene	0.2	0.0092	**0.9** J	**3.2** J	**1.4** J
Indeno(1,2,3-cd)pyrene	NE	0.092	**1.1** J	**2.5** J	**1.3** J
Dibenzo(a,h)anthracene	NE	0.0092	**1.3** J	**3.4** J	**1.4** J
Benzo(g,h,i)perylene	NE	NE	1.4 J	3.8 J	1.8 J
Pesticides/PCBs (ug/L)					
Not Detected					
OP-Pesticides (ug/L)					
Not Detected					
Chlorinated Herbicides (ug/L)					
Not Detected					
Dioxin/Furans (ug/L)					
Not Detected					
TPH (mg/L)					
Diesel Range Organics	NE	NE	0.1 U	0.1 U	0.2

Notes:
ug/L = micrograms per liter.
mg/L = milligrams per liter.
NE = Not Established.
J = Estimated value.
U = Not Detected.

TABLE 5-13 (continued)

SUMMARY OF ORGANIC DETECTIONS IN STANDING WATER
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date	Federal MCL (ug/L)	**EPA Region III Tap Water RBC** (ug/L)	Number Exceeding Federal MCLs	Range Exceeding Federal MCLs	**Number Exceeding EPA Region III Tap Water RBCs**	**Range Exceeding EPA Region III Tap Water RBCs**	Location Maximum Detect
Volatiles (ug/L)							
Not Detected							
Semivolatiles (ug/L)							
Phenanthrene	NE	18.25	NE		0/3		54SW01D
Anthracene	NE	182.5	NE		0/3		54SW01D
Fluoranthene	NE	150	NE		0/3		54SW01D
Pyrene	NE	18.25	NE		0/3		54SW01D
Butylbenzylphthalate	NE	730	NE		0/3		54SW01D
Benzo(a)anthracene	NE	0.09	NE		2/3	1.1J-1.8J	54SW01D
Chrysene	NE	9.17	NE		0/3		54SW01D
bis(2-Ethylhexyl)phthalate	NE	4.78	NE		0/3		54SW02
Di-n-octylphthalate	NE	73	NE		0/3		54SW01D
Benzo(b)fluoranthene	NE	0.09	NE		3/3	0.82J-3.2J	54SW01D
Benzo(k)fluoranthene	NE	0.92	NE		2/3	1.3J-2.4J	54SW01D
Benzo(a)pyrene	0.2	0.0092	3/3	0.9J-3.2J	3/3	0.9J-3.2J	54SW01D
Indeno(1,2,3-cd)pyrene	NE	0.092	NE		3/3	1.1J-2.5J	54SW01D
Dibenzo(a,h)anthracene	NE	0.0092	NE		3/3	1.3J-3.4J	54SW01D
Benzo(g,h,i)perylene	NE	NE	NE		NE		54SW01D
Pesticides/PCBs (ug/L)							
Not Detected							
OP-Pesticides (ug/L)							
Not Detected							
Chlorinated Herbicides (ug/L)							
Not Detected							
Dioxin/Furans (ug/L)							
Not Detected							
TPH (mg/L)							
Diesel Range Organics	NE	NE	NE		NE		54SW02

Notes:
ug/L = micrograms per liter.
mg/L = milligrams per liter.
NE = Not Established.
J = Estimated value.
U = Not Detected.

TABLE 5-14

SUMMARY OF (TOTAL) INORGANIC DETECTIONS IN STANDING WATER
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID Sample Date	Federal MCL (mg/L)	**EPA Region III Tap Water RBC** (mg/L)	54SW01 12/16/00	54SW01D 12/16/00	54SW02 12/16/00	Number Exceeding Federal MCLs	Range Exceeding Federal MCLs	**Number Exceeding EPA Region III Tap Water RBCs**	**Range Exceeding EPA Region III Tap Water RBCs**	Location Maximum Detect
Metals (mg/L)										
Barium	2	0.26	0.02	0.019	0.019	0/3		0/3		54SW01
Copper	1.3[(1)]	0.15	0.0037 J	0.0044 J	0.005 J	0/3		0/3		54SW02
Vanadium	NE	0.026	0.0036 J	0.0032 J	0.004 J	NE		0/3		54SW02

Notes:
(1) = EPA Action Level for Copper.
mg/L = milligrams per liter.
J = Estimated value.
NE = Not Established.

TABLE 5-15

SUMMARY OF INORGANIC DETECTIONS IN EQUIPMENT RINSATE SAMPLES
SWMU 53- BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	53ER01	53ER02
Sample Date	12/14/00	12/14/00
Metals (mg/L		
Chromium	0.01 U	0.012
Nickel	0.04 U	0.0061 J

Notes:
mg/L = milligrams per liter.
U = Not detected.
J = Estimated value.

TABLE 5-16

SUMMARY OF ORGANIC DETECTIONS IN EQUIPMENT RINSATE SAMPLES
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54ER01	54ER02	54ER03
Sample Date	12/19/00	12/21/00	12/19/00
Volatiles (ug/L)			
Not Detected			
Semivolatiles (ug/L)			
Di-n-butylphthalate	10 U	0.84 J	10 U
bis(2-Ethylhexyl)phthalate	10 U	0.72 J	10 U
Benzo(g,h,i)perylene	1.6 J	10 UJ	10 U
Pesticides/PCBs (ug/L)			
Not Detected			
OP-Pest (ug/L)			
Not Detected			
Chlorinated Herbicides (ug/L			
Not Detected			
Dioxin/Furans (ug/L)			
Not Detected			
TPH (mg/L)			
Not Detected			

Notes:
ug/L = micrograms per liter.
mg/L = milligrams per liter.
J = Estimated value.
U = Not Detected.
UJ = Report quantitation limit is qualified as estimated.

TABLE 5-17

SUMMARY OF INORGANIC DETECTIONS IN EQUIPMENT RINSATE SAMPLES
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54ER01	54ER02	54ER03
Sample Date	12/19/00	12/21/00	12/19/00
Metals (mg/L			
Arsenic	0.01 U	0.0053 J	0.01 U

Notes:
mg/L = milligrams per liter.
J = Estimated value.
U = Not Detected.

TABLE 5-18

SUMMARY OF ORGANIC DETECTIONS IN FIELD BLANK SAMPLES
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	2000FB01	2000FB02	2000FB03
Sample Date	12/20/00	12/21/00	12/20/00
Volatiles (ug/L)			
Chloroform	5 U	5 U	140
Bromodichloromethane	5 U	5 U	14
Dibromochloromethane	5 U	5 U	1.4 J
Semivolatiles (ug/L)			
1,4-Dichlorobenzene	10 U	12	10 U
Benzo(b)fluoranthene	10 U	10 U	0.81 J
Benzo(k)fluoranthene	10 U	10 U	1.5 J
Benzo(a)pyrene	10 U	10 U	1.2 J
Indeno(1,2,3-cd)pyrene	10 U	10 U	2 J
Dibenzo(a,h)anthracene	10 U	10 U	1.4 J
Benzo(g,h,i)perylene	10 U	10 U	1.7 J
Pesticides/PCBs (ug/L)			
Not Detected			
OP-Pest (ug/L)			
Not Detected			
Chlorinated Herbicides (ug/L)			
Not Detected			
Dioxin/Furans (ug/L)			
Not Detected			
TPH (mg/L)			
Diesel Range Organics	0.1 U	0.096 J	0.1 U

Notes:
ug/L = micrograms per liter.
mg/L = milligrams per liter.
U = Not detected.
J = Estimated value.

TABLE 5-19

SUMMARY OF INORGANIC DETECTIONS IN FIELD BLANK SAMPLES
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	2000FB01	2000FB02	2000FB03
Sample Date	12/20/00	12/21/00	12/20/00
Metals (mg/L			
Barium	0.01 U	0.01 U	0.0046 J
Chromium	0.01 U	0.014	0.01 U
Copper	0.02 U	0.02 U	0.03
Lead	0.0021 J	0.005 U	0.011
Selenium	0.01 U	0.01 U	0.0052 J
Zinc	0.02 U	0.0068 J	0.026

Notes:
mg/L = milligrams per liter.
U = Not detected.
J = Estimated value.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The following subsections provide the conclusions and recommendations for this Sampling and Analysis Report for SWMUs 53 and 54, as determined from the findings of investigations discussed in previous sections.

6.1 Conclusions

This section of the report provides overall conclusions regarding SWMU 53 and 54 based on results of the field investigation. Recommendations are provided in response to the conclusions.

6.1.1 SWMU 53

A review of the analytical data indicates that it is likely there was a release of contaminants to the surface soils in the vicinity of the malaria control building. It is known that 4,4'-DDT was stored inside the building, and it has been detected in all but one of the surface soil samples around Building 64. Only one of the detections was in excess of the residential RBC. The highest detections were isolated to the downgradient side of the site. 4,4-DDT was the only pesticide detected in the subsurface soils and was detected in only two of the seven samples. These detections were below the screening criteria. Both of these samples were also collected on the downgradient side of the site. 4,4'-DDT adsorbs very strongly to soil and is subject to evaporation and photodegradation at the surface of soils. It will not leach appreciably to groundwater or hydrolyze (Spectrum Laboratories, 2001). Lead and arsenic were detected above their respective screening criteria in several of the surface soil samples collected. The maximum concentrations of lead and arsenic were primarily detected on the eastern and western sides of Building 64. Arsenic was also detected above the residential RBC in the subsurface soil. Bedrock underlies the entire site at depths ranging from 4.5 to 10 feet below ground surface with groundwater below the subsurface soils (see Section 3.3.3). Groundwater was not encountered during the investigation due to split-spoon refusal at the subsurface soils bedrock interface. As such groundwater underlying SWMU 53 is not in contact with the soils at the site. The results from this investigation indicate the presence of pesticides, as well as arsenic and lead in surface soils in the vicinity of Building 64. Also, wipe samples taken from the inside of Building 64 show pesticides were also detected on the floor of the unoccupied building, a direct result of prior use of the building for storing/mixing pesticides.

6.1.2 SWMU 54

Results from analytical data associated with soil at SWMU 54 show there were minor detections of various constituents in the surface and subsurface soil samples, with the majority of them below any of the RBCs. Only one surface soil sample had an exceedance of the residential RBC for organics, this constituent was benzo(a)pyrene from a sample outside the fenced area of site operations. The detections of inorganic constituents in the surface soil were below the industrial RBCs in all sixteen samples. However, arsenic, cadmium and vanadium had exceedances of residential RBCs in all samples, except in sample 54SS01 for arsenic. Background screening levels were exceeded in all 16 of the cadmium samples, 13 out of 16 of the lead samples and in 15 out of 16 of the nickel samples in the surface soil.

Of the four subsurface samples collected none of the samples exceeded inorganic industrial RBCs. However, arsenic exceeded residential RBCs in 3 out of 4 samples, chromium in 2 out of 4 and vanadium in all four samples. Arsenic was below the background screening for all samples, while chromium and vanadium were below background levels in 3 our of 4 samples each.

The results from the groundwater portion of the investigation indicate that there has been a release of TCE in the vicinity of SWMU 54. The source of the TCE contamination is unclear at this time, however, it will be evaluated during the RFI stage. The other groundwater contaminants observed during this investigation are believed to be related to the former UST associated with Building 510. However, results comparing the data collected during this report compared to 1995 data indicate natural attenuation of the groundwater is occurring, decreasing the concentration of petroleum related contaminants. None of the inorganics detected in the standing water were in excess of the screening criteria.

Low levels of PAHs (at estimated concentrations less than the analytical method detection limit) were detected in soil, groundwater, and in standing water from SWMU 54 as discussed in Section 5.3. This data is considered more likely to represent anthropogenic background than site-related contamination. It is likely that the PAHs in the standing water are from low level concentrations of PAHs that have adsorbed to suspended sediments in the water.

6.2 Recommendations

The following provides recommendations for SWMUs 53 and 54.

6.2.1 SWMU 53

It is recommended that a RCRA Facility Investigation be conducted at this SWMU to delineate the 4,4'-DDT, lead, and arsenic contamination in the surface and subsurface soils.

6.2.2 SWMU 54

It is recommended that the standing water is removed from the open excavation at the site and be properly disposed of followed by backfilling the excavations. It is also recommended that a RCRA Facility Investigation be conducted at this SWMU to further investigate the presence of TCE in groundwater. The results presented in the BB&L report (BB&L, 1995) and this report indicate that natural biodegradation is effectively remediating the contaminants associated with Site 510. Therefore, further investigations related to those particular contaminants are not warranted at this time.

7.0 REFERENCES

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APPENDIX A
Test Boring and Well Construction Records

APPENDIX A.1
Test Boring Records – SWMU 53

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: SMWU 54 - Sampling and Analysis Report

PROJ. NO.: CTO-099 BORING NO.: 53-SB01

COORDINATES: EAST: 781405.227 NORTH: 148544.425

ELEVATION: SURFACE: 118.62

Rig: Mobile B-61	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1-3/8-in	--	4-1/4-in	--	12/14/00	0.0 - 8.5	M Sunny, low 80s	--
Length	2-ft	--	5-ft	--				
Type	Stainless	--	HSA	--				
Hammer Wt.	140	--	--	--				
Fall	30-in	--	--	--				

Remarks: Sample ID = 53-SB01-__ (with suffix shown below)

SAMPLE TYPE

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

DEFINITIONS

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

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description		Elevation (Ft. MSL)
1		S-1	0.8	7 6		0	SILT, little clay & fine gravel; brown; moist; stiff	1.0	117.62
			40%	6		0	Weathered BEDROCK; mottled gray;		
2	2.0			7			stiff; damp		
3		S-2	0.9	6 7		0	tan		
			45%	9		0			
4	4.0			16					
5		S-3	1.4	20 21	03	0	tan		
			70%	22		0			
6	6.0			32					
7		S-4	1.5	30 40		0	orangish-tan (mottled) w/ vertical fractures		
			75%	45		0	filled w/ black clay; hard; damp		
8	8.0			53/3"					
9		S-5	1.3	55 45	05	0	orangish-brown & gray		
			65%	45		0			
10	10.0			55/5"				10.0	108.62
							BOH at 10-ft bgs (Spoon refusal)		

DRILLING COMPANY: Geoworks, Inc. BAKER REP.: Mark DeJohn

DRILLER: Daniel Rolon BORING NO.: 53-SB01 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: SMWU 54 - Sampling and Analysis Report

PROJ. NO.: CTO-099 BORING NO.: 53-SB02

COORDINATES: EAST: 781447.577 NORTH: 148534.321

ELEVATION: SURFACE: 121.43

Rig: Mobile B-61	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1-3/8-in	--	4-1/4-in	--	12/14/00	0.0 - 4.6	M Sunny, mid 70s	--
Length	2-ft	--	5-ft	--				
Type	Stainless	--	HSA	--				
Hammer Wt.	140	--	--	--				
Fall	30-in	--	--	--				

Remarks: Sample ID = 53-SB02-__ (with suffix shown below)

SAMPLE TYPE

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

DEFINITIONS

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

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description		Elevation (Ft. MSL)
1		S-1	0.5 25%	3 4 4 16		0 0	ROCK FRAG; some silt & clay; dk brown; stiff; moist		
2	2.0							1.9	119.53
3		S-2	0.6 36%	20 50 50 54/3"	02	0 0	Weathered BEDROCK; med brown; hard; dry		.
4	4.0								
	4.6	S-3	0.3	50-60/2"		0/0		4.6	116.83
5							BOH at 4.6-ft bgs (Spoon refusal)		
6									
7									
8									
9									
10									

DRILLING COMPANY: Geoworks, Inc. BAKER REP.: Mark DeJohn

DRILLER: Daniel Rolon BORING NO.: 53-SB02 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: SMWU 54 - Sampling and Analysis Report

PROJ. NO.: CTO-099 BORING NO.: 53-SB03

COORDINATES: EAST: 781466.304 NORTH: 148520.4549

ELEVATION: SURFACE: 123.29

Rig: Mobile B-61	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1-3/8-in	--	4-1/4-in	--	12/14/00	0.0 - 4.5	M Sunny, mid 70s	--
Length	2-ft	--	5-ft	--				
Type	Stainless	--	HSA	--				
Hammer Wt.	140	--	--	--				
Fall	30-in	--	--	--				

Remarks: Sample ID = 53-SB03-__ (with suffix shown below)

SAMPLE TYPE

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

DEFINITIONS

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

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description		Elevation (Ft. MSL)
1		S-1	1.1	5 7	01	0	ROCK FRAG & SILT; some clay; brown & gray; moist; very stiff	1.0	122.29
			55%	14		0	Weathered BEDROCK; orangish-brown &		
2	2.0			23			greenish-gray; hard; damp		
3		S-2	0.8	22 47		0			
			48%	49		0			
4	4.0			56/3"					
	4.5	S-3	0.0	64/5"		--	No Recovery	4.5	118.79
5							BOH at 4.5-ft bgs (Spoon refusal)		
6									
7									
8									
9									
10									

DRILLING COMPANY: Geoworks, Inc. BAKER REP.: Mark DeJohn

DRILLER: Daniel Rolon BORING NO.: 53-SB03 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: SMWU 54 - Sampling and Analysis Report

PROJ. NO.: CTO-099 BORING NO.: 53-SB04

COORDINATES: EAST: 781442.599 NORTH: 148506.6674

ELEVATION: SURFACE: 122.86

Rig: Mobile B-61	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1-3/8-in	--	4-1/4-in	--	12/14/00	0.0 - 6.0	M Sunny, mid 70s	--
Length	2-ft	--	5-ft	--				
Type	Stainless	--	HSA	--				
Hammer Wt.	140	--	--	--				
Fall	30-in	--	--	--				

Remarks: Sample ID = 53-SB04-__ (with suffix shown below)

SAMPLE TYPE

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

DEFINITIONS

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

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description		Elevation (Ft. MSL)
1		S-1	1.0	7 14		0	ROCK FRAG, some silt; trace clay; hard; dry		
			50%	27		0			
2	2.0			9					
				17				3.0	119.86
3		S-2	0.9	14	02	0	Weathered BEDROCK; greenish-gray, gray and tan - mottled; hard; damp		
			45%	17		0			
4	4.0			35					
				31					
5		S-3	0.9	37		0	mottled brown and gray		
	5.5		60%	50/4"		0			
6	6.0	S-4	0.4	62/5"		0/0	mottled dk brown	6.0	116.86
7							BOH at 6-ft bgs (Spoon refusal)		
8									
9									
10									

DRILLING COMPANY: Geoworks, Inc. BAKER REP.: Mark DeJohn

DRILLER: Daniel Rolon BORING NO.: 53-SB04 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: SMWU 54 - Sampling and Analysis Report

PROJ. NO.: CTO-099 BORING NO.: 53-SB05

COORDINATES: EAST: 781434.016 NORTH: 148520.6589

ELEVATION: SURFACE: 121.00

Rig: Mobile B-61	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1-3/8-in	--	4-1/4-in	--	12/13/00	0.0 - 6.33	M Sunny, low 80s	--
Length	2-ft	--	5-ft	--				
Type	Stainless	--	HSA	--				
Hammer Wt.	140	--	--	--				
Fall	30-in	--	--	--				

Remarks: Sample ID = 53-SB05-__ (with suffix shown below)

SAMPLE TYPE

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

DEFINITIONS

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

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description		Elevation (Ft. MSL)
1		S-1	0.9 45%	10 10 10 17	00	0 0	ROCK FRAG, some silt, trace brick frag; gray; stiff; dry		
2	2.0							2.0	119.00
3		S-2	1 50%	9 10 12 14	02	0 0	Weathered BEDROCK; brown; very stiff; dry		.
4	4.0								
5	5.5	S-3	0.4 20%	8 15 55/5"		0 0	greenish-gray; hard; damp		
6	6.0	A-N	--	--		--			
	6.3	S-4		32-54/4"				6.3	114.70
7							BOH at 6.33-ft bgs (spoon refusal)		
8									
9									
10									

DRILLING COMPANY: Geoworks, Inc. BAKER REP.: Mark DeJohn

DRILLER: Daniel Rolon BORING NO.: 53-SB05 SHEET 1 OF 1

Baker

Baker Environmental

TEST BORING RECORD

PROJECT: SMWU 54 - Sampling and Analysis Report

PROJ. NO.: CTO-099 BORING NO.: 53-SB06

COORDINATES: EAST: 781424.190 NORTH: 148518.0624

ELEVATION: SURFACE: 120.98

Rig: Mobile B-61	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	1-3/8-in	--	4-1/4-in	--	12/13/00	0.0 - 8.5	M Sunny, low 80s	--
Length	2-ft	--	5-ft	--				
Type	Stainless	--	HSA	--				
Hammer Wt.	140	--	--	--				
Fall	30-in	--	--	--				

Remarks: Sample ID = 53-SB06-__ (with suffix shown below)

SAMPLE TYPE

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

DEFINITIONS

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

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description		Elevation (Ft. MSL)
1		S-1	1.0 50%	11 15 17 19		0 0	ROCK FRAG, some silt; gray; dense; dry		
2	2.0							2.0	118.98
3		S-2	0.4 20%	17 13 13 17		0 0	Weathered BEDROCK; mottled red-brown, and gray; very stiff; damp		.
4	4.0								
5		S-3	0.7 35%	14 14 15 17	03	0 0	brown and greenish-gray		
6	6.0								
7		S-4	1.5 75%	23 23 27 31		0 0	hard		
8	8.0								
9	9.0	S-5	0.9 90%	47 50/5"		0 0		9.0	111.98
10							BOH at 9-ft bgs (Spoon refusal)		

DRILLING COMPANY: Geoworks, Inc. BAKER REP.: Mark DeJohn

DRILLER: Daniel Rolon BORING NO.: 53-SB06 SHEET 1 OF 1

APPENDIX A.2
Test Boring and Well Construction Records – SWMU 54

Baker

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	SMWU 54 - Sampling and Analysis Report		
PROJ. NO.:	CTO-099	BORING NO.:	54-TW01
COORDINATES:	EAST: 761672.759	NORTH:	139311.8611
ELEVATION:	SURFACE: 117.5	TOP OF PVC CASING:	118.13

Rig: Mobile B-61

	Split Spoon	Casing	Augers	Core Barrel	Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Size (ID)	2-3/8-in	--	4-1/4-in	--	12/15/00	0.0 - 20.0	M sunny, mid 80s	15.5
Length	2-ft	--	5-ft	--				
Type	Stainless	--	HSA	--				
Hammer Wt.	140	--	--	--				
Fall	30-in	--	--	--				

Remarks: Sample ID = 54-SB01-__ (with suffix shown below)
Surface elevation is an average elevation of nearby surface soil samples

SAMPLE TYPE

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

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch 40 PVC Casing	2-in	0	10
Sch 40 PVC 10-Slot Screen	2-in	10	20

Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1 / 2.0	S-1	1.9 / 95%	20 31 32 19	00	0 / 0	SILT, some f/c gravel, trace clay; black & dk brown; v dense; damp (FILL) 2.0		115.50
3 / 4.0	S-2	1.5 / 75%	13 13 21 21		0 / 0	CLAY, little silt, trace c sand; dk yellowish-brown; hard; damp (NATIVE)		
5 / 6.0	S-3	1.6 / 80%	18 25 31 33		0 / 0	little silt; mottled-reddish-brown & gray		
7 / 8.0	S-4	1.9 / 95%	33 29 48 47		0 / 0	SILT, some clay, trace f gravel; mottled rust & yellowish-brown; hard; damp		
9 / 10.0	S-5	1.7 / 85%	5 9 13 15		0 / 0	CLAY, little silt, trace f gravel; mottled yellow, brown, rust & gray v stiff; damp 10.0		117.50
			5			Match to Sheet 2		

DRILLING CO.:	Geoworks, Inc.	BAKER REP.:	Mark DeJohn
DRILLER:	Daniel Rolon	BORING NO.:	54-TW01 SHEET 1 OF 2

Baker

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: SMWU 54 - Sampling and Analysis Report

CTO NO.: CTO-099 BORING NO.: 54-TW01

SAMPLE TYPE

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

DEFINITIONS

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

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail			Elevation (Ft. MSL)
11			2.0	9		0	Continued from Sheet 1				
		S-6	100%	13		0	SILT, little - some clay; rust, gray,				
12	12.0			15			yellow & brown; v stiff; damp				
				19							
13		S-7	2.0	9		0	little clay; yellowish brown & gray;				
			100%	9		0	stiff; damp to moist (13.5-ft)				
14	14.0			9							
				2							
15		S-8	2.0	4	08	0	wet at 15.5-ft				
			100%	5		0					
16	16.0			6							
				6							
17		S-9	2.0	8		0	trace clay; orangish-brown, tan &				
			100%	13		0	pink - mottled w/ gray vert fracture				
18	18.0			21			v stiff; damp				
19		A-N	--	--	--	--					
20	20.0						20.0			20.0	97.50
							BOH at 20.0-ft bgs				
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											

DRILLING CO.: Geoworks, Inc. BAKER REP.: Mark DeJohn

DRILLER: Daniel Rolon BORING NO.: 54-TW01 SHEET 2 OF 2

Baker

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT:	SMWU 54 - Sampling and Analysis Report		
PROJ. NO.:	CTO-099	BORING NO.:	54-TW02
COORDINATES:	EAST: 761635.567	NORTH:	139282.8632
ELEVATION:	SURFACE: 117.5	TOP OF PVC CASING:	118.22

Rig: Mobile B-61								
	Split Spoon	**Casing**	**Augers**	**Core Barrel**	**Date**	**Progress (Ft.)**	**Weather**	**Depth to Water (Ft.)**
Size (ID)	2-3/8-in	--	4-1/4-in	--	12/15/00	0.0 - 18.0	M sunny, mid 80s	13.5
Length	2-ft	--	5-ft	--				
Type	Stainless	--	HSA	--				
Hammer Wt.	140	--	--	--				
Fall	30-in	--	--	--				

Remarks: Sample ID = 54-SB02-__ (with suffix shown below)
Surface elevation is an average elevation of nearby surface soil samples

SAMPLE TYPE

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

WELL INFORMATION

Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
Sch 40 PVC Casing	2-in	0	8
Sch 40 PVC 10-Slot Screen	2-in	8	18

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail			Elevation (Ft. MSL)
1		S-1	1.8 90%	15 24 18 10		0 / 0	F SAND, some silt & f/c gravel & cinders; dk brown & black, trace green staining; dense; damp (FILL)				
2	2.0									2.0	115.50
3		S-2	1.3 65%	8 17 22 19	02	26 / 0	CLAY, little silt; mottled orange & reddish-brown; hard; damp (NATIVE)				.
4	4.0										
5		S-3	1.3 65%	11 16 22 22		0 / 0	mottled red & gray				
6	6.0										
7		S-4	1.2 60%	12 18 19 22		6.5 / 0					
8	8.0									8.0	117.50
9		S-5	1.7 85%	5 10 9 10		0 / 0	little silt, trace c sand; mottled orangish & yellowish-brown w/ gray clay-filled vert fractures				
10	10.0										
				8			Match to Sheet 2				

DRILLING CO.:	Geoworks, Inc.	BAKER REP.:	Mark DeJohn
DRILLER:	Daniel Rolon	BORING NO.:	54-TW02 SHEET 1 OF 2

Baker

Baker Environmental

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: SMWU 54 - Sampling and Analysis Report

CTO NO.: CTO-099 BORING NO.: 54-TW02

SAMPLE TYPE

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

DEFINITIONS

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

Depth (Ft.)		Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail				Elevation (Ft. MSL)
11			2.0	6	06	0	Continued from Sheet 1					
		S-6	100%	5		0	moist					
12	12.0			5								
				5								
13		S-7	2.0	5		0	wet at 13.4-ft					
			100%	6		0						
14	14.0			6								
				6								
15		S-8	2.0	6		0	m stiff; damp					
			100%	1		0						
16	16.0			2								
17		A-N	--	--		--						
18	18.0						18.0			18.0		99.50
							BOH at 18.0-ft bgs					
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												

DRILLING CO.: Geoworks, Inc. BAKER REP.: Mark DeJohn

DRILLER: Daniel Rolon BORING NO.: 54-TW02 SHEET 2 OF 2

SOIL BORING LOG

Exploration for:	Site Characterization	Location	
Date:	March 17, 1995		510
Boring No.:	SB-14		
Recorded By:	L. Griffith	Water Table	
Drill Type:	Hollow Stem Auger		approx. 14.0 BLS
Weather:	Sunny, 80°		

Sample No.	Type	Depth		No. of Blows	Soil Description and Boring Log
		From	To		
SB-14	SPT	0	2	24, 16, 17, 19	2.5 YR 5/4 light olive brown clay, top 6" of spoon, 2.5 YR 4/6 dark red clay, (see note A below)
SB-14	SPT	2	4	24, 24, 26, 27	7.5 YR 5/8 strong brown clay, trace fine gravel, moist, very stiff
SB-14	SPT	4	6	50 @ 4"	Same as above
SB-14	SPT	6	8	50 @ 4"	Same as above, trace coarse gravel
SB-14	SPT	8	10	21, 30, 50 @ 4"	2.5 YR 5/4 light olive brown clay, slightly moist, stiff
SB-14	SPT	10	12	25, 33, 44, 45	Same as above
SB-14	SPT	12	14	29, 38, 50 @ 6"	5 YR 5/3 olive clay, trace fine gravel, slightly moist, very stiff
SB-14	SPT	14	16	41, 50 @ 3"	5 YR 6/3 olive clay, trace fine to medium gravel, slightly moist
SB-14	SPT	16	18	50 @ 4"	5 YR 5/3 olive clay, trace fine to medium gravel, slightly moist, stiff
SB-14	SPT	18	20	50 @ 4"	2.5 YR 5/4 light olive brown clay, slightly moist

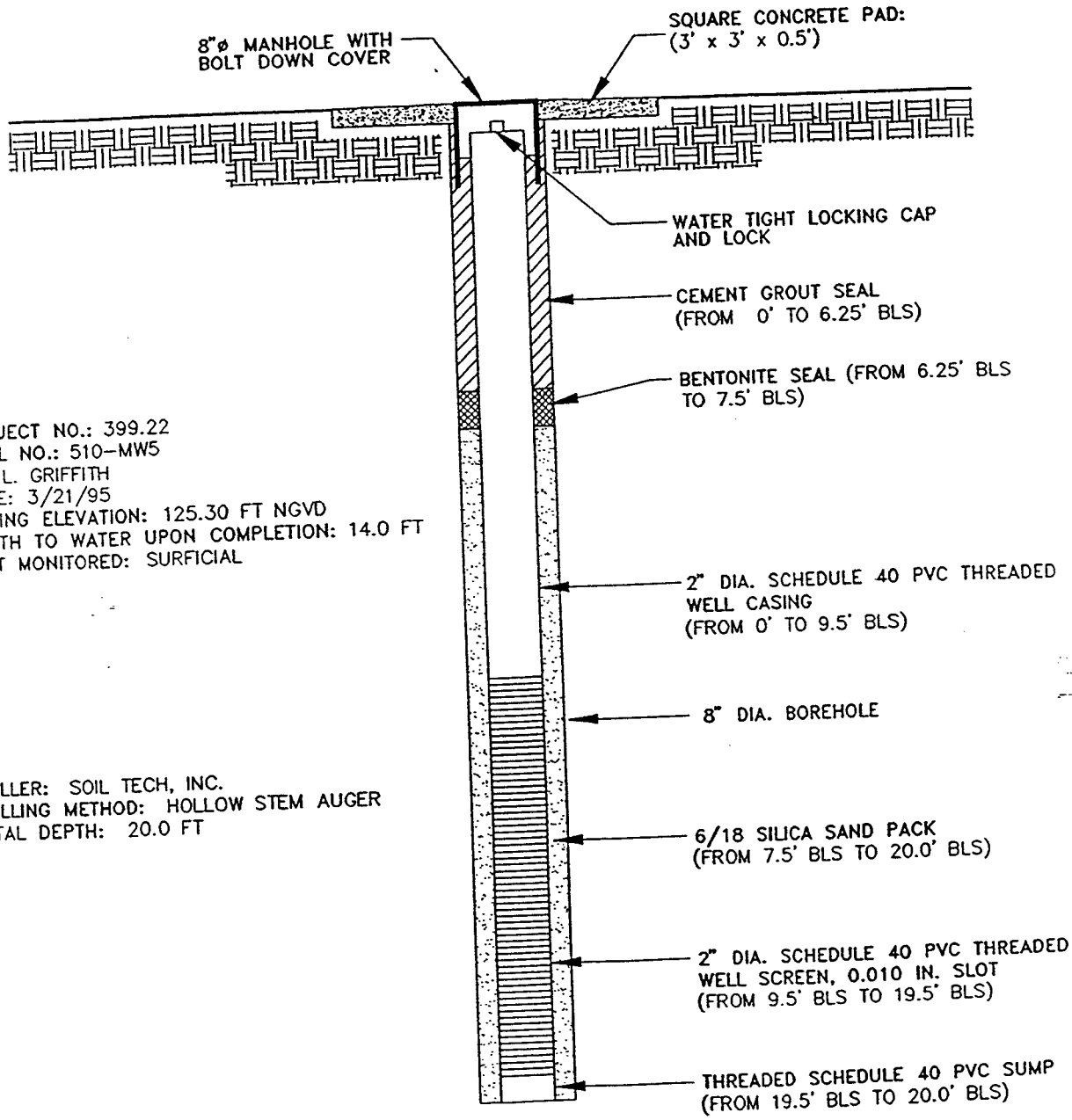
Remarks

PH - post hole

SPT - standard penetration test

Note: A = trace fine to coarse gravel, slightly moist, very stiff, bottom 18" of spoon

510–MW5



PROJECT NO.: 399.22
WELL NO.: 510–MW5
BY: L. GRIFFITH
DATE: 3/21/95
CASING ELEVATION: 125.30 FT NGVD
DEPTH TO WATER UPON COMPLETION: 14.0 FT
UNIT MONITORED: SURFICIAL

DRILLER: SOIL TECH, INC.
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 20.0 FT

(DRAWING NOT TO SCALE)

BLS = BELOW LAND SURFACE

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE #510

MONITORING WELL 510-MW5 CONSTRUCTION DETAILS

FIGURE --

EDIT: 21JUN95 27 JD
19JUN95 26 JR
D:\399ZZ\399ZZWL1.DWG

SOIL BORING LOG

Exploration for: Site Characterization	Location
Date: Feb. 15, 1995	510
Boring No.: SB-4	Water Table
Recorded By: M. Bauer	approx. 9.92 ft BLS
Drill Type: Hollow Stem Auger	
Weather: Ptly Cloudy, 80° Breezy	

Sample No.	Type	Depth		No. of Blows	Soil Description and Boring Log
		From	To		
SB-4	PH	0	2	N/A	2.5/10 Y Greenish black clay
SB-4	PH	2	4	N/A	10 YR 3/1 dark gray clay with pebble sized fill
SB-4	SPT	4	6	3, 2, 4, 5	10 YR 3/6 dark yellowish brown clay with pebble sized fill
SB-4	SPT	6	8	2, 4, 9, 11	10 YR 4/4 dark yellowish brown clay with pebble sized pieces of carbon
SB-4	SPT	8	10	5, 10, 13, 22	10 YR 4/4 dark yellowish brown and 6/10 greenish gray clay
SB-4	SPT	10	12	4, 12, 19, 11	7.5 YR 4/4 brown clay (moist)
SB-4	SPT	12	14	5, 7, 9, 11	7.5 YR 7/1 light gray clay (moist)
SB-4	SPT	14	16	5, 7, 10, 13	2.5 YR 5/6 red clay (moist)
SB-4	SPT	16	18	5, 7, 11, 12	7.5 YR 7/1 light gray and 2.5 YR 5/6 red clay (moist)
SB-4	SPT	18	20	NA	Drillers misunderstood instructions. Did not collect sample from 18-20
SB-4	SPT	20	22	4, 7, 10, 12	Same as above with 5 YR 5/8 mottled clay (moist)
SB-4	SPT	23	25	4, 5, 6, 8	Same as above (moist)

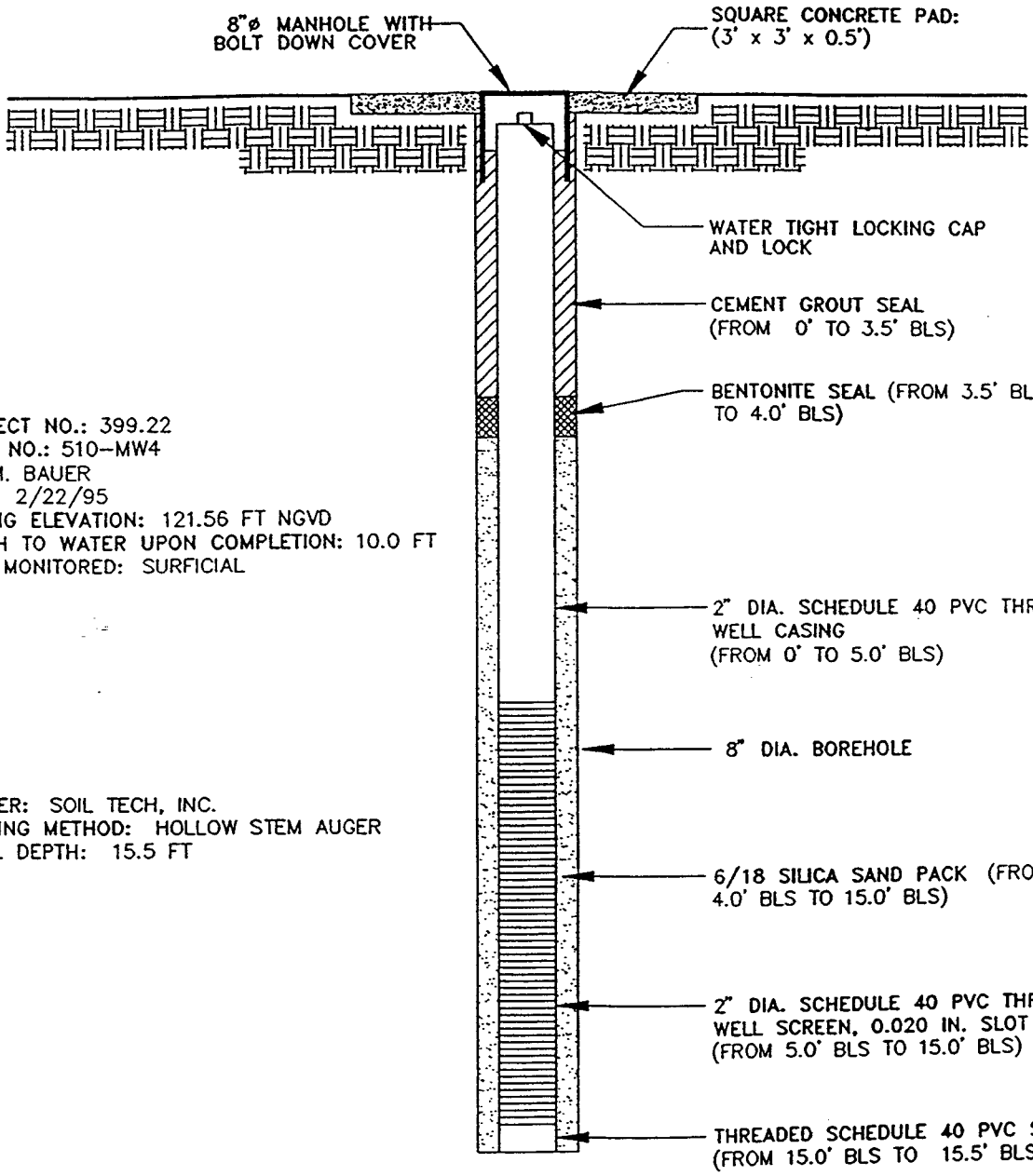
Remarks

PH - post hole

SPT - standard penetration test

NA - not applicable

510–MW4



PROJECT NO.: 399.22
WELL NO.: 510–MW4
BY: M. BAUER
DATE: 2/22/95
CASING ELEVATION: 121.56 FT NGVD
DEPTH TO WATER UPON COMPLETION: 10.0 FT
UNIT MONITORED: SURFICIAL

DRILLER: SOIL TECH, INC.
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 15.5 FT

(DRAWING NOT TO SCALE)

BLS = BELOW LAND SURFACE

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE #510

MONITORING WELL 510-MW4 CONSTRUCTION DETAILS

FIGURE --

T: 21JUN95 27 JD
JUN95 26 JR
\39922\39922WL2.DWG

SOIL BORING LOG

Exploration for: Site Characterization	Location
Date: Feb. 20, 1995	510
Boring No.: SB-12	Water Table
Recorded By: M. Bauer	approx. 9.30 ft BLS
Drill Type: Hollow Stem Auger	
Weather: Sunny, breezy, 85°	

Sample No.	Type	Depth		No. of Blows	Soil Description and Boring Log
		From	To		
SB-12	PH	0	2	N/A	10 YR 3/2 very dark grayish brown clay with pebble sized fill
SB-12	PH	2	4	N/A	2.5 YR 4/4 olive brown clay
SB-12	SPT	4	6	2, 2, 3, 5	2.5 YR 5/3 light olive brown clay with gravel sized rocks
SB-12	SPT	6	8	2, 3, 5, 7	2.5 YR 4/3 olive brown clay with pebble sized limerock
SB-12	SPT	8	10	3, 6, 9, 9	5 YR 7/3 pale yellow clay (moist)
SB-12	SPT	10	12	6, 7, 13, 20	7.5 YR 4/3 brown and 2.5 YR 4/6 dark red clay with limerock pebbles (moist)

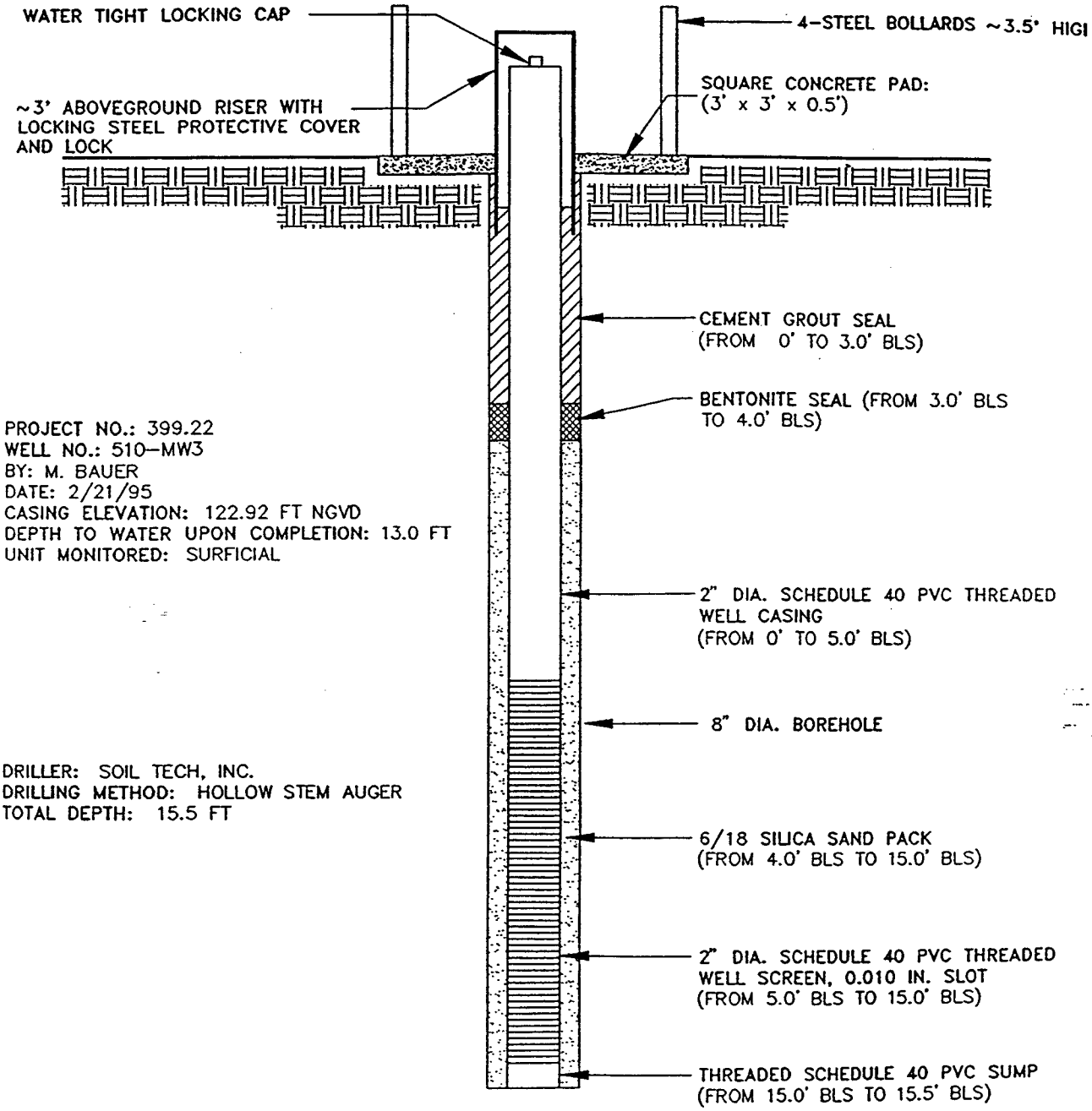
Remarks

PH - post hole

SPT - standard penetration test

NA - not applicable

510–MW3



PROJECT NO.: 399.22
WELL NO.: 510–MW3
BY: M. BAUER
DATE: 2/21/95
CASING ELEVATION: 122.92 FT NGVD
DEPTH TO WATER UPON COMPLETION: 13.0 FT
UNIT MONITORED: SURFICIAL

DRILLER: SOIL TECH, INC.
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 15.5 FT

(DRAWING NOT TO SCALE)

BLS = BELOW LAND SURFACE

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE #510

MONITORING WELL 510-MW3 CONSTRUCTION DETAILS

FIGURE --

DATE: 21JUN95 27 JD
REVISED 26 JR
B:\399ZZ\399ZZWL5.DWG

SOIL BORING LOG

Exploration for: Site Characterization	Location
Date: Feb. 16, 1995	510
Boring No.: SB-6	Water Table
Recorded By: M. Bauer	approx. 13.64 ft BLS
Drill Type: Hollow Stem Auger	
Weather: Sunny 80° light breeze	

Sample No.	Type	Depth		No. of Blows	Soil Description and Boring Log
		From	To		
SB-6	PH	0	2	N/A	7.5 YR 3/2 dk brown clay with pebble sized carbon
SB-6	PH	2	4	N/A	7.5 YR 4/6 strong brown clay
SB-6	SPT	4	6	5, 8, 9, 12	7.5 YR 4/4 brown clay
SB-6	SPT	6	8	5, 9, 12, 16	7.5 YR 5/6 strong brown clay
SB-6	SPT	8	10	5, 8, 12, 17	7.5 YR 6/4 light brown clay with pebble sized limerock
SB-6	SPT	10	12	5, 8, 13, 16	7.5 YR 5/4 and 7.5 YR 7/4 mottled clay (moist)
SB-6	SPT	12	14	6, 10, 13, 17	7.5 YR 7/4 and 5 YR 5/6 mottled clay (moist)
SB-6	SPT	14	16	4, 5, 9, 14	5 YR 5/6 and 10 YR 6/4 mottled clay (moist)

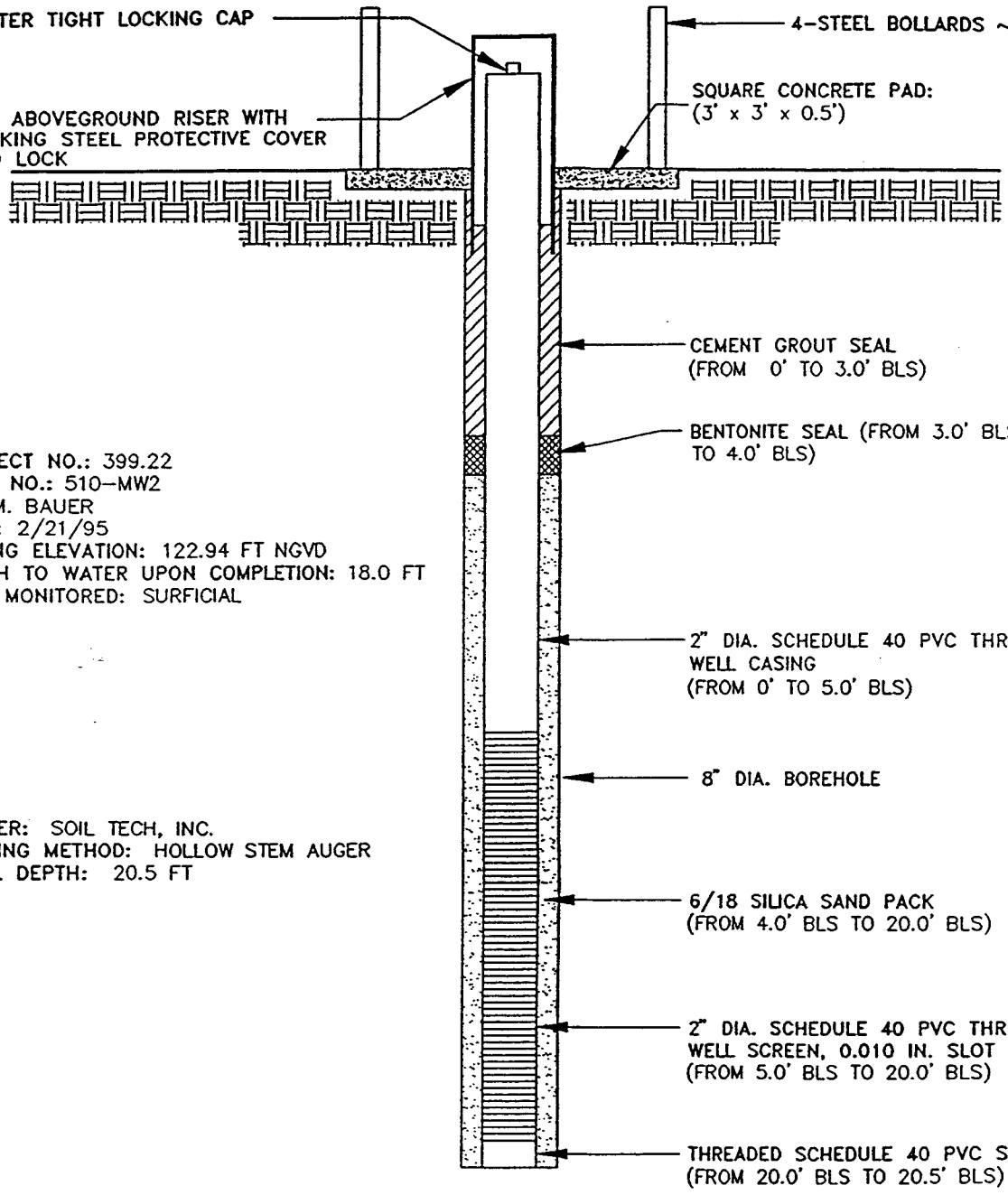
Remarks

PH - post hole

SPT - standard penetration test

NA - not applicable

510–MW2



'ROJECT NO.: 399.22
'VELL NO.: 510–MW2
3Y: M. BAUER
)ATE: 2/21/95
:ASING ELEVATION: 122.94 FT NGVD
)EPTH TO WATER UPON COMPLETION: 18.0 FT
JNIT MONITORED: SURFICIAL

)RILLER: SOIL TECH, INC.
)RILLING METHOD: HOLLOW STEM AUGER
OTAL DEPTH: 20.5 FT

(DRAWING NOT TO SCALE)

BLS = BELOW LAND SURFACE

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE #510

MONITORING WELL 510-MW2 CONSTRUCTION DETAILS

FIGURE --

3JUN95 27 JD
95 26 JR
922\399ZZWL4.DWG

SOIL BORING LOG

Exploration for: Site Characterization	Location
Date: Feb. 14, 1995	510
Boring No.: SB-2	Water Table
Recorded By: M. Bauer/J. Garrido	approx. 6.10 ft BLS
Drill Type: Hollow Stem Auger	1/100' Free product in bailer
Weather: Sunny, Breezy 85°	

Sample No.	Type	Depth		No. of Blows	Soil Description and Boring Log
		From	To		
SB-2	PH	0	2	N/A	7.5 YR 4/4 brown rocks & fine sand
SB-2	PH	2	4	N/A	7.5 YR 4/4 brown rocks & fine sand
SB-2	SPT	4	6	11, 9, 9, 9	Gravel size granite fill
SB-2	SPT	6	8	11, 11, 11, 7	Gravel sized granite fill (moist)
SB-2	SPT	8	10	7, 4, 2, 8	Coarse black sand, clay found at bottom of spoon (wet)

Remarks

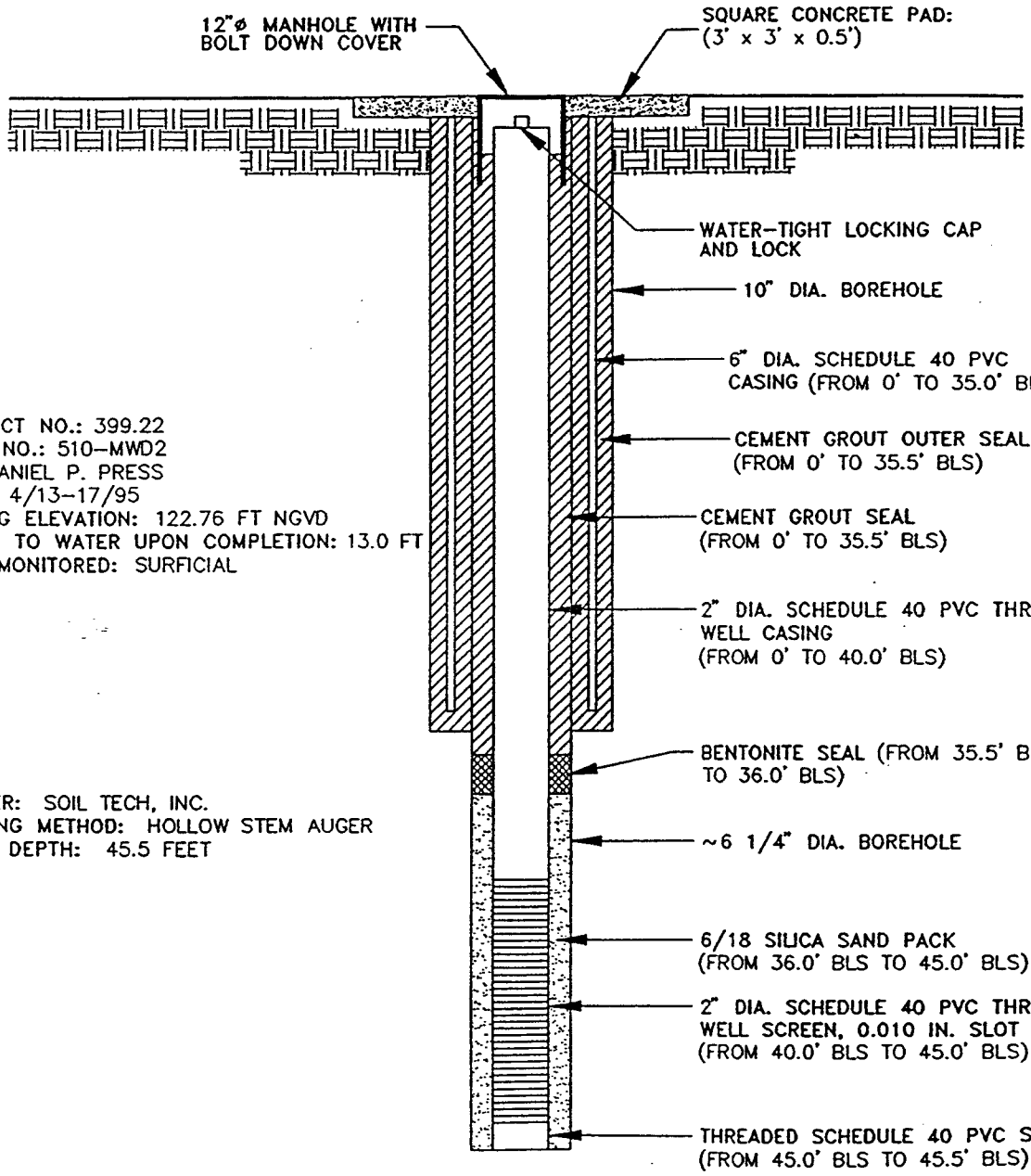
PH - post hole

SPT - standard penetration test

NA - not applicable

4991047G

510-DW2



PROJECT NO.: 399.22
WELL NO.: 510-MWD2
BY: DANIEL P. PRESS
DATE: 4/13-17/95
CASING ELEVATION: 122.76 FT NGVD
DEPTH TO WATER UPON COMPLETION: 13.0 FT
UNIT MONITORED: SURFICIAL

DRILLER: SOIL TECH, INC.
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 45.5 FEET

(DRAWING NOT TO SCALE)

BLS = BELOW LAND SURFACE

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

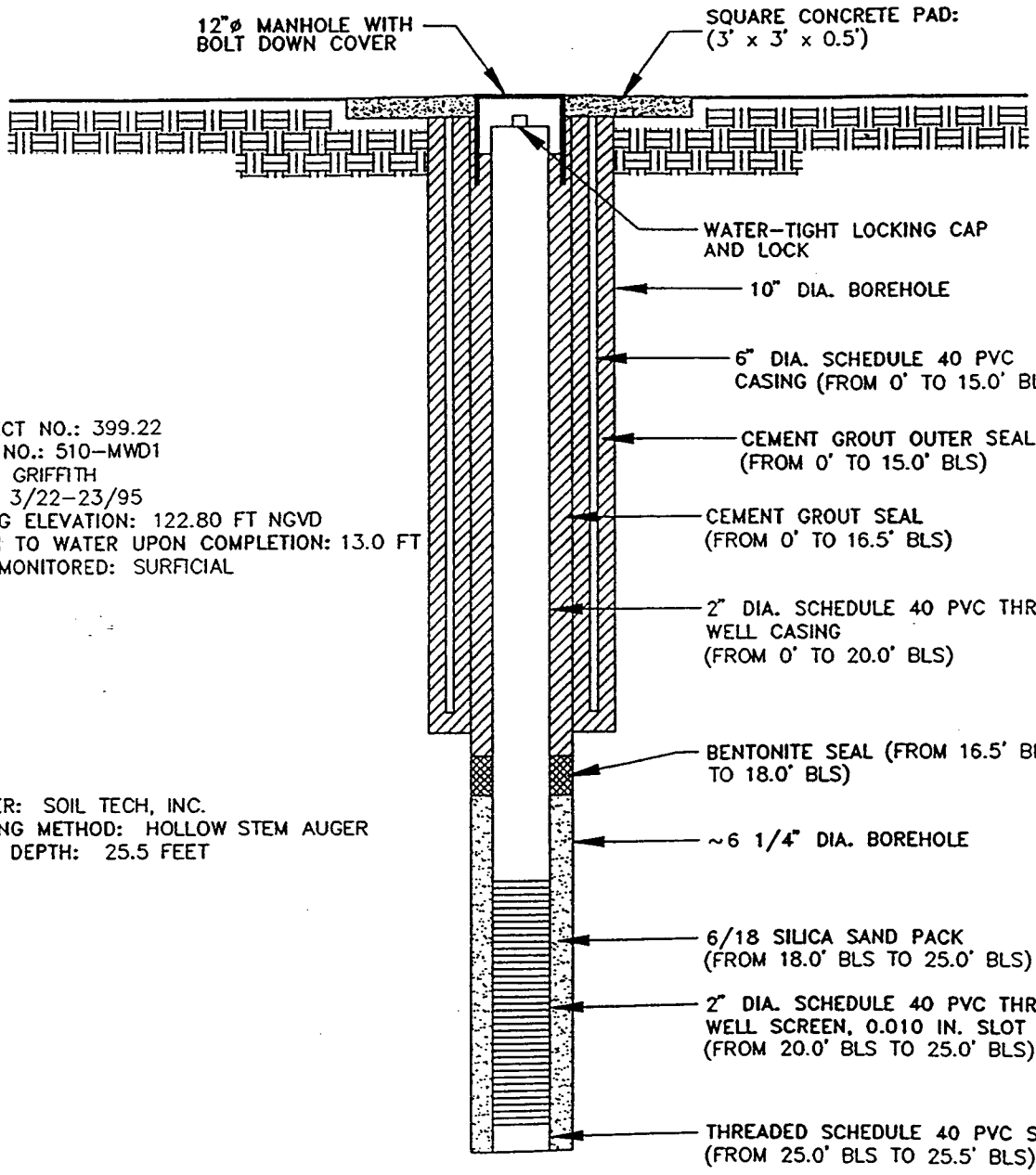
ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE #510

MONITORING WELL 510-DW2 CONSTRUCTION DETAILS

FIGURE --

EDIT: 21JUN95 27 JD
19JUN95 26 JR
R:\399.22\399.22WL7.DWG

510–DW1



PROJECT NO.: 399.22
WELL NO.: 510–MWD1
BY: L. GRIFFITH
DATE: 3/22–23/95
CASING ELEVATION: 122.80 FT NGVD
DEPTH TO WATER UPON COMPLETION: 13.0 FT
UNIT MONITORED: SURFICIAL

DRILLER: SOIL TECH, INC.
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 25.5 FEET

(DRAWING NOT TO SCALE)

BLS = BELOW LAND SURFACE

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

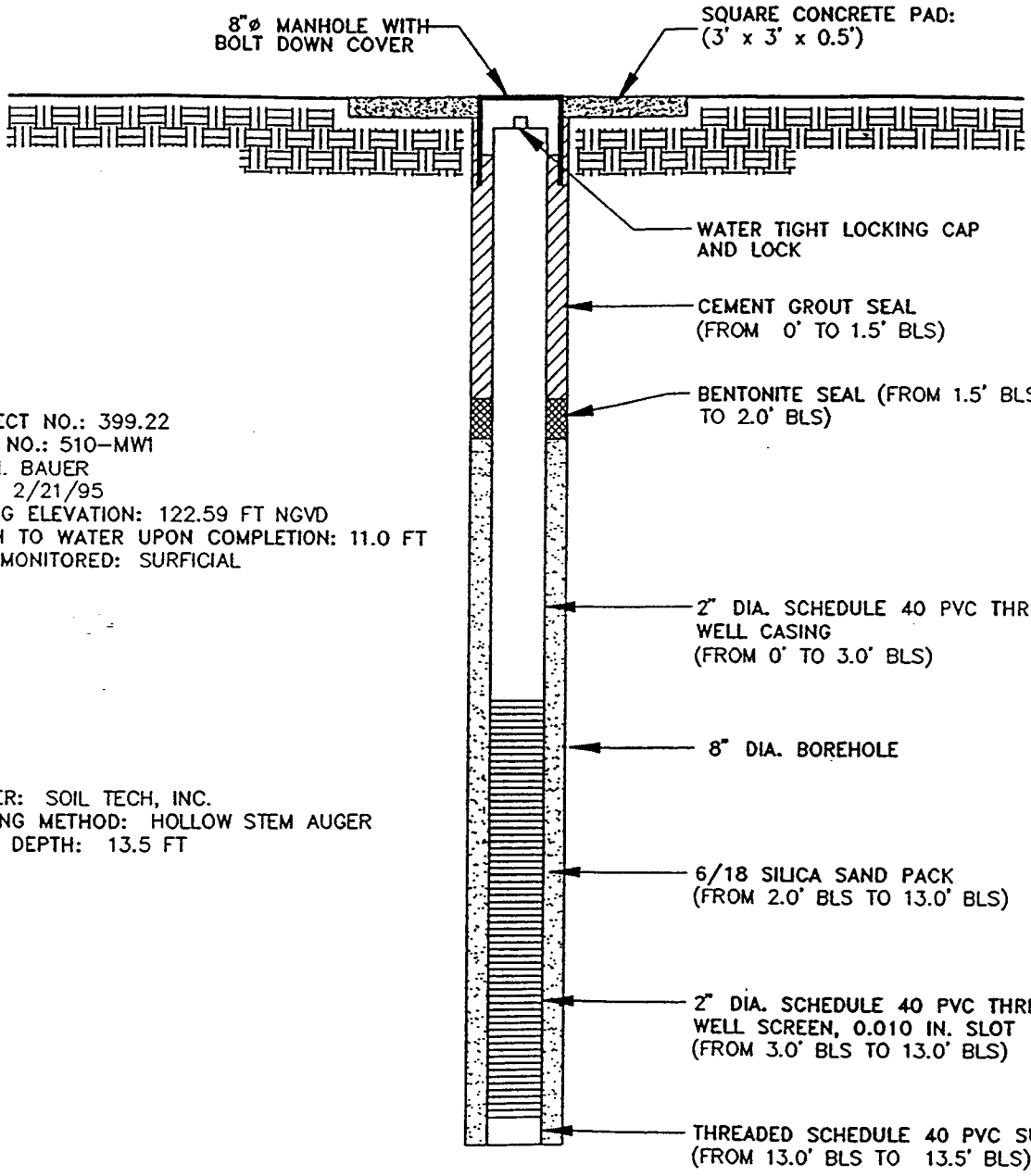
ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE #510

MONITORING WELL 510-DW1 CONSTRUCTION DETAILS

FIGURE --

DT: 21JUN95 27 JD
JUN95 26 JR
:\39922\39922WL6.DWG

510-MW1



PROJECT NO.: 399.22
WELL NO.: 510-MW1
BY: M. BAUER
DATE: 2/21/95
CASING ELEVATION: 122.59 FT NGVD
DEPTH TO WATER UPON COMPLETION: 11.0 FT
UNIT MONITORED: SURFICIAL

DRILLER: SOIL TECH, INC.
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 13.5 FT

(DRAWING NOT TO SCALE)

BLS = BELOW LAND SURFACE

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE #510

MONITORING WELL 510-MW1 CONSTRUCTION DETAILS

FIGURE --

JUN95 26 JR
\39922\39922WL3.DWG

APPENDIX B
Chain-of-Custody Records

SEVERN TRENT SERVICES

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Severn Trent Laboratories, Inc.

☒ 5102 LaRoche Avenue, Savannah, GA 31404
☐ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 Phone: (850) 878-3994 Fax: (850) 878-9504
☐ 900 Lakeside Drive, Mobile, AL 36693 Phone: (334) 666-6633 Fax: (334) 666-6696
☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049

PROJECT REFERENCE: ~~SWMU~~ SWMU 54/53	PROJECT NO.: 26007-099	PROJECT LOCATION (STATE): PR
STL (LAB) PROJECT MANAGER: Jon Edle	P.O. NUMBER: —	CONTRACT NO.: —
CLIENT (SITE): NSRR	CLIENT PHONE: 412-269-2031	CLIENT FAX: 412-269-2002
CLIENT NAME: Baker	CLIENT E-MAIL: jedel@mbakercorp.com	
CLIENT ADDRESS: 420 Rouser Rd Coraopolis, PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE ___ OF ___

STANDARD REPORT DELIVERY ☐
DATE DUE ___

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
DATE DUE ___

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	A-9 SV/Pest/PCB/Herb	A-9 Dioxin	A-9 metals	A-9 CN, F, H_2S MO 12/14/00	DRO	A-9 VOC + GRO					REMARKS
				PRESERVATIVE										
12/13/00	0956	54SS07	S	1	1	1	1	1	1					* F added to
	1022	54SS06	S	1	1	1	1	1	1					chain by
	1105	54SS14	S	1	1	1	1	1	1					mistake. Removed
↓	1100	54SS15	S	1	1	1	1	1	1					per Jon Edle
														MO 12/14/00

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS	12/7/00		Sarah Weller	12/13/00	1430			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE) DATE TIME

SEVERN TRENT SERVICES

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Severn Trent Laboratories, Inc.

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PROJECT REFERENCE: SWMU 54/53	PROJECT NO.: 26007	PROJECT LOCATION (STATE):	PAGE / OF
STL (LAB) PROJECT MANAGER: Jon Edel	P.O. NUMBER:	CONTRACT NO.:	STANDARD REPORT DELIVERY ☐ DATE DUE
CLIENT (SITE): NSRR	CLIENT PHONE: 412-269-2031	CLIENT FAX: 412-269-2002	EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE
CLIENT NAME: Baker	CLIENT E-MAIL: jedel@mbakercorp.com		
CLIENT ADDRESS: 420 Rouser Rd, Coraopolis PA 15108			
COMPANY CONTRACTING THIS WORK (if applicable)			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / PRESERVATIVE / NUMBER CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	A-9 SV/Herb/Pest, PCB	A-9 Dioxin	A-9 metals	A-9 CN, F, H_2S	DRO	A-9 VOC+GRO					REMARKS
12/13/00	1030	545501	S	1	1	1	1	1	1					* F added to
	1235	545502	S	1	1	1	1	1	1					COC by mistake.
↓	1245	545512	S	1	1	1	1	1	1					Removed per
														Jon Edel.
														MO
														12/14/00

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarel Ellelle	12/13/00	1430			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY (SIGNATURE): [illegible]

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☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049

PROJECT REFERENCE: SWMU 53/54	PROJECT NO.: 26007-099	PROJECT LOCATION (STATE): P.R.	PAGE / OF
STL (LAB) PROJECT MANAGER: Angie Weimerskirk	P.O. NUMBER	CONTRACT NO.	STANDARD REPORT DELIVERY ☐ DATE DUE
CLIENT (SITE): USRR	CLIENT PHONE: 412-269-2009	CLIENT FAX: 412-269-2002	EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL: mkimes@mbakercorp.com		
CLIENT ADDRESS: 420 Rouser Rd AOP-3 Coraopolis, PA 15108			
COMPANY CONTRACTING THIS WORK (if applicable)			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / NUMBER CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	APP. IX SVOC, Pest-PCB, Herb., OP-Pest	APP. IX VOC, TPH GRO	APP. IX Dioxin	APP. IX Metals	APP. IX CN, F, Hg, S	TPH DRO					REMARKS
				—	—	PRESERVATIVE								
12/14/00	0852	545513D	S	X	X	X	X	X	X					Remove F per Jon Edel LO 12/18/00

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Jon C. Edel Jr.	12/14/00	1245			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE) DATE

SEVERN TRENT SERVICES

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Severn Trent Laboratories, Inc.

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☐ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (850) 878-3994 — Fax: (850) 878-9504
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☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE: SWMU 53/54	PROJECT NO.: 26007-099	PROJECT LOCATION (STATE): PR
STL (LAB) PROJECT MANAGER: Angie Weimerskirk	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE): NSRR	CLIENT PHONE: 412-269-2009	CLIENT FAX: 412-269-2002
CLIENT NAME: BAKER - Mark Kimes	CLIENT E-MAIL: mkimes@mbakercorp.com	
CLIENT ADDRESS: 420 Rouser Rd AOP-3 Coraopolis, PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE ___ OF ___

STANDARD REPORT DELIVERY ☐
DATE DUE ___

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
DATE DUE ___

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	App. IX SVOC, Pest-PCB, Herb, OP Pest	App. IX VOC, TPH GRO	App. IX Dioxin	App. IX Metals	App. IX CN, F, H_2S	TPH DRO	[redacted]				REMARKS
				—	— PRESERVATIVE									
				NUMBER CONTAINERS SUBMITTED										
12/13/00	1723	545503	S	X	X	X	X	X	X					Remove F per Jim Edel. MO 12/18/00
12/14/00	1025	545505	S	X	X	X	X	X	X					
12/14/00	0852	545513	S	X	X	X	X	X	X					
[redacted]			S											
[redacted]			S											
12/14/00	0852	545513 MS/MSD	S	X	X	X	X	X	X					

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Jim C. Edel Jr.	12/14/00	1245			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE) [illegible] TIME

SEVERN TRENT SERVICES

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

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PROJECT REFERENCE: SWMU 53/54	PROJECT NO.: 26005-099	PROJECT LOCATION (STATE): PA	PAGE / OF
STL (LAB) PROJECT MANAGER: Angie Weimerskirk	P.O. NUMBER:	CONTRACT NO.:	STANDARD REPORT DELIVERY [ ] DATE DUE
CLIENT (SITE): NSRR	CLIENT PHONE: 412-269-2009	CLIENT FAX: 412-269-2002	EXPEDITED REPORT DELIVERY (SURCHARGE) [ ] DATE DUE
CLIENT NAME: BAKER - Mark Kimes	CLIENT E-MAIL: mkimes@mbakercorp.com		
CLIENT ADDRESS: 420 Rouser Rd AOP-3 Coraopolis, PA 15108			
COMPANY CONTRACTING THIS WORK (if applicable):			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

MATRIX TYPE: S

REQUIRED ANALYSIS: App. IX Metals; Rest./PCBs

PRESERVATIVE: — —

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	App. IX Metals	Rest./PCBs	REMARKS
12/14/00	0833	535B04-02	X	X	
12/14/00	0800	535B04-00D	X	X	
12/13/00	1415	535B05-00	X	X	
12/13/00	1445	535B05-02	X	X	
12/13/00	1525	535B06-00	X	X	
12/13/00	1544	535B06-03	X	X	
12/13/00	1658	535S01	X	X	
12/13/00	1653	535S02	X	X	
12/13/00	1655	535S03	X	X	
12/13/00	1700	535S04	X	X	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Jon C. Edel	12/14/00	1245			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY BY: (SIGNATURE)

STL SAVANNAH LAB COPY

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ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Severn Trent Laboratories, Inc.

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- ☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
- ☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE: SWMU 53/54	PROJECT NO.: 26007-099	PROJECT LOCATION (STATE): PR.
STL (LAB) PROJECT MANAGER: Angie Weimerskirk	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE): NSRR	CLIENT PHONE: 412-269-2009	CLIENT FAX: 412-269-2002
CLIENT NAME: Baker- Mark Kimes	CLIENT E-MAIL: MKimes@mbakercorp.com	
CLIENT ADDRESS: 420 Rouser Rd Ao P-3 Coraopolis, PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE ___ OF ___

STANDARD REPORT DELIVERY ☐
DATE DUE ___

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
DATE DUE ___

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / NUMBER CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	App. IX SVOC, Pest-PCB, Herb., OP-Pest	App. IX VOC, GRO (TPH)	App. IX Dioxin	App. IV Metals	App. IX CN, F, H_2S	TPH DRO	Pest.-PCB	App. IX Metals		REMARKS
				1	1	PRESERVATIVE							
12/13/00	1705	535505	S				X			X			
12/13/00	1710	535506	S				X			X			
12/13/00	1710	535506D	S				X			X			
12/13/00	1710	535506MS/MSD	S				X			X			
12/14/00	1235	53ER01	W			~~X~~				2	X		
12/14/00	1255	53ER02	W			~~X~~				2	X		

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Jon C. Edel Jr.	12/14/00	1245			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE)

SEVERN TRENT SERVICES

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Severn Trent Laboratories, Inc.

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- ☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
- ☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE: SWMU 53/54	PROJECT NO.: 26002-099	PROJECT LOCATION (STATE): P.R.	PAGE / OF
STL (LAB) PROJECT MANAGER: Angie Weimerskirk	P.O. NUMBER:	CONTRACT NO.:	STANDARD REPORT DELIVERY ☐ DATE DUE
CLIENT (SITE): NSRR	CLIENT PHONE: 412-269-2009	CLIENT FAX: 412-269-2002	EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE
CLIENT NAME: Baker-Mark Kimes	CLIENT E-MAIL: mkimes@mbakercorp.com		
CLIENT ADDRESS: 420 Rouser Rd Ap-3 Coraopolis, PA 15108			
COMPANY CONTRACTING THIS WORK (if applicable)			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / NUMBER CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	App IX SVOC, Pest, PCB, Herb, OP Pest	App. IX VOC, TPH-GRO	App. IX Dioxins	App. IX Metals	App. IX CN, F, HS	TPH DRO	G.W. Quality Odor/Color	G.W. Quality Salinity/TDS/Corrosivity	G.W. Quality F/Cl/SO4	REMARKS
				— PRESERVATIVE —									
12/14/00	1655	545510	S	X	X	X	X	X	X				
12/14/00	1740	545511	S	X	X	X	X	X	X				
12/15/00	1020	510-MW1	W			2			2	1	1	1	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Jon C. Edel Jr.	12/15/00	1350			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE) K. [illegible] DATE 12/2/00 TIME 929

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- ☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE: SWMU 53/54	PROJECT NO.: 26007-099	PROJECT LOCATION (STATE): P.R.	PAGE ___ OF ___
STL (LAB) PROJECT MANAGER: Angie Weimerskirk	P.O. NUMBER:	CONTRACT NO.:	STANDARD REPORT DELIVERY ☐ DATE DUE ___
CLIENT (SITE): NSRR	CLIENT PHONE: 412-269-2009	CLIENT FAX: 412-269-2002	EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE ___
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL: mkimes@mbakercorp.com		
CLIENT ADDRESS: 420 Rouser Rd AOP-3 Coraopolis, PA 15108			
COMPANY CONTRACTING THIS WORK (if applicable):			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / PRESERVATIVE

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	App IX Rest-PCB	App IX SVOC	App IX Herbicides	App IX CN	App IX Sulfide	App IX Total Metal	Ground Quality Al, Mn, Cu, As, Zn, Fe, Hardness	App IX VOCs, BTEX	App IX GRO	REMARKS
				–	–	–	NaOH	Zinc Acetate	HNO3			HCl	
12/15/00	1020	510-MW1	W	2	2	2	1	1	1	1	3	3	
12/15/00	1345	54TB01	W								1	1	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Jon C. Edel Jr.	12/15/00	1350			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE) F. Swafford

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- ☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
- ☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE: SWMU 53/54	PROJECT NO.: 26002-099	PROJECT LOCATION (STATE): P.R.	PAGE / OF
STL (LAB) PROJECT MANAGER: Angie Weimerskirk	P.O. NUMBER	CONTRACT NO.	STANDARD REPORT DELIVERY ☐ DATE DUE
CLIENT (SITE): NSRR	CLIENT PHONE: 412-269-2009	CLIENT FAX: 412-269-2002	EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL: mkimes@mbakercorp.com		
CLIENT ADDRESS: 420 Rouser Rd Aop-3 Coraopolis, PA 15108			
COMPANY CONTRACTING THIS WORK (if applicable)			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / NUMBER CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	App. 1X SVOC, Pest, PCB, Herb, CP-Pest	App. 1X VOC, TPH-GRO	App. 1X Dioxin	App. 1X Metals	App. 1X pH, Cn, S, H_2S	TPH DRO					REMARKS
12/14/00	1641	545504	S	X	X	X	X	X	X					Remove F per
12/14/00	1641	545504D	S	X	X	X	X	X	X					Jon Edel
12/14/00	1706	545508	S	X	X	X	X	X	X					MD
12/14/00	1710	545509	S	X	X	X	X	X	X					12/18/00

PRESERVATIVE

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Jon C. Edel Jr.	12/15/00	1350			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE) — DATE

SEVERN TRENT SERVICES

Severn Trent Laboratories, Inc.

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☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)	MATRIX TYPE	REQUIRED ANALYSIS	PAGE 2 OF 2
SWMU 53	26007-099	PR			
STL (LAB) PROJECT MANAGER: Angie W	P.O. NUMBER	CONTRACT NO.			STANDARD REPORT DELIVERY ☐ DATE DUE_____
CLIENT (SITE): NSRE -	CLIENT PHONE: 412 2692009	CLIENT FAX			EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE_____
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL				
CLIENT ADDRESS: 420 Rouser Rd ADP3, Coraopolis PA 15108					
COMPANY CONTRACTING THIS WORK (if applicable)				PRESERVATIVE	NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	Pest/PCBs	NUMBER CONTAINERS SUBMITTED	REMARKS
12/17	1700	53WP01	X		
↓	1710	53WP02	X		
	1715	53WP03	X		
	1720	53WP04	X		
	MS 12/17/00				

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Walker	12/18	1510			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE) DATE TIME

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- ☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE: SWMU 59/9	PROJECT NO.	PROJECT LOCATION (STATE): PR	MATRIX TYPE
STL (LAB) PROJECT MANAGER: Angie W	P.O. NUMBER	CONTRACT NO.	
CLIENT (SITE): NSRR	CLIENT PHONE: 412 269 2009	CLIENT FAX	
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL		
CLIENT ADDRESS: 420 Rouser Rd Top 3 Coraopolis PA			
COMPANY CONTRACTING THIS WORK (if applicable)			

PAGE ___ OF ___

STANDARD REPORT DELIVERY ☐ DATE DUE ____

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE ____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / PRESERVATIVE / NUMBER CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	Aq SV/Pest RQ/Herb	Aq Metals	Aq CN/Hg/H2S	Aq Dioxin	Aq VOC/GRO	DRO					REMARKS
12/15	1300	545B01-00	X	X	X	X	X	X					
	1600	545B01-05	X	X	X	X	X	X					F not part of
	1550	545B01-08	X	X	X	X	X	X					App. IX list.
	1040	545B02-02	X	X	X	X	X	X					Removed per
↓	1040	545B02-06	X	X	X	X	X	X					Jon Edel
													MO 12/21/00

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Wilke	1550	12/18/00			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE) ____ DATE ____ TIME ____

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PROJECT REFERENCE: SWMU 54	PROJECT NO.: 26007-033	PROJECT LOCATION (STATE): PR
STL (LAB) PROJECT MANAGER: Angie W.	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE): NSRR	CLIENT PHONE: 412 269 2009	CLIENT FAX:
CLIENT NAME: Baker - Mark Kins	CLIENT E-MAIL:	
CLIENT ADDRESS: 420 Rouser Rd Top 3 Coraopolis PA		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE ___ OF ___

STANDARD REPORT DELIVERY ☐
DATE DUE ___

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
DATE DUE ___

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

PRESERVATIVE: HCl (A-9 VOC/BTEX), HCl (GRO)

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	A-9 SVOC	A-9 Herb	A-9 Pest/PCB	A-9 Dioxin	DRO	A-9 CN	A-9 Sulfide	A-9 metals	A-9 VOC/BTEX	GRO	REMARKS
12/16/00	1650	54SW01	W	2	2	2	2	2	1	1	1	3	3	
~~12/17/00~~		~~95W21 RW~~	~~W~~											
12/7/00	1445	95W22	W									3		
	1445	95W22D	W									3		
↓	1455	95W23	W									3		
12/16	1650	54SW01D	W									3	3	MO 12/18/00
12/16	1655	54SW02	W									3	3	
12/18/00	1615	TB04	W									3		

Added (3) GRO to 54SW01D + 54SW02. Samples received but not marked on COC per M. Russo MO 12/18/00

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Welch	12/18/00	1620			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY (SIGNATURE): K. Conner

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PROJECT REFERENCE: SWMU 54	PROJECT NO.: 26007-033	PROJECT LOCATION (STATE): PR	PAGE / OF
STL (LAB) PROJECT MANAGER: Angie W.	P.O. NUMBER	CONTRACT NO.	STANDARD REPORT DELIVERY ☐ DATE DUE
CLIENT (SITE): NSEC	CLIENT PHONE: 412 269 2009	CLIENT FAX	EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL		
CLIENT ADDRESS: 420 Rouser Rd AOP3 Coraopolis PA			
COMPANY CONTRACTING THIS WORK (if applicable)			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

MATRIX TYPE

REQUIRED ANALYSIS / NUMBER CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	A-9 SVOC	A-9 Herb	A-9 Pest PCB	A-9 Dioxin	PRO	A-9 CN	A-9 Sulfide	A-9 metals			REMARKS
			PRESERVATIVE										
12/16/00	1650	54SW01D	2	2	2	2	2	1	1	1			

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			[signature]	12/19/00	1625			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY (SIGNATURE): [signature] DATE: 12/19/00 TIME:

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PROJECT REFERENCE: SWMU 54	PROJECT NO.: 26007-033	PROJECT LOCATION (STATE):
STL (LAB) PROJECT MANAGER: Angie W	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE): NSRR	CLIENT PHONE: 412 269 2009	CLIENT FAX:
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL:	
CLIENT ADDRESS: 420 Rouser Rd Ste 3 Coraopolis PA		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE ___ OF ___

STANDARD REPORT DELIVERY ☐
DATE DUE _____

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

MATRIX TYPE

REQUIRED ANALYSIS / NUMBER CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	A-9 SVOC	A-9 Herb	A-9 Pest/PCB	A-9 Dioxin	PZO	A-9 CN	A-9 Sulfide	A-9 Metals			REMARKS
12/16/00	1655	54SW02	2	2	2	2	2	1	1	1			

PRESERVATIVE

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah A Wells	12/18/00	1635			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY (SIGNATURE):

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PROJECT REFERENCE: SWMU 54	PROJECT NO.: 26007-033	PROJECT LOCATION (STATE): PR	PAGE / OF
STL (LAB) PROJECT MANAGER: Angie W	P.O. NUMBER	CONTRACT NO.	STANDARD REPORT DELIVERY ☐ DATE DUE
CLIENT (SITE): NSRR	CLIENT PHONE	CLIENT FAX	
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL		EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE
CLIENT ADDRESS: 420 Kaiser Rd ADP3 Coraopolis PA			
COMPANY CONTRACTING THIS WORK (if applicable)			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	Aq SVOC	Aq Herb	Aq Pest/PCB	A-q Dioxin	~~Aq DRO~~ DRO	Aq Metals	A-q Sulfide	A-q Cyanide	A-q VOC/BTEX	Q RO
									HNO3			HCl	HCl
12/18/00	1005	510-DW2	W	2	2	2	2	2	1	1	1		

PRESERVATIVE

NUMBER CONTAINERS SUBMITTED

REMARKS

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Gillette	12/19	1450			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE (SIGNATURE): [illegible]

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PROJECT REFERENCE: SWMU 54	PROJECT NO.: 26007-033	PROJECT LOCATION (STATE): PR	PAGE / OF
STL (LAB) PROJECT MANAGER: Angie W	P.O. NUMBER	CONTRACT NO.	
CLIENT (SITE): [redacted]	CLIENT PHONE: 412 2692009	CLIENT FAX	
CLIENT NAME: [redacted] Markkiens	CLIENT E-MAIL		
CLIENT ADDRESS: 420 Rouser Rd AOP3 Coraopolis PA			
COMPANY CONTRACTING THIS WORK (if applicable)			

STANDARD REPORT DELIVERY ☐ DATE DUE_____

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE_____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

PRESERVATIVE

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	A-9 SVOC	A-9 Herb	A-9 Pest/PCB	A-9 Dioxin	DRO	A-9 metals	A-9 CN	A-9 Sulfide			REMARKS
12/19/00	0805	510-MW2D	W	2	2	2	2	2	1	1	1			

NUMBER CONTAINERS SUBMITTED

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah [illegible]	12/19	1500			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY BY: (SIGNATURE) [illegible]

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☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049

PROJECT REFERENCE: SWMU 54	PROJECT NO.: 26007-033	PROJECT LOCATION (STATE): PR	MATRIX TYPE
STL (LAB) PROJECT MANAGER: Angie W	P.O. NUMBER:	CONTRACT NO.:	
CLIENT (SITE): NSRR	CLIENT PHONE: 4122692009	CLIENT FAX:	
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL:		
CLIENT ADDRESS: 420 Rouser Rd AOP 3 Coraopolis PA			
COMPANY CONTRACTING THIS WORK (if applicable):			

PAGE ___ OF ___

STANDARD REPORT DELIVERY ☐
DATE DUE ___

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
DATE DUE ___

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / NUMBER CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	A-9 SVOC	A-9 Herb	A-9 Pest/PCB	A-9 Diesh	DRO	A-9 metals	A-9 CN	A-9 Sulfide	A-9 VOC/BTEX	GRO	REMARKS
		PRESERVATIVE							HNO3	NaOH	NaOH	HCl	HCl	
12/19/00	1005	54TW02	W	2	2	2	2		1	1	1	3	3	
		510-MW2D										3	3	
		510-DW1										3	3	
		510-MW03										3	3	
		510-DW02										3	3	
		TB06										2	1	

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah a Wells	12/19	1505			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY (SIGNATURE): B Cramer DATE: 12/20 TIME: 920

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PROJECT REFERENCE: SWMU 54	PROJECT NO.: 26007-090	PROJECT LOCATION (STATE): PR	PAGE / OF
STL (LAB) PROJECT MANAGER: Angie Weimerskirk	P.O. NUMBER	CONTRACT NO.	STANDARD REPORT DELIVERY ☐ DATE DUE
CLIENT (SITE): NSRR	CLIENT PHONE: (412) 269-2009	CLIENT FAX	EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE
CLIENT NAME: Baker - Mark Kines	CLIENT E-MAIL		
CLIENT ADDRESS: 420 Rouser Rd AOP3 Coraopolis PA 15108			
COMPANY CONTRACTING THIS WORK (if applicable)			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

PRESERVATIVE

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	A-9SVOC	A-9 Herb	A-9 Pest/PCB	A-9 Dioxin	DRO	A-9metals	A-9 CN	A-9 Sulfide			REMARKS
12/19	1005	510-MW02	W	2	2	2	2	2	1	1	1			

NUMBER CONTAINERS SUBMITTED

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Wade	12/19	1515			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								
RECEIVED FOR LABORATORY USE BY: (SIGNATURE) K Cunin	DATE 12/20/06	TIME						

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- ☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE: SWMU 54	PROJECT NO.: 26007-099	PROJECT LOCATION (STATE): PR
STL (LAB) PROJECT MANAGER: Angie Weimerskirk	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE): NSRR	CLIENT PHONE: 412-269-2009	CLIENT FAX:
CLIENT NAME: Baker-Mark Times	CLIENT E-MAIL:	
CLIENT ADDRESS: 420 Rouser Rd AOP3 Coraopolis PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE ___ OF ___

STANDARD REPORT DELIVERY ☐
DATE DUE ____

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
DATE DUE ____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

PRESERVATIVE

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	A-9SVOC	A-9 Metals	A-9 Pest/PCB	A-9 Dioxin	DRO	A-9 Met	A-9 CN	A-9 Sulfide	Salinity/TDS (Cl⁻)	Odor/Color/Sulfate	REMARKS
12/19	1005	510-MW02 ms		2	2	2	2	2	1	1	1	1	1	MW 12/20/10
↓	↓	510-MW02										1	1	Ground water quality should be analyzed on 510-MW02. Change made per Sarah. MW 12/20/10

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Ewell	12/19	1522			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE) K. Cox

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PROJECT REFERENCE: SWMU 54	PROJECT NO.: 26007-088	PROJECT LOCATION (STATE): PR
STL (LAB) PROJECT MANAGER: Angie Weimerskirk	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE): NSRR	CLIENT PHONE: 412-269-2009	CLIENT FAX:
CLIENT NAME: Baker - Marckimes	CLIENT E-MAIL:	
CLIENT ADDRESS: 420 Rouser Rd Ste 3 Coraopolis PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE ___ OF ___

STANDARD REPORT DELIVERY [ ] DATE DUE ____

EXPEDITED REPORT DELIVERY (SURCHARGE) [ ] DATE DUE ____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	A-q SVOC	A-q Herb	A-q Pest/PCB	A-q Dioxin	DRO	A-q metals	A-q CN	A-q Sulfide	Al, Mn, Cu, As, Zn, Fe	Fl, Cl, SO_4	REMARKS
		PRESERVATIVE							HNO3					
12/19	1005	510-MW02 msd	W	2	2	2	2	2	1	1	1	+	+	MP 12/20/10
↓	↓	510-MW02										1	1	Ground water quality should be analyzed on 510-MW02. Change made per Sarah. MP 12/20/10

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Wille	12/19	1526			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY BY (SIGNATURE): [illegible]

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☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049

PROJECT REFERENCE: SWMU 54	PROJECT NO.: 20007-099	PROJECT LOCATION (STATE): PR
STL (LAB) PROJECT MANAGER: Angie W	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE): NSRR	CLIENT PHONE: 412 269 2009	CLIENT FAX:
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL:	
CLIENT ADDRESS: 420 Rous Rd Ste 3 Coraopolis PA		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE ___ OF ___

STANDARD REPORT DELIVERY ☐
DATE DUE _____

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	A-9 SVOC	A-9 Herb	A-9 Pest/PCB	A-9 Dioxin	PZD	A-9 metals	A-9 CN	A-9 Sulfide			REMARKS
				PRESERVATIVE										
12/18	0840	51C - DW1	W	2	2	2	2	2	1	1	1			

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Gillette	12/19	1530			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY BY: (SIGNATURE)

SEVERN TRENT SERVICES

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Severn Trent Laboratories, Inc.

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☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax: (813) 885-7049

PROJECT REFERENCE: SWMU 54	PROJECT NO.: 26007-099	PROJECT LOCATION (STATE): PA
STL (LAB) PROJECT MANAGER: Angie Weimerskirk	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE): NSEC	CLIENT PHONE: 412-269-2009	CLIENT FAX:
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL:	
CLIENT ADDRESS: 420 Rouser Rd Ste 3 Coraopolis PA 15108		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE ___ OF ___

STANDARD REPORT DELIVERY ☐
DATE DUE ___

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
DATE DUE ___

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	A-9 SVOC	A-9 Herb	A-9 Pest/PCB	A-9 Dioxin	ORD	A-9 metals	A-9 CN	A-9 sulfide	A-9 VOC/BTEX	GRO	REMARKS
		REQUIRED ANALYSIS / PRESERVATIVE												
12/18	1010	510-MW04	W	2	2	2	2	2	1	1	1	3	3	
12/19	0805	510-MW02										3	3	
		510-MW02 ms										3	3	
		510-MW02 msd										3	3	
	1535	TB07										2	1	

NUMBER CONTAINERS SUBMITTED

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Gwilk	12/19	1540			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY (SIGNATURE): K. Crowe

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- ☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
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PROJECT REFERENCE: SWMU 54	PROJECT NO.: 26007-009	PROJECT LOCATION (STATE): PR	PAGE / OF
STL (LAB) PROJECT MANAGER: Angie Weimerskirk	P.O. NUMBER	CONTRACT NO.	STANDARD REPORT DELIVERY ☐ DATE DUE
CLIENT (SITE): NSRR	CLIENT PHONE: 412 269-2009	CLIENT FAX	EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE
CLIENT NAME: Bater - Mark Kimes	CLIENT E-MAIL		
CLIENT ADDRESS: 420 Rouser Rd Ste 3 Coraopolis PA 15108			
COMPANY CONTRACTING THIS WORK (if applicable)			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

MATRIX TYPE: W

REQUIRED ANALYSIS / NUMBER CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	A-9 SVOC	A-9 Herb	A-9 Pest/PCB	A-9 Dioxin	DRO	A-9 metals	A-9 CN	A-9 Sulfide			REMARKS
12/18	1040	510 MW03	2	2	2	2	2	1	1	1			

PRESERVATIVE

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Gibble	12/19	1545			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE) K Co...

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PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)
Swmu 9	B 26002-033	PR
STL (LAB) PROJECT MANAGER: Angie W	P.O. NUMBER	CONTRACT NO.
CLIENT (SITE): NSEB	CLIENT PHONE: 412 269 2009	CLIENT FAX
CLIENT NAME: Mark Kimes	CLIENT E-MAIL	
CLIENT ADDRESS		
COMPANY CONTRACTING THIS WORK (if applicable)		

MATRIX TYPE

PAGE ___ OF ___

STANDARD REPORT DELIVERY ☐
DATE DUE ____

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
DATE DUE ____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / PRESERVATIVE / NUMBER CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	A9 SVOC	A9 Herb	A9 Pest/PCB	A9 Dioxin	DRO	A9 metals	A9 CN	A9 Sulfide	A-9 VOC	GRO	REMARKS
12/20/00	0700	54TW01	2	2	2	2	2	1	1	1	3	3	
													Fed Ex # 8232 7444 6161
													Received vials for A9-VOC + GRO. Added to COC per M. Russo. KW 12/21/00

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			[signature]	12/20				
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								
RECEIVED FOR LABORATORY (SIGNATURE) [signature]	DATE 12/21/00	TIME	CUSTODY SEAL					

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- ☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE: FB	PROJECT NO.: 26007-099	PROJECT LOCATION (STATE):
STL (LAB) PROJECT MANAGER: Angie	P.O. NUMBER:	CONTRACT NO.:
CLIENT (SITE): NERR	CLIENT PHONE: 412 262 2009	CLIENT FAX:
CLIENT NAME: Baker	CLIENT E-MAIL:	
CLIENT ADDRESS:		
COMPANY CONTRACTING THIS WORK (if applicable):		

PAGE ____ OF ____

STANDARD REPORT DELIVERY ☐
DATE DUE _____

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	GRO	A-9 SVOC	A-9 HERB	A-9 Pest/PCB	A-9 Dioxin	PRO	A-9 metals	A-9 CN	A-9 Sulf.	A-9 VOC (BTEX)	REMARKS
				HCl						HNO3	NaOH	Zn Ac	HCl	
12/20	1630	2000 FB03	W	3	2	2	2	2	2	1	1	1	3	
12/20	1730	TB09A	W	1									3	(not labeled)

Rd 9XFF
8078 53756839

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Gillette	12/20	1775			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE) K Lemon

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PROJECT REFERENCE: RC	PROJECT NO.: 26007-099	PROJECT LOCATION (STATE): PR	PAGE 2 OF 2
STL (LAB) PROJECT MANAGER: Angie W	P.O. NUMBER:	CONTRACT NO.:	STANDARD REPORT DELIVERY ☐
CLIENT (SITE): NSRR	CLIENT PHONE: 412 269 2009	CLIENT FAX:	DATE DUE:
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL:		EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
CLIENT ADDRESS: 420 Rouser Rd ADP 3 Coraopolis PA			DATE DUE:
COMPANY CONTRACTING THIS WORK (if applicable):			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

MATRIX TYPE

REQUIRED ANALYSIS / PRESERVATIVE

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	A-9 SVOC	A-9 Herb	A-9 Pest/PCB	A-9 Dioxin	DRO	A-9 metals	A-9 CN	A-9 Sulfide	A-9 VOC (BTEX)	GRO	REMARKS
											HCl	HCl	
12/21	0845	54ER02	2	2	2	2	2	1	1	1	~~3~~	~~3~~	Peaqoff
12/21	~~0830~~	~~2000 FB02~~									~~3~~	~~3~~	8078 5375 6840
12/21	~~0815~~	~~TB10~~									~~3~~		

NUMBER CONTAINERS SUBMITTED

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Laval Weller	12/21/06	0915			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE)

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- ☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
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PROJECT REFERENCE	PROJECT NO. 26007-09a	PROJECT LOCATION (STATE) PR	MATRIX TYPE	REQUIRED ANALYSIS								PAGE / OF
STL (LAB) PROJECT MANAGER Angie	P.O. NUMBER	CONTRACT NO.		A-9 SVOC	A-9 Hands	A-9 Pest/PCB	A-9 Dioxin	ORD	A-9 Amotalo	A-9 CN	A-9 Sulf	STANDARD REPORT DELIVERY ☐ DATE DUE
CLIENT (SITE) NSRP	CLIENT PHONE 412 269 2009	CLIENT FAX										EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE
CLIENT NAME Baker - Markkins	CLIENT E-MAIL											
CLIENT ADDRESS 420 Rouses Rd Ap 3 Coraopolis Pa												
COMPANY CONTRACTING THIS WORK (if applicable)				PRESERVATIVE								NUMBER OF COOLERS SUBMITTED PER SHIPMENT:
SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION		NUMBER CONTAINERS SUBMITTED								REMARKS
12/21/00	0530	2000 FB02		2	2	2	2	2	1	1	1	Fed Ex # 8232 7444 4011

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Wille	12/21/00	926			
RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY (SIGNATURE) [illegible]

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- ☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
- ☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

ROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE) PR	MATRIX TYPE	REQUIRED ANALYSIS	PAGE / OF
TL (LAB) PROJECT MANAGER Angie W	P.O. NUMBER	CONTRACT NO.			STANDARD REPORT DELIVERY ☐ DATE DUE
IENT (SITE) NSER	CLIENT PHONE 412 269 2009	CLIENT FAX			EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE
IENT NAME Baker - Markkinos	CLIENT E-MAIL				
IENT ADDRESS					
MPANY CONTRACTING THIS WORK (if applicable)					NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	A-9 SVOC	A-9 Herb	A-9 Pest/PCB	A-9 Diox	OCD	A-9 metals	A-9 CN	A-9 #Sulfide			REMARKS
		PRESERVATIVE											
		NUMBER CONTAINERS SUBMITTED											
2/19	0940	~~54TW002~~ 54ER01	2	2	2	2	2	2	1	1			Fedex #
		MC 12/22/00											8232 7444
		MC Sunday											4022

LINQUISHED BY: (SIGNATURE) MPTY CONTAINERS	DATE	TIME	RELINQUISHED BY: (SIGNATURE) Sarah Wolle	DATE 12/21	TIME 933	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
CEIVED BY: (SIGNATURE) MPTY CONTAINERS	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

[redacted]

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- ☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (334) 666-6633 — Fax: (334) 666-6696
- ☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE) PR	MATRIX TYPE	REQUIRED ANALYSIS	PAGE	OF
STL (LAB) PROJECT MANAGER: Angie	P.O. NUMBER	CONTRACT NO.			STANDARD REPORT DELIVERY ☐ DATE DUE	
CLIENT (SITE): NSEC	CLIENT PHONE: 412 26a 2009	CLIENT FAX			EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE	
CLIENT NAME: Baker	CLIENT E-MAIL					
CLIENT ADDRESS						
COMPANY CONTRACTING THIS WORK (if applicable)				PRESERVATIVE	NUMBER OF COOLERS SUBMITTED PER SHIPMENT:	

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX	A-8SVOC	A-8 Herb	A-8 Pest/PCB	A-8 Dioxin	DRO	A-8 metals	A-8 CN	A-8 Sulfide			REMARKS
				NUMBER CONTAINERS SUBMITTED										
12/20/00	1730	54ER03	W	2	2	2	2	2	1	1	1			FedEx# 8232 7444 4033

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Weller	12/21/00	940			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE)	DATE	TIME	SAMPLE CONDITIONS			DISCREPANCIES
[illegible]						

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- ☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049

PROJECT REFERENCE: QC	PROJECT NO.	PROJECT LOCATION (STATE): PR	MATRIX TYPE
STL (LAB) PROJECT MANAGER: Angie W	P.O. NUMBER	CONTRACT NO.	
CLIENT (SITE): NSRR	CLIENT PHONE: 412 269 2009	CLIENT FAX	
CLIENT NAME: Baker - Marktimes	CLIENT E-MAIL		
CLIENT ADDRESS			
COMPANY CONTRACTING THIS WORK (if applicable)			

PAGE ____ OF ____

STANDARD REPORT DELIVERY ☐
DATE DUE _____

EXPEDITED REPORT DELIVERY (SURCHARGE) ☐
DATE DUE _____

NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

REQUIRED ANALYSIS / PRESERVATIVE / NUMBER CONTAINERS SUBMITTED

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	A-q SVOC	A-q Herb	A-q Pest/PCB	A-q Pioxin	DRO	A-q metals	A-q CN	A-q Sulfide			REMARKS
12/20/00	1530	2000 FB01	2	2	2	2	2	1	1	1			Fed Ex #
		9ER01						1					8232 7444 4044

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Lorel A Wille	12/21/00	953			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								

RECEIVED FOR LABORATORY USE BY: (SIGNATURE) [illegible]

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☐ 900 Lakeside Drive, Mobile, AL 36693 Phone: (334) 666-6633 Fax: (334) 666-6696
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PROJECT REFERENCE	PROJECT NO. 46007-044	PROJECT LOCATION (STATE)	MATRIX TYPE	REQUIRED ANALYSIS	PAGE	OF
STL (LAB) PROJECT MANAGER Angie W	P.O. NUMBER	CONTRACT NO.			STANDARD REPORT DELIVERY ☐ DATE DUE	
CLIENT (SITE) NSRR	CLIENT PHONE	CLIENT FAX			EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE	
CLIENT NAME Baker - Markkins	CLIENT E-MAIL					
CLIENT ADDRESS 420 Raser Rd Rt 3 Coraopolis PA						
COMPANY CONTRACTING THIS WORK (if applicable)				PRESERVATIVE	NUMBER OF COOLERS SUBMITTED PER SHIPMENT:	

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX	1-9 SVOC	1-9 Herb	1-9 Pest/PCB	1-9 Dioxin	DRO	1-9 metals	1-9 CN	1-9 Sulfide			REMARKS
				NUMBER CONTAINERS SUBMITTED										
12/21/00	0730	510-MW5	W	2	2	2	2	2	1	1	1			Fedex # 8232 7444 4055

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Laurel Weller	12/21/00	0005			
RECEIVED BY: (SIGNATURE) EMPTY CONTAINERS	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME
RECEIVED FOR LABORATORY USE BY: (SIGNATURE)	DATE	TIME						

SEVERN TRENT SERVICES

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☐ 900 Lakeside Drive, Mobile, AL 36693 Phone: (334) 666-6633 Fax: (334) 666-6696
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PROJECT REFERENCE: Summu 54	PROJECT NO.: 26007-029	PROJECT LOCATION (STATE): PR	PAGE / OF
STL (LAB) PROJECT MANAGER: Angie W	P.O. NUMBER	CONTRACT NO.	STANDARD REPORT DELIVERY ☐ DATE DUE
CLIENT (SITE): NSER	CLIENT PHONE: 412 2692009	CLIENT FAX	EXPEDITED REPORT DELIVERY (SURCHARGE) ☐ DATE DUE
CLIENT NAME: Baker - Mark Kimes	CLIENT E-MAIL		
CLIENT ADDRESS: 420 Rosser Rd Ap 3 Coraopolis PA			
COMPANY CONTRACTING THIS WORK (if applicable)			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE	4-9 SVOC, Pest/PCB, Herb, DP Pest	4-9 VOC, TPH-GRO	4-9 Dioxin	4-9 metals	4-9 CN, P, H2S	DRO	4-9 VOC/BTEX	GRO			REMARKS
				PRESERVATIVE										
				NUMBER CONTAINERS SUBMITTED										
12/20	1430	54SS10	S	1	1	1	1	1	1	✗	✗			Rd 9x#
12/20	1430	54SS11	S	1	1	1	1	1	1	✗	✗			8232 7444 4066
12/20	1630	2000FB01	W							3	3			
12/21	730	510-MW5	W							3	3			F removed per
12/21	1000	TB10	W							3				Jon Edel
12/21	830	2000FB02	W							3	3			MO 12/22/10
12/20		54ER01	W							3	3			
12/21		9ER01	W							3				
12/21	845	54ER02	W							3	3			
12/19	1730	54ER03	W							3	3			

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
EMPTY CONTAINERS			Sarah Wolle	12/21	1020			
RECEIVED BY: (SIGNATURE)	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**	**RECEIVED BY: (SIGNATURE)**	**DATE**	**TIME**
EMPTY CONTAINERS								
RECEIVED FOR LABORATORY USE BY: (SIGNATURE)	DATE	TIME						

APPENDIX C
Photographs from the SWMU 53 and 54 Field Investigation

APPENDIX C.1
Photographs from the SWMU 53 Field Investigation

APPENDIX C.1

SWMU 53 – Building 64 (Malaria Control Building)

Photo 1: View of Building 64 Looking South

APPENDIX C.1

SWMU 53 – Building 64 (Malaria Control Building)

Photo 2: View inside Building 64 Looking Northwest. The white circle on the top right corner of the photo indicates the approximate location on the floor where wipe sample 53WP01 was collected.

APPENDIX C.1

SWMU 53 – Building 64 (Malaria Control Building)

Photo 3: View inside Building 64 Looking West. The blue circle on the bottom left corner of the photo indicates the approximate location on the floor where wipe sample 53WP02 was collected.

APPENDIX C.1

SWMU 53 – Building 64 (Malaria Control Building)

Photo 4: View inside Building 64 Looking Northeast. The blue circle on the bottom left corner of the photo indicates the approximate location on the floor where wipe sample 53WP03 was collected.

APPENDIX C.1

SWMU 53 – Building 64 (Malaria Control Building)

Photo 5: View inside Building 64 Looking Southeast. The white circle on the bottom left corner of the photo indicates the approximate location on the floor where wipe sample 53WP04 was collected.

APPENDIX C.2
Photographs from the SWMU 54 Field Investigation

APPENDIX C.2

SWMU 54 – Building 1914 (Former NEX Repair/Maintenance Shop)

Photo 1: View of Building 1914 Looking Northeast.

APPENDIX C.2

SWMU 54 – Building 1914 (Former NEX Repair/Maintenance Shop)

Photo 2: View of Building 1914 and Open Storage Shed Looking Northeast.

APPENDIX D
Field Notes from the SWMU 53 and 54 Field Investigation

APPENDIX D.1
Field Notes from Jon Edel – Environmental Scientist/ Site Manager

Monday 12/11/00

0715 Arrive at airport (PIA).
0830 Meet up with all of Baker field team.
0905 Depart for P.R.
1411 Arrive at San Juan Airport. We will pick up our luggage and go to leaseway to pick up truck.
1830 Arrive at Palmas DelMar to pick up Keys.
2100 Left Palmas to go get supplies with field crew.
2230 Arrived back at PAlmas.

Jon C. Edel Jr.

Tuesday 12/12/00

0600 Leave PalMas DelMar with field crew.
0630 Arrive on Base.
0700 Arrive at Public Works Dept. to pick up Supplies at Madeline's office.
0745 Met with Madeline and Pedro about issues dealing with fieldwork. Spoke with a gentleman who gave us clearance to drill at SWMU 53. We also discussed the new style well caps.
0830 Leaving with Glare to pick up more Supplies. MKB and SARAH going to SWMU 53.
1000 Back on base
1010 Going to exchange to by minutes.
1020 Arrive back with Baker crew.
1040 Drillers are not on base. Spoke with Omar - they should be arriving soon.
1045 Met with fuels office to get permission to access the SWFF front gate.
1100 I am waiting for drillers - Baker crew going to lunch.
1110 Called STL to get a package count for FedEx shipments today. Michelle

Tuesday 12/12/00

Said that we should receive 44 packages.

1145 Went back to Cellular One to work on correcting phone problems.

1210 Arriving back at TWFF. MKD & Sarah said Drillers arrived at 1130.

1213 Drillers arrived with rig.

1220 They said they need clearing device. They wanted to see SWMU 53, 54, and 3.

1240 Arrive at SWMU 54 with drillers and Baker crew.

1253 Leaving to take drillers to SWMU 3.
* Talk to Madeline about lock at SWMU 54 gate.

1310 Arrive at SWMU 3 to show OMAR the locations. * Need to ask Madeline about well abandonment. Talk to MEK first about well abandonment.

1315 The supervisor of the contractor working at SWMU 3 would not let us on without proper equip.

Tuesday 12/12/00

Proper equipment is safety shoes and hard hat. He also doesn't want POV's back at SWMU 3 wells. RGW02 and RGW04 are in an active portion of the landfill. He said come back with proper equip. and talk to him. A drill rig and support vehicle are allowed back in. Omar informed us that they have to use the drill rig to pull augers out of holes at Bundy to do a breakdown on Cham Hill's job.

1355 Baker crew going to Public Works for FedEx Shipment. Called MEK about problems (clearing, etc.) waiting for phone call back.

1406 Going to Public Works to talk to Madeline and Herminio.

1415 Spoke with Madeline & Herminio about issues at SWMU 53 & 54. Herminio is going to call JA Jones to see if they can clear cut around Building 64. Madeline said

Tuesday 12/12/00

that it could take a couple of days because of no emergency, etc. Herminio will try. Madeline/ Herminio gave me the memorandum containing the excavation permits for SWMUs 53 and 54. MEK, MKD, Omar, and me decided to start at SWMU 3 punching wells. Madeline is going to make sure SWMU 54 is unlocked.

1515 MKD meets up with us at parking lot across from TWFF. Organizing equipment. (MKD, Sarah, and Clare)

1520 Herminio & Omar said JA Jones will clear site tomorrow morning at approximately 0730.

1550 Called STL to inform Michelle Owens that we did receive aqueous list of sample containers. No shipment sent out by Baker today.

1600 Called Darrin Hupe to talk about our shipment of equipment. No acid No methanol. A total of 3 boxes should arrive tomorrow. I need to pick up.

Tuesday 12/12/00

1620 Called STL because one container of lab grade D.I. was broken. Should be OK.

1730 Called Michelle again to verify questions.

1800 Leaving site for the day. Drillers left around 1700.

Jon C. Edell Jr.

Wednesday 12/13/00

0630 Arrive on base.

0654 Arrive at the TWFF to grab sample boxes to sample at SWMU 54.

0700 Left with Sarah to go get ice and proceed to SWMU 54.

0710 Marina closed till 0800 - proceeding to SWMU 54. Will pick ice on way back

0726 Arrive at SWMU 54. Both gates are still locked

0739 Tried calling Madeline, Pedro, Herminio to ask them to get SWMU 54 unlocked.

0740 Walking across the street to see if they know who is in charge of Bldg 1914.

0745 The woman said she has no idea.

0750 Flagging locations outside of the fence area. (545577, 545556, 545551, 545514, 545515.)

0800 Called Madeline about lock on gate at SWMU 54. She will not be in today. She is over on Vieques.

Wednesday 12/13/00

Damaryz told me she will try to get in touch with the point of contact for SWMU 54 and call me back.

0815 Left SWMU 54 to go buy minutes for the phone.

0825 Damaryz called me back and gave me the names of two gentleman at SOC South to get the gate opened.

0846 Met with MEK at SWMU 53 to check utilities.

0900 Heading to Public Works to find Glore and MKD.

0905 Arrived at Public Works. MKD & Glore not there.

0920 Sarah and I arrived at NEX Exchange to buy more minutes.

0930 Can't buy minutes till 1000.

0937 Leaving to go to SOC South to try to get SWMU 54 gates opened. We are proceeding to SWMU 54 directly to take surface soil samples.

0948 Arrive back at SWMU 54 to take samples. Found left gate opened.

Wednesday 12/13/00

0956 Taking S.S. sample from 545507.
1002 Taking S.S. sample from 545506.
1036 Taking SS sample from 545501
1100 Taking S.S. sample from 545515
1105 Taking S.S. sample from 545514
1110 MEK, Don, Kevin, and Glore stopped at SWMU 54.
1130 Leaving to go buy pick. (Jon, SARAH, Glore) MEK left.
1146 Back onsite - we will dump out 545507, 545506, 545501, and 545514. We will use a pick then mix the existing sample with new stuff so there is no bias.
1235 Collected 545502. (Surf. Soil Sample).
1245 Collected 545512. (Surf. Soil Sample).
1300 Proceeding back to exchange to buy minutes for phone and get lunch then to decon area to pack samples.
1314 Arrive at the exchange (SARAH, Glore, and me).
1340 Arrive back at TWFF decon area to pack samples. Could not buy

Wednesday 12/13/00

they (cellular one) were all out. We are going to pack up samples to ship out.
1405 Arrive at Public Works to pack coolers to ship out. Called FedEx.
1511 Finished packing samples awaiting FedEx.
1515 Met FedEx guy - dropped off samples no containers for us. When I called FedEx to arrange it she gave me the number NRR190 as reference.
1522 Going to SWMU 53 to see if Glore and MKB need anything.
1545 Leaving SWMU 53 to get gatorade and ice. Will be making a few phone calls.
1550 Can't make calls. the phone at the marina is gone.
1555 Proceeding to TWFF decon area to pick up more sample boxes.
1610 Arrive back at SWMU 53 to drop off ice and a cooler.
1625 Arrived at NEX Exchange to

Wednesday 12/13/00

make phone calls.

1634 Spoke with Michelle Russo about 3 missing Fedex packages and to let her know about our shipment today.

1640 Arrive at SWMU 54 to continue Sampling. Found gate was lock. I went over to next building where vehicles are stored and spoke with a Sgt. Freeman. He gave me the combination to the side gate lock. I will lock everytime I leave.

1700 Spoke with LT. Gary Torres about Sampling at SWMU 54. He was very informative about the site. He covered the oil/water separator with a yellow conex box in April 2000. That conex box was situated by the back shed in the right corner of the lot. Explained that the cement bunker in the right hand changing station closest to the right side of the building

Wednesday 12/13/00

contains very dangerous water standing. He warned us about mosquitos in the water. He said he had the building pressure washed and painted and sprayed with lye. He said any problems gaining access or with any military personnel, to give him a call at 397-1799.

1710 He left site.

1715 I was approached by Sgt. Freeman who initially gave me combination. He said that he was overriden and he incinuated we would have to leave. I told him about LT. Gary Torres and to contact him.

1723 Sarah collected S.S. sample at 545503. We took this more to the ~~right~~ left of our initially intent look at Bldg. 1914 because a conex box was setup in the way of the location on the figure. SARAH and I are flagging locations. JCE

1753 Leaving site to meet MKD and Glare at TWFF decon area. MEK showed up and left.

Wednesday 12/13/00

1810 Arrived at TWFF decon area. MKD and Clare were not there. Sarah and I dropped some equipment off and secured decon area

1823 Offsite for the day.

Jon C. Edwards

Thursday 12/14/00

0645 Arrive on base. (SARAH & JON)

0705 Arrive at TWFF decon area. Drillers were waiting for us. It is pouring down rain. Waiting for MKD to arrive at TWFF decon area.

0715 MKD arrived. We are getting equipment for the day. *need to call the lab about wipe sampling kit.

0745 MKD & SARAH leave for SWMU 53. I am waiting for drillers to leave to go to SWMU 53 so I can close gate.

0755 Drillers leave for SWMU 53. I closed gate. Rain has ceased. I am heading to SWMU 53 to use rods on one boring location.

0800 Proceeding to SWMU 54. (JON)

0822 Arrive at SWMU 54.

0852 Collecting 545513, 545513D, and 545513MS/MSD.

0900 Stopped by another military personnel he said he needs to talk to security in the next building to work everything

Thursday 12/14/00

out. He said I need a badge. He said that I should have a badge.

1025 Collecting S.S. sample at 545505.

1047 Leaving SWMU 54 to go to NEX exchange to call office and check on calling minutes.

1058 Arrive at the exchange to check on minutes and call office, STL.

1130 Bought minutes for phone. Call Michelle Russo - STL has not received samples yet. Chemicals are in Tennessee right now.

1145 Spoke Darrin Hupe to try to cancel orders for decon supplies. He said Methanol was delivered probably by another carrier. Nitric still in memphis. MKD wanted - though we should try to cancel order.

1155 Arrive back at TWFF decon area to work with samples.

1400 Left TWFF decon area to go to get ice. Called FedEx (shipping# 1112212)

1415 Arrived at Public Works to

Thursday 12/14/00

meet FedEx driver.

1520 Walk to Madeline's office to ask her about IDW and package of methanol. She was not there. Leaving to go back to TWFF decon area to pick up sample containers for SWMU 54.

1530 Arrive back at TWFF Decon area to pick up sample containers.

1538 Leaving to go to SWMU 54. (SARAH & JON)

1555 Spoke with Michelle at STL and she said they received first shipment - everything ok. She had a question about fluoride. She said they had it on the bottle list but it shouldn't be there. She said it is only analyzed with samples dealing with Georgia. She will not log it in - only log in CN and H_2S

1607 Arrive at SWMU 54 to take samples. Found some heavy construction equipment moving inside gate. Will wait till their finished.

1630 Heavy equipment out of the way MKD showed up.

1640 I am going to pick for SARAH

Thursday 12/14/00

and MKD.

1655 Sarah collecting S.S. sample at 545510. MKD explained that Kevin Cloe suggested that we take a worst case scenario sample in SWMU 9 Area C where he and MEK viewed an oil/water separator which had overflowed in the mangroves. * I will need to verify with MEK.

1710 Sarah collecting S.S. sample 545509.

1743 Baker leaving SWMU 54. Both gates are locked. Heading back to TWFF decon area to drop boxes off.

1756 Arrived at TWFF to unload equipment.

1800 Baker crew leaving TWFF decon area. Offsite for the day.

2028 Spoke with MEK about sampling question at SWMU 9. He wants us to take a SW/SD sample downgradient from the oil/water separator.

Jon E. Edel Jr.

Feiday 12/15/00

0635 Pass through gate 3.

0655 Arrive at TWFF decon area to pick up supplies for the day. Drillers waiting for us.

0800 Leaving for SWMU 54 to collect samples.

0814 Arrive at SWMU 54. MKD and Clare gubbing drillers going.

0830 Spoke with Madeline about box of methanol and IDW. She has the methanol. She said move the drums of IDW to Bldg 32. This Bldg. is located at the main entrance to the landfill. She said to take the first rt. hand road past public works. Look for landfill sign and huge concrete Bldg. Put drums on concrete pad infront of Bldg. This Bldg. is 11/45.

0855 Spoke with MEK. He wants MKD to remove stick up and pad from wells abandoning. Helping SARAH sample wells.

Friday 12/15/00

1100 Spoke with Michelle at the lab, she confirmed no diss. Metals at SWMU 54.

1134 Leaving SWMU 54 to go back to TWFF decon area to get more bottles.

1221 Arrive back at SWMU 54 to sample 510-MW4.

1325 Leaving SWMU 54 to go back to TWFF decon area to pack samples. ~~54~~ JCE 510-MW4 bailed dry, have to sample Monday.

1339 Arrive back at decon area to pack samples.

1440 Heading to marina to get ice.

1442 Called FedEx to arrange pick up. Schedule # NRR 224.

1530 Arrived at SWMU 54 to get dines off of MKD.

1545 Arrived at exchange to drop off sample with FedEx

1605 Met FedEx guy and dropped off samples.

1615 Arrived at Public Works to pick

Friday 12/15/00

510-MW4

T.D.	S.W.L.	Diff.	2" Factor	1-vol.
15.0	8.10	6.90	.163	1

well Volume	pH	Temp.	wl cond. Cond.	Turb.*	DO mg/L
0	6.96	30.1 °C	2022 uS	-	2.4
1	6.95	29.8	2003	-	1.96
2	6.96	29.7	2018	-	1.48
3	6.91	29.6	2005	-	1.64
4	6.95	29.7	2016	-	1.84
5					

1301 Well Bailed dry. Will let recharge to sample (Mon 12/18)

* Unable to get turbidity reading due to batteries not being charged in meter.

Friday 12/15/00

up three missing boxes from earlier in the week.

1635 Arrive at TWFF decon area to prepare for Saturday.

1650 MKD & Glare with driller showed up. Kevin Cloe also showed. Called Lynn Pebbiban from work requesting more mailing labels.

1800 MKD, Glare, Kevin and Sarah are offsite.

1810 Drillers offsite for the day.

1820 I am waiting for Del to arrive - going to leave to go back to Palmas to see if he is there.

2015 I called Del's wife to see if his plane got off on time. She said he didn't call her saying otherwise.
* She wants him to call her as soon as he gets in.

2200 Del Brown called me from Ceiba Country Inn. He was at Gate 1 and then he was at Palmas Del Mar but apparently did not know our beach villa numbers.

12/15/00 (21) JCE

JCE

Friday ~~Saturday~~ 12/15/00

We will meet at the ~~gate~~ 1 office at 0630 Saturday (12/16/00). We will work out the details at that point. ~~I~~ JCE called MEK before Del did and said Del was waiting at front gate for me. MEK said ~~to~~ go get him but I did not have to as it turned out.

JCE 2039 Called MEK about Del & SWMV 9 for tomorrow.

Jon C. Edell Jr.

12/15/00 JCE (22) JCE

Saturday 12/16/00

0605 Arrive at Gate 3.

0645 Arrive at Gate 1 to meet Del.

0700 Arrive at TWFF decon area to get ready for the day. I received a phone call this morning from my sister-in-law in regards to my wife she fell has serious problems with her leg. I will need to get home. Will call MEK. Spoke with Del and crew.

0736 Going to fuels office to have gates for Tanks 212-215 and Tanks 216-217 opened. Nobody here. Going to Swmu 9 to see if gates are open.

0755 Flagging Sample locations of 95507, 95508, 95509.

0805 Called MEK to ask to leave early. His phone was not on!

0810 Called ab left a message on Jason Bridges voicemail about being back in the Swmu 9 area sampling.

Saturday 12/16/00

0840 Calibrating pH meter. 7.40 on a 7.00 standard. 4.06 on a 4.00 standard. 9.90 on a 10.00 standard.

0858 Go into Swmu 9 to sample.

0930 MEK called to discuss situation. He said go ahead and call USAIR to schedule a flight out. Sarah, Glare, and I left Swmu 9 to go to NEX exchange to buy minutes for phone and for me to call USAIR. I was able to schedule a flight for 1825 through Charlotte to Pittsburgh.

1015 Proceeding to TWFF decon area to discuss GPS with SARAH and Glare.

1045 SARAH, Glare, and I went to Swmu 3 to inform ~~MEK~~ JCE MKD about my intention. We exchanged information and Glare and I went to PALMAS DEL MAR.

1145 Arrived at Palmas Del Mar.

1315 Left Palmas for the airport. Gave Glare all info. I had for the trip along with keys.

1400 Arrived at airport (SAN Juan). Was able to get ~~an~~ a JCE ticket on Flight 1480.

* see Page 26

Sunday 12/17/00 JCE
~~Saturday 12/16/00~~

0330 Tried to call MKD and Baker crew from my home. A woman named Elva Cruz answered the phone saying that she found Baker's cellular phone on the ground at NSRR by Swmu 3. The woman said that she was going to do some christmas shopping and that ~~she~~ she JCE would try to run it out to the base. I explained that she would find Baker at TWFF decon area or around Swmu 3 area.

1520 I tried calling the woman again to see if she was able to get the phone to base. She said she gave it to Delbert Brown.

1330 I spoke with Del and MKD. Everything going well for Del, things (Locations) difficult for MKD and Baker crew at Swmu 9. MKD said Area C's gate is closed. MKD thought maybe Del could help the crew if he was finished with his work for the day. I thought that would be fine. * See page 27.

Saturday 12/16/00

1825 Flew to Charlotte from San Juan.
2115 Arrived at Charlotte Airport.
2240 Flew from Charlotte to Pittsburgh.
2350 Arrived in Pittsburgh.

Jon C. Eckel Jr.

Sunday 12/17/00

MKD said he did not need anything. I said I would call him tomorrow.

Jon C. Edel

Monday 12/18/00

1415 Called MKD to find out how everything is going. He said fine. He requested I do a FedEx track on a missing box sent Friday. That is all he said was needed to be done.

1430 Called FedEx. Got the process rolling on tracking the box. They said it left P.R., but they don't know from there. They are suppose to call me back.

1445 Called MKD back to let him know what FedEx had to say.

1930 Called FedEx back no word as of yet. They are still looking for package. They will call me back. I also spoke with them about packages that should have been received Saturday not Monday. She said they will look for package and we will go from there.

1945 Called and spoke with SARAH. Had her pass the message onto MKD about FedEx package. She said everything was going fine. She said turbidity

Monday 12/18/00

unit went out on them. A new one should be on its way.

2000 Called MEK.

2200 MEK called me we discussed field issues. He said a claim will have to be issued once the third package is found, I agree.

Jon C. Edell Jr.

Tuesday 12/19/00

0830 MKD calls me. We discuss issue of missing FedEx box. I explain what is going on. He said that all or part of 545510 and 545511 plus some groundwater quality for 510.MW1 was in the third cooler which is missing. MKD also said that OMAR will not be able to get a back hoe until Thursday at the earliest. JA Jones can provide one but only for this afternoon. He asked if GeoWorks could be onsite by themselves. I said MEK typically doesn't like that, we will need to confirm with MEK.

0845 Michelle Russo called. I filled her in with FedEx update. She discussed Driver information. She said MEK was going to call her back this morning.

1010 MKD called and said that 6 of the eight coolers sent yesterday were not received by ~~the~~ STL JCE

Tuesday 12/19/00

this morning. He is going to get me the MPS table for those as well.

1016 Spoke with Michelle Russo about FedEx packages again. She said that Michelle Owens said that she thinks at least 1 L amber was broken in the shipment they did receive.

1030 Spoke with MKD about FedEx problems. He said 2 1 Liter ambers were broken from the 2 boxes received at STL today. He said it should not be a problem quantity wise.

1111 Michelle Russo called. She said she spoke with Michelle from STL and Michelle O. said 2 ambers for 545W01 were broken. Michelle also said that the Baker crew has to be careful that what is in the COC matches what is in the cooler. Examples were 9SW19.

1120 Spoke with MKD about problems with COC and what is in cooler.

1250 MEK called and wanted to know the latest on the FedEx situation.

Tuesday 12/19/00

I explained all that I know. He wants me to have MKD fax chains back to Michelle. We then need to call the lab and data validator. He wants me to call FedEx back.

1315 MKD (I called) to ask him to fax COCs to Michelle Russo. He told me back hoe broke down for this afternoon. They will have all of SWMU 3 wells completed before they leave except for abandonment. He said they will have a problem with the abandon steel from the existing wells. They can't throw them in landfill. He gave a suggestion of a roll off but will not be able to get in one day. MKD said temps. in 2 of the 3 pckgs. received were fine according to Michelle Owens (STL).

1330 Michelle Russo called and I told her that MKD will be faxing info. on COCs to her.

1335 Called FedEx to find out what is going on. They still have not found

Tuesday 12/19/00

the Missing box from Friday 12/15 Shipment. They are doing a complete Search for it. I said I am under a Severe time restraint. I need to know ASAP. I asked about other shipment, she said the remaining 6 boxes didn't clear customs at the same time as the other two. They are in Memphis now. STL Should receive them by 10:30 Am tomorrow 12/20/00. The FedEx person said our claim can only be for the amount on the FedEx label.

1350 Called Michelle Russo to tell her to call Michelle Owens saying the 6 Missing coolers from today will be delivered by 1030 Am tomorrow 12/20.

1500 Spoke with MKD.

1510 Left a message with MEK.

2115 Left a message with MEK.

2130 Spoke with MEK about field work. I will keep him up to speed on issues. I will call field crew in morning.

Wednesday 12/20/00

0930 Spoke with Jim Culp. He said MKD and girls are at Swmw 9. He is working with drillers. They still have to abandon and develop, as well as IDW management.

0950 Spoke with Michelle Russo about the fieldwork and about FedEx.

1050 Spoke with MEK.

1115 MEK and I called FedEx.

1220 Finished call with FedEx. They will call us back.

1300 FedEx called requesting MEK's number. They also said that they are checking on missing box from yesterday.

1310 MEK and I spoke with FedEx again. Spoke with a guy named Tim. He is a manager that is looking into the situation.

1320 Spoke with MKD to see if he needed anything. He just said more time.

1337 Darlene Crawford from FedEx called to tell me that one of the packages from yesterdays shipment is in

Wednesday 12/20/00

memphis and will be delivered tomorrow 12/21 in the morning. Her reason was possible weather and high volume. I said it needs to get there tomorrow ASAP.

J.C. Edd Jr.

APPENDIX D.2
Field Notes from Sarah Wellar – Environmental Scientist

SAMPLING LOG

Wednesday 12/13/00

0715 - JE + SW on site @ SWMU 54 - gates are locked, but we are able to flag 4 locations outside of fenceline

0730 JE attempts to call PW for access to SWMU 54 - no one in yet

0745 JE + SW flag 4 locations outside of SWMU 54 WPS1 fenceline
- 545507
- 545506
- 545501
- 545515
- 545514

- Sampled 7 surface soil @ SWMU 54 + shipped w/ FedEx
- Sampled 1 more surface soil + put on ice for tomorrow.

- off site @

412-269-6000
John Malinowski
1500 Mt Baker Rd

John cell phone
787-415-4981

SWMU 9
- Biologically note
  - Birds
  - invertebrates

Fri 12/15

0900 At SWMU 54 to sample gw (GE + SW)

0905 Set up @ 510-MW1

0921 Calibrated DO meter @ 100

0922 DTW = 4.97

0927 Calibrate pH probe
4.09 - cal @ 4.01
7.48 @ 7 std
9.99 @ 10.01

0930 Calibrate Turbidity meter = 9.28

0940: Calibrate cond. meter
956 @ 1000 Std

0900 Called John Malinowski @ Pitt about SWMU #9 - He said to note any biological bird/plant etc that is in sight.

12/15/00
510-MW1

T.D	D.T.W.	Diff.	2" Factor (gal/ft)	1-vol. (gal)
13.0	4.97	8.03	.163	1.3

Vol.	pH	Temp. °C w/Cond.	Cond. uS	Turb. NTU	D.O. %
D	6.72	28.8	889	95.1	22.2
1	6.86	29.0	883	68.5	32.7
2	6.90	29.1	889	72.8	27.8
3	6.91	28.9	882	47.2	~~72.8~~ mg/L
4	6.84	29.1	889	84.0	2.40
5	6.87	29.0	862	–	1.91
6	6.84	29.0	885	–	2.81
					2.32

1014 - Turbidity meter batteries are not charged - could not get a reading for Vols 5+6. (the meter was shipped w/ low battery)

1020 Sampled 510-MW1
Sample was slightly turbid.

- NRE 244

Sat. 12/16/00

0830 At SWMU 9 area C to sample sed, surf H2O + surf soil

- sampled 095507 + D
see times in jars - 095508 + ms/msd
- 095509

0835 Calibrate cond. meter = 928 @ 1,000 std uS

1645 GS + SW to sample surface H2O @ SWMU 54 (2 trenches)

1650 Sampled 54SW01 + dup

1655 Sampled 54SW02

12/17/06

0730 SW, US, MD @ SWRU 9

0735 Calibrate cond. probe
= 963 @ 1,000 std

0746 Calibrate pH probe
9.09 @ 10 std.
~~8~~ 7.70 @ 7 std
4.6 @ 4 std.
(problems calibrating...)

845 Sampled 9SW20
+ 9SD20

0851 Readings @ 09SW19
Cond = 51.6 mS
Temp = 24.6 °C
pH = 7.17
DO = 49.3% mg/L
Turb = 32.8 NTU

1910 Sampled 9SD19
+SW19

0915 Took readings at 09SD18
- 09SW18

Cond = 25.29 mS
DO = 32.2% mg/L
pH = 7.18
temp = 24.6 °C
Turb = 94.6 NTU
slight sheen on water -
shallow area

0925 Sampled 09SD18 + dup
09SW18 + dup

1010 Took readings from 09SD17
+ 09SW17

Cond = 27.05 mS
DO = ~~X~~ 5.03 mg/L
pH = 7.33
temp = 30°C
Turb - 97

~1" of water in area

12/17/00

1240 Took readings @ 095W16
Cond = 51.7 mS
pH = 7.25 SU
Temp = 30.6°C
DO = 4.8 mg/L
Turb = (1) 2.1 NTU
(1) Meter got wet not reading correctly
will recalibrate this pm.

1250 Sampled 095W16 + ms/msd
+ 095D16

1300 Took Readings @ 095W15
Cond = 51.7 mS
pH = 7.13 SU
Temp = 33.3°C
DO = 5.83 mg/L
Turb = 1.6 NTU (not reading correctly - wet)

12/17/00

1310 Took readings at 095W14
Cond = 52.2 mS
pH = 7.35
Temp = 33.9°C
DO = 4.62 mg/L
Turb = 4.53 (?) NTU

1320 Sampled 095D15
+ 095W15

1335 Sampled 095D14
+ 095W14

1345 Took readings @ 095W13
Cond 65.8 mS
pH 6.76
Temp 28.3°C
DO = 0.46 mg/L
TURB —

12/17/00

1430 Took readings @ 9SW/SD 21
Cond = 51.4 mS
pH = 7.96 su
Temp = 31.8 °C
D.O. = 9.27 mg/L
Turb = —

1430 Sampled 9SD/SW21

1435 Took readings @ 9SD/SW22
Cond. 51.4 mS
pH = 7.97
temp = 31.8 °C
DO = 9.02 mg/L
Turb = —

1440 Took readings @ 9SD/SW23
Cond = 51.1 mS
pH = 8.02 su
Temp = 31.6 °C
DO = 9.82 mg/L
Turb = —

Mon 12/18

0720 GS + SW set up to sample 510-MW41 (MDJ purged last night)
- WL = 11.5
will wait to sample til this pm so it won't bail dry

0735 Set up @ 510-DW1
DTW =

Calibrate Conductivity meter
= 949 @ 1.000 std

Calibrate pH
= 4.64 @ 4.01 std
= 7.47 @ 7.00 std
= 10.49 @ 10.01 std

Calibrate DO (Salinity = 10 alt = 0)
= 100.00

12/18/00
Calibrate turb. meter - Not working!

DTW = 10.75
DTB = 25.2 Diff = 14.45 2" factor .163
= 2.35 (1 vol) gallons

Vol	pH	(pH) temp °C	Cond	DO	Turb
0	7.26	27.1	896uS	0.87 mg/L	-
1	7.20	27.5	826	1.16 mg/L	-
2	7.23	27.9	818uS	1.89 mg/L	-
3	7.17	27.0	793uS	1.84 mg/L	-
4	7.14	27.9	801uS	1.74 mg/L	-
5	7.20	27.6	798uS	1.84 mg/L	-

- Water looks clear -

0840 Sampled well 510-DW1

3.37 l/gall

12/18/00
0650 Set up @ 510-DW2

DTW = 10.75
DTB = 45
diff = 34.25 2" factor = .163
5.5 gal = 1 vol.

Vol	pH	(cond) temp °C	Cond	DO mg/L	Turb
0	6.96	28.8	1028uS	1.75	-
1	7.01	29.1	996uS	2.36	
2	6.94	28.9	975uS	1.55	
3	6.86	29.1	992uS	1.73	
4	6.91	29.2	979uS	2.30	
5	6.84	29.2	987	1.81	

Water appears clear

1005 Sampled well 510-DW2

1010 Sampled 510-MW4

water appears clear

12/18/00

Ask Mark:
- call Fed Ex
- bailers in wells?
- well dry?
- ~~get more coolers for GW~~
- DVM
- turb. meter

1040 - Set up @ 510-MW3

DTW = 11.1
DTB = ~~15~~ 17.4
diff = ~~3.9~~ 6.4 1.0 = 1 well vol.
2" well = .163 = ~~1.35~~ gal.

Vol	pH	temp °C	Cond uS	DO mg/L	Turb
0	6.93	28.3	1207	1.53	—
1	6.89	28.5	1217	1.35	—
2	6.84	28.4	1220	1.77	
3	6.82	28.4	1174	1.62	
4	6.80	28.2	1134	1.75	
5	6.76	28.3	1142	1.64	

1130 Sampled well
Water appears clear

12/19/00

0735 GS + SW set up @
510-MW2
Calibrate DO =
Calibrate pH = 4.62 @ 4, 7.02 @ 7, 10.01 @ 10
Calibrate Cond = 949 @ 1,000 std
DTW = 15.64
DTB = 22.09
diff = 6.45 x .163 = 1.05
1 gal = 1 volume

Vol	pH	temp °C (cond)	Cond (uS)	DO (mg/L)	Turb
0	7.00	27.1	1526	1.35	—
1	7.02	27.3	1233	1.46	—
2.	7.01	27.4	1519	1.29	—
3.	7.00	27.4	1532	1.41	
4.	7.03	27.4	1538	1.61	

0905 Sampled well
- water is slightly turbid

12/19/00

0940 Set up @ 54TW02

DTW 11.09

DTB 20.0'

diff = 8.91 x .163 = 1.45

Vol	pH	(cond) temp °C	Cond uS	DO mg/L
0	6.41	30.1	1069	1.60
1/2	6.28	30.3	1072	1.56
1	6.26	30.1	1067	1.79
2	6.26	30.3	1068	1.53
2 1/2	6.27	30.3	1070	1.53
3	6.26	30.2	1071	1.68

water is full of sediments / fine-brown in color

1005 Sampled well 54TW02

1025 Set up @ 54TW01

DTW = 11.8

DTB = 20

diff = 8.2 x .163 = 1.33

12/19/00

Vol	pH	temp (°C)	Cond (µS)	DO (mg/L)
0	6.48	29.1	1477	2.00
1/2	6.62	29.1	1424	4.04
1	6.58	29.3	1451	3.83

1045 well bailed dry

1400

collected gw quality samples from 510-MW02 (4 jars) because we could not locate 510-MW05 + could not get from MW04 b/c it was bailing dry.

1800 - Sampled 54TW01

12/20/00

0700 Finish sampling 54TW01

remove all bailers from wells, seal IDW drums

0739 Calibrate DO meter
@ 0 Altitude
20 ppt Salinity
= 120.2 % or
8.90 mg/L

0740 Calibrate Cond. meter
= 435 uS @ 1,000 std.

0743 Calibrate pH meter
= 4.93 @ 4 std
= 6.94 @ 7 std
= 9.91 @ 10 std.

0839 Took Readings @ 9SD12
pH = 7.5 SU
temp = 25.4°C
Cond = 46.7 mS
DO = 3.02 mg/L
TVB = 196 NTU

0840

0848 Took Readings @ 9SD11
pH = 7.13
temp = 24.8°C
Cond. = 48.4 mS
DO = 3.15 mg/L
TVB = 87.9 NTU

0903 Took Readings @ 9SD10
pH = 7.15 SU
temp = 24.9°C
Cond = 48.2 mS
DO = 2.5 mg/L
TVB = 72.5 NTU

0930 Took readings @ 9SD09
pH = 7.12
temp = 25.3°C
Cond = 48.9 mS
DO = 1.70 mg/L
Turb = 124.5 NTU

0946 Took Readings @ 9SD08
pH = 7.10 SU
temp = 28 °C
Cond = 47.3 mS
DO = 4.5 mg/L
Turb = 83.8 NTU

1118 Took readings @ 9SD27
pH = 7.26
temp = 29.0 °C
Cond. 43.5 mS
DO = 9.83 mg/L
Turb = 28.5 NTU

gw quality for NW2 is in 2 coolers (ms & msa) w/ wrong label!

1125 Took readings @ 9SD26
pH : 7.5 SU
temp : 31.0°C
Cond : 45.7 mS
DO : 11.5 mg/L
Turb : 20.5 NTU

1130 Took readings @ 9SD25
pH : 7.57 SU
Temp : 30.5°C
Cond : 44.6 mS
DO : 9.2 mg/L
Turb : 11.5 NTU

1140 Took readings @ 9SD24

pH : 8.11 SU

Temp : 32.7°C

Cond : 45.9 mS

DO : 11.20

Turb : 12.7 NTU

1205 Took readings @ 9SD28

pH - 7.76

temp = 30.8°C

Cond = 44.3 mS

DO = 12.3

Turb - 10.9 NTU

1430 Resample 9SSSID + 11 + 510-MW1 for coln (FedEx didn't ship cooler)

12/21

0700 Set up @ 510-MW5
DTW = 13.15
DTB = 20
Wf ~ 0.85 x .163 = 1.1

Vol	pH	temp	Cond	DO	turb
0	7.12	27.5	1797	1.50	7.64
1	7.08	28.1	1800	1.45	28.2
1½	7.09	28.1	1769	1.60	29.8
2	7.09	28.3	1808	2.18	36.5
2⅓	7.10	28.0	1810	1.45	35.5
3	7.09	28.4	1820	1.62	38.5

0 Sampled well
510-MW5

0830 Sampled 2000FB02 w/ Stone
bought DI.

0845 Sampled 54EB02 w/ Spect spoon

APPENDIX D.3

Field Notes from Mark DeJohn–Field Geologist/Site Manager

CTO-099

Monday Dec. 11, 2000. Today's Tasks -
Mobilize for SWMU 53/54
Investigation & Well Installation at
SWMU 3.

0711 Depart for PIT. Travel to
Puerto Rico (EST)

1410 Arrive at San Juan airport. Will
Get rental vehicles, obtain base
passes, & check in at Palmas
Del Mar. (AST)

MKD

12/11 MKD

Tuesday Dec. 12, 2000. Todays Tasks-
setup ; SWMU 53 work
Weather Conditions-
AM: P. Sunny, windy, ; mid 70's
PM: P. Sunny, breezy, ; low 80's

0630 Arrive at NSRR. Go to Public works for supplies

0716 Relocate (MKD) to TWFF to check on drillers

0730 Drillers not on site yet. Prep. for the day's tasks

0817 SEW ; I relocate to SWMU 53 to locate borings ; sample locations per Work Plan map.

0828 Cannot locate borings until some clearing is done. Will now wait on driller

0951 JCE ; G S back on base from supply pickup. Still waiting on driller.

1040 Got access to TWFF decon area. Omar Negron said drill crew is on their way (in Ceiba)

1130 GeoWorks (Driller on-site). They begin off-load ; setup

1220 Baker crew and GeoWorks tours the sites (SWMUs 3, 53, ; 54). Other GeoWorks crew begins decon.

1316 Couldn't get access to SWMU 3 at this time w/o safety equip (active work zone). We must coordinate future access w/ construction office. Should not be a problem though. Wells GW02 ; GW04 are in const. area. Others are fine.

1321 Return to TWFF area. Driller moved rig to Bundy area to pull augers left from another CH2MHill job.

1433 I go with Hermineo ; GeoWorks to look at replacement wells GW01, GW02, ; GW04.

1502 Return to TWFF decon. area. GeoWorks still setting up for decon. I assist with bottle organization.

CTO-099

1558 Herminio has arranged for JA Jones to clear at SWMU 53. ~~In the m~~ MKO while clearing occurs Geoworks will begin well replacement at SWMU 3.

1700 GeoWorks finished for the day - depart NSRR - TWFF. Baker crew still organizing bottles & equipment.

1756 Baker crew depart NSRR - Finished for the day. Note that little work GeoWorks did today can be charged to project - incl. auger pull at Bundy area & decon time from Vieques Is work.

Mark K 12/12/00

MKO 12/12

CTO-099

Wed. Dec. 13, 2000. Todays tasks - Clear SWMU 53. Drill @ SWMUs 3 & 53.

Weather Conditions -
AM: M. Sunny, windy, & mid-70's
PM: M. Sunny, windy, & low 80's

0635 Baker Crew arrives @ TWFF GS & I will meet Herminio regarding clearing brush @ SWMU 53.

0712 Herminio not in yet.

0729 Relocate to R7GW08 to setup for replacement well.

0744 GS & I return to public works to meet Herminio. He is meeting w/ JA Jones right now regarding brush clearing at SWMU 53. We also need to discuss utility clearance at R7GW08.

0907 MEK said we should be fine at R7GW08 as long as we are close to original well. Herminio could not locate utility guy to clear SWMU 3.

12/13 MKO

0914 Prepare to auger at R7GW12.
0924 Begin drilling at R7GW12. Note GeoWorks using 3"-OD split spoons.
0938 GS said that R. Colon approved drilling along road as long as we remain near original well & keep same distance off road. He will write letter
1024 Electric Co. rep. saw our proximity to electric line (overhead). Asked that we not be so close. Should coordinate other w/him for other wells near line (thru. R. Colon)
1034 Auger to 15' to set well.
1102 Begin Well installation
1111 Driller lunchbreak. I locate borings at SWMU 53.
1135 Complete boring and surface soil locating. Herminio stopped by to check clearing work. I take a lunchbreak
1220 Return to SWM 3. Drill crew not back on site yet.

MKD 12/13

1251 GeoWorks returns to R7GW12 location.
1318 Well completed to bentonite seal
1410 Begin boring 53-SB05.
1442 Encountered hard rock at about 5-ft bgs. Will attempt to auger to 6' bgs & collect sample
1523 Relocate to SB06. GS collects 53-SB06-00. Note that hard rock was encountered at 5-6 ft bgs. I decided not to proceed to water table because rock will be a downward migration barrier in the absence of fractures. Further it is improbable to drill at (vertical) fracture zones by arbitrary selection of boring locations.
1529 Begin boring 53-SB06
1614 Complete boring. I will give health & safety briefing.
1645 GeoWorks depart SWMU 53 to drum soil cuttings @ R7GW12.

12/13 MKD

CTO-099

GW12 Replaces R7GW08

TIME	ID	Depth (Ft)	Recovery (Ft)	Blow Counts	PID PS/BG
0928	S-1	0-2	1.5	21-45-39-29	1.6/1.2
0940	S-2	2-4	1.9	30-25-20-18	0.0/0.0
0947	S-3	4-6	1.6	27-17-15-10	0.0/0.0
0954	S-4	6-8	2.0	10-12-12-10	5.9/0.0
1002	S-5	8-10	2.0	8-7-5-11	0.0/0.0
1027	S-6	10-12	1.0	3-4-9-11	0.0/0.0
1030	S-7	12-14	1.4	5-11-5-6	0.0/0.0

BOHC 14'

Note: used 3" spoons @ S-1 - S-5
used 2" spoons @ S-6 ; S-7
4'/4' HSAs used (and will use throughout project.

MKD 12/13

Rig: Mobile B-61

Description

F/M SAND, some gravel ; cobbles; v. dense; dry (FILL) 2.0'

F/C SAND, some coral fragments, trace silt shell fragments; dense; damp

F SAND, trace coral frag ; silt; ~~tra~~ strat. appearance; tan; ~~M~~ dense; damp (Beach deposits)

As above, but moist (no odor or staining) w/ trace clay stringers ; m dense

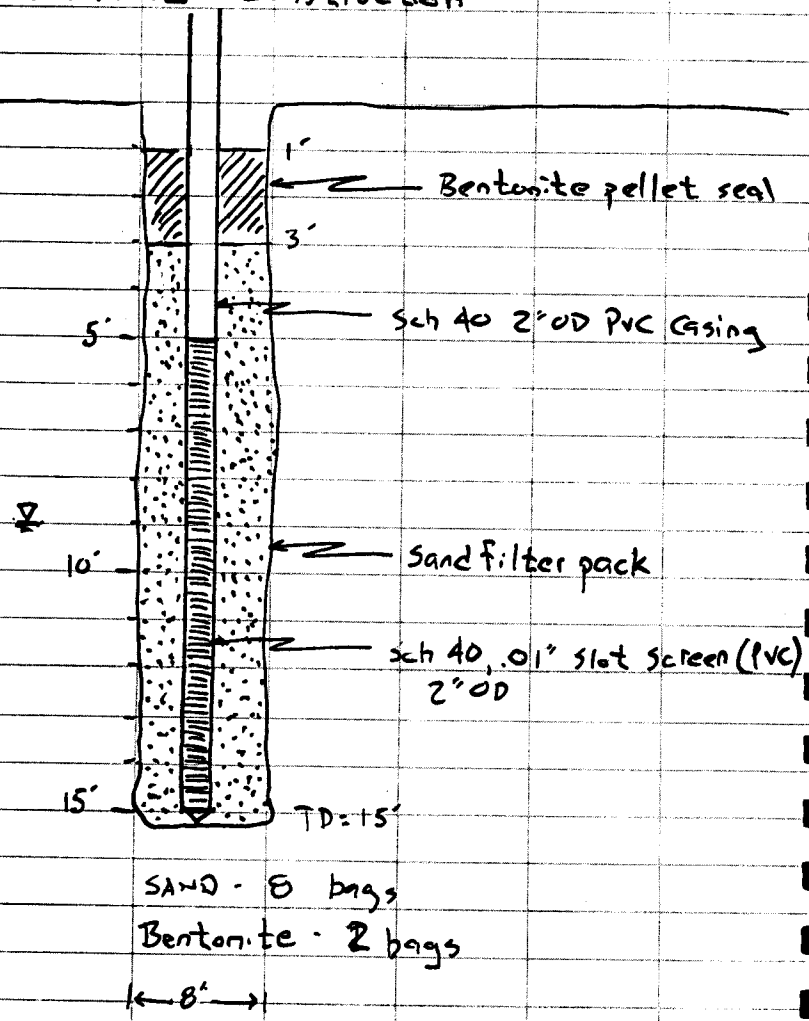
F SAND, some small shell frag, trace silt; gray; m. dense; wet
WATER @ 9.0'

As above

F SAND, trace shell frag. ; silt; gray; wet; m. dense

12/13 MKD

R7GW12 Construction



SAND - 8 bags
Bentonite - 2 bags

MKD 12/13

1645	GSI I collect surface soil samples at SWMU 53.
1710	MEK, DJ & KC on site
1730	Relocate to TWFF-drop off samples
1800	Depart NSRR-done for the day.

12/13 MKD

CTO-099

53-SB05

Time	ID	Depth (ft)	Blow Counts	Recovery (PID)	PID PS/BG.
1410	S-0	0-1	–	–	–
53-SB05-00					
1413	S-1	0-2	10-10-10-17	0.9	0.0/0.0
1418	S-2	2-4	9-10-12-14	1.0	0.0/0.0
53SB05-02					
1425	S-3	4-6	8-15 55/5"	0.4	0.0/0.0
1449	S-4	6-8	32-50/4"	0.5	0.0/0.0
1503	Auger refusal @ 5.5'				
	BOH @ 6.4'				

MKD 12/13

Rig: B-61 Spoons: 2" OD

Description

GS collects surface soil sample

ROCK FRAG, some silt, trace brick frag; gray; stiff; dry — 2.0

Weathered BEDROCK; brown; v. stiff; dry

As above; greenish-gray; hard; damp

As above

12/13 MKD

CTO-099

53-SB06

Time	ID	Depth (Ft)	Blow Counts	Recovery (ft)	PID PS/BG	Description
1530	S-1	0-2	11-15 17-19	1.0	0.0/0.0	Rock FRAG, some silt; gray; dense; dry 2.0
1539	S-2	2-4	17-13-13-17	0.4	0.0/0.0	Weathered BEDROCK; mottled red-brown; gray; ~~dense~~ v. stiff; damp
1544	S-3	4-6	14-14-15-17	0.7	0.0/0.0	As above, but brown; greenish-gray; v. stiff
53-SB06-03						
1552	S-4	6-8	23-23 27-31	1.5	0.0/0.0	As above (4-6'), but hard
1604	S-5	8-~~10~~ 8.5	47-57/5"	0.9	0.0/0.0	As above
	BOH@	8.5'				

MKD 12/13

CTO-099

Mark D. Roff 12/13/00

12/13 MKD

CTO-099

Thurs. Dec. 14, 2000. Todays Tasks
SWMU 53 Borings
Weather Conditions -
AM: M. Sunny, Sl. breezy & mid 70's
PM: M. Sunny, breezy & low 80's

0645 Arrive at Gate 3. I'm told I need another pass & must go to Gate 1
0703 Arrive a Gate 1
0719 Arrive at TWFF. Prep for the day. GeoWorks on Site. Wait for heavy rains to pass.
0739 Relocate to SWMU 53
0756 Setup at 53SB04
0800 SEW collects surface soil sample 53SB04-00 & 00D. Note all samples collected for App IX metals & Pest/PCBs
0811 Begin boring 53SB04
0853 Boring 53SB04 complete. Relocate to 53SB03
0915 SEW collects surf. soil sample 53SB03-00
0922 Begin boring 53SB03.
0948 Complete boring relocate to

MKO 12/14

CTO-099

(cont.) boring 53SB02
1000 SEW collects surf. soil sample 53SB02-00, 00D, & 00 MS/MSD
1026 Complete boring. Relocate to boring 53-SB01
1033 SEW collects surf. soil 53SB01-00
1038 Begin boring 53SB01
1110 Complete borings @ SWMU 53. Cleanup.
1132 Geoworks breaks for lunch. SEW & I relocate to TWFF
1140 SEW & I break for lunch
1221 Return to TWFF.
1235 Collect 53ER01 from stainless steel spoon PCB/Pest & A9 Metals
1250 Geoworks returns to TWFF
1255 I collect 53ER02 from stainless steel split-spoon.
1308 Relocate to SWMU 3.
1315 Setup next to R7GW07. Will install R7GW13
1320 Note: SEW to assist JCE, so I go to SWMU 3. Note on SWMU 53: MEK moved location of 53SB01

12/14 MKO

CTO-099

535B04

Time	ID	Depth (Ft)	Blow Counts	Recovery (Ft)	PID Ps/BG
0816	S-1	0-2	7-14-27-9	1.0	0.0/0.0 15/0.0
0822	S-2	2-4	17-14-17-35	0.9	(a)
0833	S-3	4-5.5	31-37-50/4"	0.9	30/0.0
535B04-02					
0841	S-4	5.5-6	62/5"	0.4	0.0/0.0
	BOH@ 6.0'				

(cont.) 20-30' further from planned location (further from Bldg 64).

1324 Begin boring for ~~MW~~ TGW13

1430 Begin well installation

1439 Herminio on site.

1456 Complete well to bentonite seal

1502 Geoworks relocate to decon pad. to decon augers. I go to Herminio's office to discuss well abandonment.

1600 Geoworks ~~pe~~ departs TWFF - done for the day.

MKD 12/14

CTO-099

Rig: B-61 / Spoon: 2" OD

Description	
ROCK FRAG, some silt, trace clay; hard; dry	3.0
Weathered BEDROCK; greenish-gray, gray; tan-mottled; hard; damp	
As above; mottled brown; gray; hard; damp	
As above; mottled dk brown; hard; damp	

(cont.) Discussion w/ Herminio & KC yielded the following:

- landfill may be closed on weekend. We may not be able to drill there
- KC & MEK noted an oil/water separator in Area C that discharges to Mangrove. KC feels that would be a good "worstcase" sampling point.

12/14 MKD

CTO-099

53SB03

Time	ID	Depth (Ft)	Blow Counts	Recovery (Ft)	PID PS/BG
0923	S-1	0-2	5-7-14-23	1.1	0.0/0.0
53SB03-01			0.0		
0933	S-2	2-3.6	~~22-40~~ ~~49-25~~	22-47-49-56/3"	0.0/0.0
0939	S-3	4-4.5	0.0	64/5"	~

BOH @ 4.5'

MKD 12/14

Description

ROCK FRAG; SILT, some clay; brown; gray; moist; v. stiff 1.0

Weathered BEDROCK; orangish-brown; greenish-gray; hard; damp

No recovery

12/14 MKD

CTO-099

535B02

Time	ID	Depth (Ft)	Blow Counts	Recovery (Ft)	PID PS/BG	Description
1009	S-1	0-2	3-4-4-16	0.5	0.0/0.0	ROCK FRAG, some silt; clay; dk brown; stiff; moist
1014	S-2	2-4	20-50-50-54/3"	0.6	0.0/0.0	Weathered BEDROCK; m. brown; hard; dry
535B02-02						
1020	S-3	4-4.6	50-60/2"	0.3	0.0/0.0	

BOH@ 4.6'

MKD 12/14

1.9

12/14 MKD

CTO-099

53-SB01

Time	ID	Depth (Ft)	Blow counts	Recovery (Ft)	PID PS/BG	Description
1039	S-1	0-2	7-6-6-7	0.8	0.0/0.0	SILT, little clay; f gravel; brown; moist; stiff 1.0
1042	S-2	2-4	6-7-9-16	0.9	0.0/0.0	Weathered BEDROCK; gray (mottled); stiff; damp, then tan (@ 2'↓)
1045	S-3	4-6	20-21-22-32	1.4	0.0/0.0	Same as 2-4'
535B01-03						
1053	S-4	6-8	30-40-45-53/3"	1.5	0.0/0.0	Same, but orangish tan (mottled); v. frac vert fractures filled (black); hard; damp
1110	S-5	8-10	55-45-45-55/5"	1.3	0.0/0.0	Same as (6-8), but orangish-brown; gray
535B01-05						

BOH @ 10.0'

MKD 12/14

CTO-099

12/14 MKD

CTO-099

R7GW13 Replaces R7GW07

Time	ID	Depth (Ft)	Blow Counts	Recovery (Ft)	PID PS/BG
1325	S-1	0-2	3-3-5-7	1.0	0.0/0.0
1327	S-2	2-4	6-6-4-5	1.1	0.0/0.0
1330	S-3	4-6	5-7-6-5	1.3	0.0/0.0
1334	S-4	6-8	5-5-5-5	1.0	0.0/0.0
1339	S-5	8-10	3-9-13-17	1.0	0.0/0.0
1355	S-6	10-12	6-7-9-5	1.0	0.0/0.0
1358	S-7	12-14	5-4-2-1	1.4	0.0/0.0
1400	S-8	14-16	1-1-1-1	1.4	0.0/0.0
1411	A-N	16-18	-	-	-

MKD 12/14

CTO-099

Description

SILT, some f roots gravel, trace shell frag.; gray; loose; dry

F SAND, little coral frag.; trace < sand (shell frag); tan; loose; damp

Same as above

SILT, trace f/m sand (shell frag); tan; m. dense; damp

F/C sand, little coral; shell frag; silt; tan; m. dense; wet

WATER @ 11.0'

13.4'

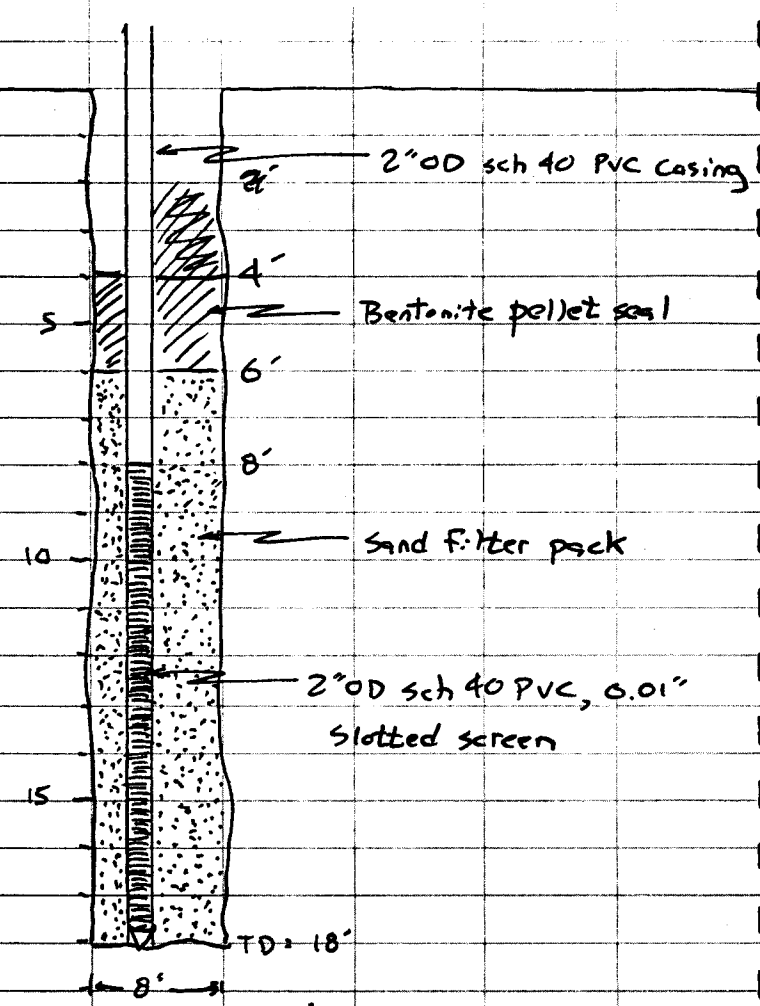
SILT, becoming ~2" ~~more clay~~ SILT, some clay, trace < sand; gray; wet becoming moist; soft

H_2SO_4 odor at top

12/14 MKD

CTO-099

7GW13 Construction Detail



sand - 10 bags
bentonite 2 bags

MKD 12/14

CTO-099

1418 Arrive at SWMU 54 after departing TWFF @ 1407. Discuss events w/ JCE.

1630 I will assist JCE & SEW w/ surf. soil sampling @ SWMU 54.

1641 I begin collection of sample 545504 MKD & 04D

1706 I begin collection of sample 545508

1732 I relocate to TWFF. JCE & SEW to follow.

1758 Depart TWFF. All done for the day.

Mark K Dale 12/14/00

12/14 MKD

CTO-099

Friday Dec. 15, 2000. Today's Tasks-
SWMU 54 TWs & SB installation
Weather Conditions
AM: M. Sunny, sl. breezy, & mid-70's
PM: M. Sunny, sl. breezy & mid 80's

0645 Arrive at TWFF. Prep. for the days tasks.

0718 I visit landfill contractor to discuss weekend operation schedule

0747 Relocate to SWMU 54. Setup at 54TW02

0822 Begin boring for 54TW02

0840 Kevin Cloe on site. O_2 = 20.9 (LEL=0%

0842 Kevin off site. Note that JCE & SEW are on site sampling monitoring wells.

1047 54TW02 installed to 18' bgs. Begin auger pull

1130 lunchbreak

1214 Return to SWMU 54

1236 Geoworks returns to SWMU 54

1252 Begin boring for 54TW01

1315 Rig down due to problem with split spoon sampler.

1340 Continue drilling

MKD 12/15

CTO-099

1420 General notes:
- Can work on landfill if we arrange w/ ROICC & pay for time of contractor
Probably not enough time to arrange.
- Geoworks added another crew member. I don't believe we requested it.

1423 We encounted very hard clay at both borings today. The drilling has slowed down accordingly.

1544 Auger at SB01 to 20' bgs. Will install temp well w/ 10' screen (10-20') & 10' of casing (2" OD PVC, Sch 40, 10-slot screen).

1550 Collected 54SB01-08

1600 Collected 54SB01-08. Geoworks pulls augers.

1608 KC on site around 1400. Madeline & Herminio on site around 1500

1614 Geoworks relocate to TWFF. KC & GS & I to follow.

1630 Arrive at TWFF. Geoworks prep. to decon.

12/15 MKD

CTO-099

54TW02 (54SB02)

Time	ID	Depth (Ft)	Blow counts	Recovery (Ft)	PID PS/BG
0825	S-1	0-2	15-24-18-10	1.8	0.0/0.0
0837	S-2	2-4	8-17-22-19	1.3	26/0.0
54SB02-02					
0844	S-3	4-6	11-16-22-22	1.3	0.0/0.0
0859	S-4	6-8	12-18-19-22	1.2	6.5/0.0
0950	S-5	8-10	5-10-9-10	1.7	0.0/0.0
54SB02-06					
0953	S-6	10-12	8-6-5-5	1.8	0.0/0.0
O_2 - 21.2% / LEL - 0%					
1001	S-7	12-14	5-5-6-6	2.0	0.0/0.0
1025	S-8	14-16	1-2-4-4	2.0	0.0/0.0
1035	A-N	16-18	-	-	-

Set TW @ 18.8' bgs (same specs as SWMU3)

MKD 12/15

Rig - B-61
Spoons - 3" OD

Description

F SAND, some silt; f/c gravel; cinders; dk brown; black, tr. green staining (Fuel?); dense; damp (FILL) 2.0

2-4 CLAY, little silt; orange; red browns; mottled; hard; damp (NATURAL)

Same-mottled red; gray; hard; damp

Same as 4-6' 21% O_2 0% LEL

CLAY, little silt, trace c sand; orangish/brown; yellowish brown (mottled) w/ gray filled vertical fractures; stiff damp (moist @ 10-12)

As above, but water @ 13.4'

Same as 8-12'; m. stiff; damp water in a narrow zone ~13-14'

12/15 MKD

CTO-099

54TW01 (54SB01)

Time	ID	Depth (Ft)	Blow Counts	Recovery (Ft)	PID PS/BG
1256	S-1	0-2	20-31-32-19	1.9	0.0/0.0
54SB01-00					
1309	S-2	2-4	13-13-21-21	1.5	0.0/0.0
1315	S-3	4-6	18-25-31-33	1.6	0.0/0.0
1345	S-4	6-8	33-29-48-47	1.9	0.0/0.0
1433	S-5	8-10	5-9-13-15	1.7	0.0/0.0
54SB01-05					
1440	S-6	10-12	19-9-9-9	2.0	0.0/0.0
1502	S-7	12-14	2-4-5-6	2.0	0.0/0.0
1508	S-8	14-16	6-8-13-21	2.0	0.0/0.0
54SB01-08					
1525	S-9	16-18	6-8-10-9	2.0	0.0/0.0
	A-N	18-20	—	—	—

MKD 12/15

CTO-099

Spoons - 3" OD

Description

SILT, some f/c gravel, trace clay; black, dk brown; v. dense; damp

CLAY, little silt, trace c. sand; dk yellowish-brown; hard; damp

CLAY, little silt; reddish-brown; gray-mottled; hard; damp

SILT, some clay, trace f gravel; rust; yellowish brn; mottled; hard; damp

CLAY, little silt, trace f gravel; mottled yellow/brn, rust; gray; v. stiff; damp — O_2 - 21% LEL - 0%

SILT, little to some clay (varies w/depth) rust, gray; yell-brn; v. stiff; damp

SILT, little clay; yell-brn; gray; damp (moist @ 13.5'); stiff — O_2 - 20.9% LEL - 0%

As above w/ wet sediments @ ~ 15.5'

wet @ 16-17'

17.3'

SILT, tr clay; orange-brn, tan w/ gray vert fracture; pink mottled; v. stiff; damp

12/15 MKD

CTO-099

1748 Geoworks could not decon much MKD problems w/ steam cleaner. Prep. for tomorrow in other ways.

1800 Depart TWFF. Done for the day.

MKD 12/15

CTO-099

Sat. Dec. 16, 2000. Today's Tasks-
SWMU 3 Well installation
Weather Conditions-
AM: Var. Clouds, breezy, & mid 70's
PM: M. Sunny

0635 Arrive at NSRR. Meet DB at Gate 1

0651 Arrive at TWFF. Prep. for the days tasks. DB to begin survey. JCE, GS, & SEW to sample at SWMU 9.

0745 Geoworks on site. Completing decon from what was started yesterday.

0834 Geoworks & I relocate to SWMU 3.

0843 Setup at R7GW05. Periods of rain this morning, which are now impacting operations now.

0917 Begin boring for 7GW14

1055 Begin well installation

MKD

1145 I instructed Geoworks to pull well and start over due to 2-3' of sediment. Geoworks will redrill to 25' and

12/16 MKD

CTO-099

7GW14 Replaces R7GW05

Time	ID	Depth (Ft)	Blow Counts	Recovery (Ft)	PID PS/BG
0919	S-1	0-2	2-4-22-24	1.0	0.0/0.0
0926	S-2	2-4	22-16-13-11	1.2	0.0/0.0
0928	S-3	4-6	11-11-5-4	1.3	0.0/0.0
0931	S-4	6-8	3-4-5-4	1.0	0.0/0.0
0940	S-5	8-10	2-2-4-3	0.6	0.0/0.0
0959	S-6	10-12	4-4-4-4	1.2	0.0/0.0
1003	S-7	12-14	4-5-7-8	1.2	0.0/0.0
1005	S-8	14-16	6-7-4-5	1.4	0.0/0.0
1034	S-9	16-18	2-2-1-2	1.2	-
1047	A-N	18-20	-	-	-

MKD 12/16

CTO-099

Rig: B-61 Spoons - 2" OD

Description

ROCK FRAG, some silt, trace f/c sand; gray; M. dense; dry

As above, but finer rocks; buff; M. dense; dry (FILL)

5.7'

F SAND, little silt, f gravel, trace m/c sand; olive drab; M. dense; damp

6.0'

SILT, trace clay; olive drab; gray thin laminae; stiff; damp

8.0

F SAND (as shell frag), trace silt; dk brown then gray; loose; damp

As above; buff; loose; damp

As above wet - WATER @ 13.5'

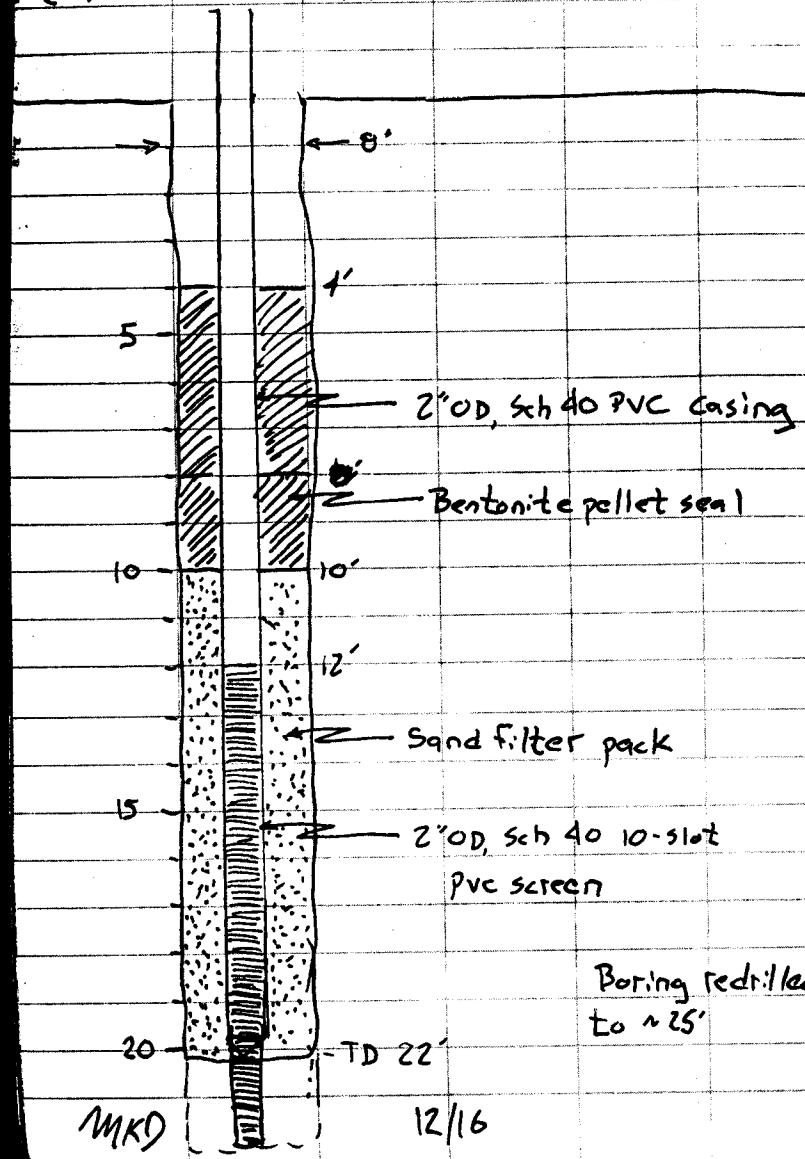
As above w/ little black c gravel @ 15.5-16'

As above

12/16 MKD

CTO-099

TGW14 Construction Details



MKD 12/16

CTO-099

(cont.) and set well again to 20' bgs.

1100 [late entry] JCE informed me that he was going to go home today to attend a family emergency. GS will drive him to the airport, the return to NSRR. I will now act as site manager. We discussed some transition issues. SEW remains with me.

1315 SEW & I get lunch & ice for samples

1350 Drillers complete well. Take lunch break & pickup supplies for building pads.

1522 Geoworks not on site yet. SEW & I are preparing for other sampling tasks.

1535 GS back on-site. Geoworks preparing to build pads.

1559 GS & SEW to sample surface water at SWMU 54.

1729 Relocate to TWFF. Geowork done for the day. GS & SEW also return to TWFF

12/16 MKD

CTO-099

1733 SEW & GS collected the surface water samples @ SWMU 54. We all now label bottles.

1807 Done for the day- Depart TWFF

MKD 12/16/00

MKD 12/16

CTO-099

Sunday Dec. 17, 2000. Today's Task- SWMU 9 SW/SD Sampling

Weather Conditions-

AM: M. Sunny breezy, & mid 70's

PM: M. Sunny/MKD breezy, & mid 80's

0636 Arrive at ~~SWMU 9~~ TWFF. Prep for sampling w/GS & SEW.

0709 Fuels office personnel open gate to Areas A & B

0830 Head for Mangrove swamp

1053 Collected Area B samples. Also collected SW/SD 17 in Area A. The samples 16-13 (SW of SD 17) are in mud flat w/ little to no water.

1153 Talked to MEK about SW sampling MEK wants to collect samples, even if we go further into bay

1326 There is no sediment/surface water downgradient of Area A - open field (Gen. P. AREAA). Points (Gen. P. 1, 2, & 3) define edge of Mangrove & water (see map [separate doc.])

12/17 MKD

CTO-099

1500 Collected Areas A & B SW/SD samples

1519 Relocate to fuel office to open Area C, but personnel gone for the day.

1627 Explored Background SW/SD sampling locations. Some clear will be required to get to the water. I prep. for Pest/PCB wipe sampling

1700 Collected 53WP01

1710 Collected 53WP02

1715 Collected 53WP03

1720 Collected 53WP04

1728 Relocate back to TWFF. Note: I located samples from walls & marked on "sample pack" drawing. Also, marked on floor

1735 Relocate to SWMU 54 to repurge 510-MW04

1751 DTW = 10.11' (T/PVC)

1804 Well bailed dry. Cleanup & relocate to TWFF.

1815 I called MEK. It has become apparent that we need the third

MKD 12/17

CTO-099

(cont.) person to keep schedule (and not extent into Fri/Sat) MEK will look into getting Pete Henderson or Pete Monday. MEK will call back later this pm.

2030 MEK called. Pete Henderson looks like he'll be able to come help out. MEK will call tomorrow to confirm.

MKD 12/17/00

12/17 MKD

CTO-099

Monday Dec. 18, 2000. Today's Tasks -
Well installation @ SWMU 3.
Weather Conditions -
AM: Var. Clouds, breezy, & mid 70's
PM: M. Sunny, breezy, & mid 80's

0635 Arrive at TWFF. GS & SEW prep. for groundwater sampling. I prep for well installation

0703 Geoworks is on NSRR somewhere - did not check in at TWFF. They may be wait for Backhoe to come from Vieques Is. today.

0736 Geoworks at TWFF.

0748 Setup at 7GW15 (near WWTP at landfill)

0803 Begin boring for well 7GW15. Although passing shower delays collection of first sample.

0815 Resume drilling

0900 PVC installed. Crew must wait for foreman to return w/ filter sand (had to go off base to buy).

0935 Foreman back on site

1048 Relocate to R7GW02. Landfill

MKD 12/18

CTO-099

(cont.) personnel cleared a path to it.

1100 Begin boring for well 7GW16
Herminio on-site as well

1132 Savannah called. C-O-C/cooler CTO-099-09 missing. Friday shipment arrived today (not Sat.), but temp is fine. Baker needs to locate.

1214 7GW16 complete. Pull off location will take lunchbreak. I go to look for GS & SEW.

1311 I found GS & SEW @ TWFF after lunchbreak.

1407 Geoworks relocates to R7GW04

1437 Begin boring for 7GW17.

1557 Savannah says can use water from samples they have (6L) enough, but no extra for reruns. Color only parameter missed. JCE called FedEx. missing cooler not found. (yet)

1614 Note that Herminio has been on & off SWMU 3 throughout the afternoon.

12/18 MKD

CTO-099

7GW15 Replaces R7GW01

Time	ID	Depth (Ft)	Blow Counts	Recovery (Ft)	PID PS/BGS
0816	S-1	0-2	4-6-9-10	1.1	(1)
0821	S-2	2-4	10-13-4-3	1.2	(1)
0824	S-3	4-6	2-2-2-2	1.1	(1)
0826	S-4	6-8	1-1-2-1	1.5	(1)
0837	S-5	8-10	1-1-1-1	1.3	(1)
0901	A-N	10-14	-	-	-
	BOH @	14.0'			

(1) Condition wet - PID not working properly.

MKD 12/18

CTO-099

Rig: B-61 Spoons - 2" OD

Description

CLAY, some F gravel, trace c sand; brown; stiff; moist (FILL)

F SAND, trace coral frag; silt, gray; m. dense; damp (NATIVE)

As above; little shell; coral frag; silt w/silt layers bottom; gray; loose; wet

F/M SAND, trace silt w/ silt layers bottom; gray; v. loose; wet WATER @ 4.5' 7.8

SILT, little clay; gray; soft; moist; H_2SO_4 odor

1652 Boring drilled to 19' bgs. Collapsed to ~16' bgs. No water in boring. Will come back tomorrow to check if water is present; to what depth.

1702 Geoworks; I relocate to the decon area

1715 Geoworks off site - done for the day. I cleanup Baker area.

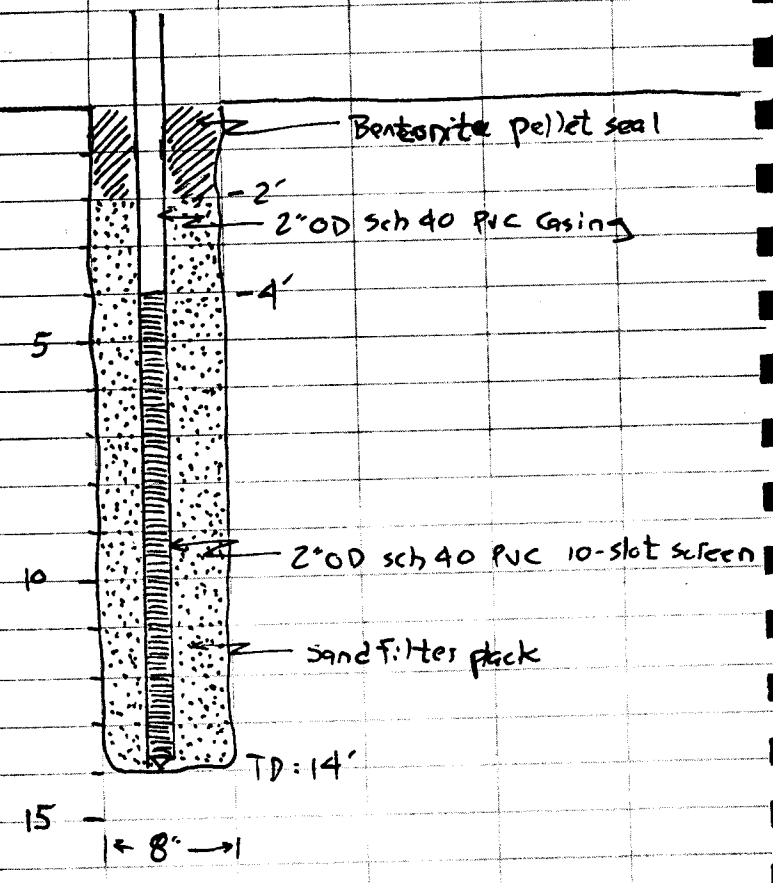
1740 SEW; GS arrive at TWFF.

1750 DB at TWFF.

12/18 MKD

CTO-099

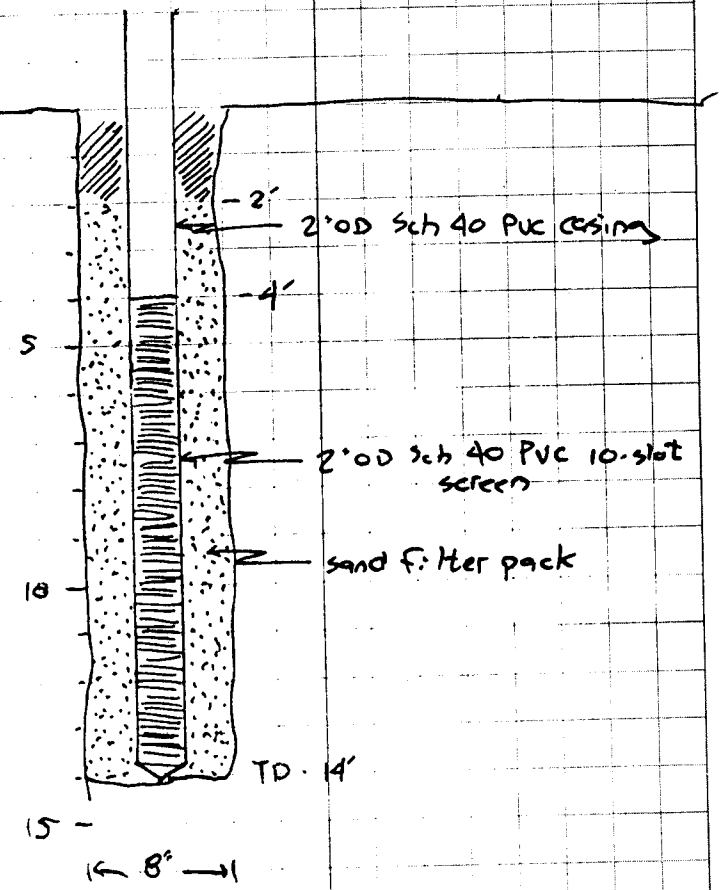
76W15 Construction Details



MKD 12/18

CTO-099

76W16 Construction Details



12/18 MKD

CTO-099

76W16 Replaces R76W02

Time	ID	Depth (Ft)	Blow Counts	Recovery (Ft)	PID PS/BG
1104	S-1	0-2	1-2-2-1	0.4	0.0/0.0
1109	S-2	2-4	5-3-2-2	1.3	0.0/0.0
1111	S-3	4-6	1-1-1-1	0.9	0.0/0.0
1113	S-4	6-8	1-3-1-1	0.8	0.0/0.0
1120	S-5	8-10	1-1-1-1	0.2	–
1147	A-N	10-14	–	–	–

1800 GS, SEW, & DB to collect more sample from S10-MW06. I will depart for SJU to pickup Jim Culp.

2040 Pickup JSC at airport Return to condo.

MKD 12/18

CTO-099

Rig: B-61 Spoon: 2" OD

Description

F/C SAND, some clay, little f gravel; dk brown; loose; moist (FILL)

As above, some f gravel, little clay; black; loose; moist (wet on top) 4.0'

F SAND, some silt, little shell & coral frag; gray; wet WATER @ 4.0'; v. loose

F SAND & SILT, little coral frag; dk gray; loose; wet (NATIVE @ 4.0')

F/M SAND (as shell frag.), trace silt; gray; v. loose; wet

* Diesel odor (slight) note on soil cuttings but no PID reading.

12/18 MKD

CTO-099

76W17

Replaces R76W04

Time	ID	Depth (Ft)	Blow counts	Recovery (Ft)	PID PS/BG
1439	S-1	0-2	1-15-29-20	0.9	0.0/0.0
1445	S-2	2-4	20-25-25-25	0.5	0.0/0.0
1451	S-3	4-6	43-32-25-23	0.5	0.0/0.0
1456	S-4	6-8	13-12-10-9	0.8	0.0/0.0
1502	S-5	8-10	11-10-9-8	0.5	0.0/0.0
1524	S-6	10-12	9-11-14-12	0.5	0.0/0.0
1528	S-7	12-14	6-9-11-35	0.4	0.0/0.0
1536	S-8	14-16	50/4"	0.0	—
1632	A-N	16-18	—	—	—
	BONE	19	MKD		

MKD 12/15

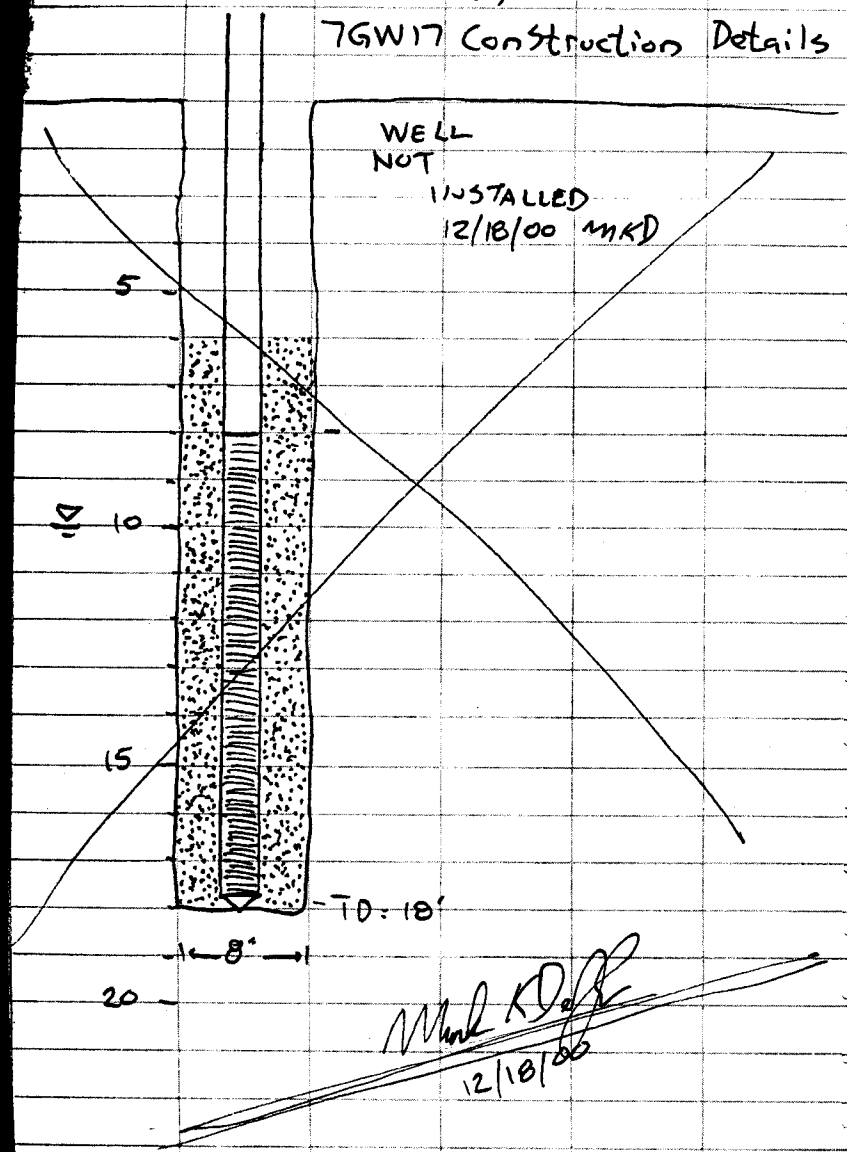
Rig- B-61 Spoons - 2" OD

Description
SILT, some f/c rock frag, trace f sand; clay; brown; dense; damp
Weathered ROCK FRAG, some silt; gray; dense; dry (FILL)
SILT, some rock frag; trace f sand; dk gray; v. dense; dry (FILL)
weathered ROCK FRAG; mottled brown; m. dense; damp (FILL)
SILT, some rock frag, little clay; brown; m. dense; damp (FILL) 10.0'
SILT & CLAY, trace rock frag & shell frag; H_2S odor dk gray; v. stiff; wet WATER @ 10'
As above, little rock frag & sandy zones; dk gray; v. stiff; wet
No recovery (probably rock frag.) (NATURAL @ 10')

12/18 MKD

CTO-099

7GW17 Construction Details



MKD 12/18

CTO-099

Tues. Dec. 19, 2000. Today's Tasks -
Complete well installation
Weather Conditions
AM: M. Sunny, breezy, & mid 70's
PM: Var. Cloudy, some rain, & Mid 80's

0644 Arrive at TWFF w/ JSC. JSC to provide assistance on project. He will perform supervisory support for well development & adandonment.

0719 JSC & I relocate to SWMU 3 to check for water in 7GW17

0820 Geoworks & JSC setup at 7GW17. We will drill to ~26' bgs & install well there.

0841 Visit w/ Madeline Rivera (EMD) to discuss project status. Geoworks backhoe not available until Thurs. pm. Able to schedule JA Jones for this afternoon. Will have to alter schedule slightly.

1006 Was supposed to meet backhoe operator, but I didn't see him. Will try later.

1135 Take lunchbreak w/ JSC & DB. The

12/19 MKD

CTO-099

(Cont.) Lab called. Only 2 of 8 coolers arrived this morning.

1327 Geoworks is building pads right now. JSC & I talked about well installation - Will set around 30'. GS reports that 510-MW05 is not readily accessible due to dense terrain & thick vegitation. Also, the back-hoe is not available due to mechanical problems. Will try Thurs. @ 0715.

1531 Per JCE request, I Faxed COCs to Michelle Russo (from 12/18). Per GS request, I attempted to locate 510-MW05. I could not find it based on location on drawing

1546 The six coolers from yesterday have been found & will be at lab by 10:30 am tomorrow. The other cooler has yet to be found. JCE asked to inventory PCB transformers @ SWMU 54..

1600 Assist GS & SEW with sample packing.

MKD 12/19

1707 I relocate to SWMU Background area to clear a path to the Mangrove swamp.

1756 Found a location about 200-250' east of SW/SP12. This will be a good entrance point for the background.

1817 Depart TWFF - done for the day

MKD 12/19/00

12/19 MKD

CTO-099

Wednesday Dec. 20, 2000. Today's tasks-
SW/SD sampling @ SWMU 9
Weather Conditions-
AM: M. Sunny, breezy; high 70's
PM: M. Sunny, breezy; mid-80's

0641 Arrive at Bundy Area - SWMU 54 to sample 54TW01

0645 Dielectric fluid containing equip inventory:
1 - Non PCB pole transformer
2 <50 ppm PCB " "
1 <50 ppm PCB ground transformer (in crate)

0725 Return to TWFF. Prep. for SW/SD sampling.

0815 Arrive at Background sampling entrance point.

1028 Collection of Background samples completed. Prep. for Area C.

1218 Area C SW/SD sample collection completed.

1238 Call from MEK. One of nine coolers missing; may have to resample 54SS10; SS11 plus color from S10-MW1.

MKD 12/20

CTO-099

(cont.) Check for bottles

1452 Pedro Ruiz helped me locate S10-MW5.

1530 Begin collection of 2000FB03 from pumphouse tap at TWFF.

1550 Assist w/ sample packing.

1800 JCE; I prepare field blanks; equip rinsates. I collect 2000FB01 sample of lab-supplied DI water

1917 Depart site - done for the day.

MKD 12/20/00

12/20 MKD

CTO-099

Thurs. Dec. 21, 2000. Today's Tasks -
Demob.
Weather Conditions
AM: P. Sunny, breezy, & mid. 70's
PM: M. Sunny

0645 Arrive at SWMU 54 w/ GS & SEW. Located 510-MW5. They will sample

0715 Relocate to 7GW12 Meet JSC. He is overseeing well development. Problem w/ 7GW12 TD is 15' from bgs. Now it is ~12'. Problem at 7GW13. Geoworks backhoe damaged asphalt. Geoworks must repair.

0736 Meet Solis of JA Jones to have them regrade SWMU 53 area.

0815 Problems w/ Geoworks - not prepared to abandon wells & development method not working properly. Will have to complete after 1/8/01. Geoworks closed till then.

1055 Assisted w/ sample packing. Arranged to dispose SWMU 3 soil in landfill - talked to operator.

MKO 12/21

CTO-099

(cont.) Driller needs to go thru office for approval. Driller tasks - Abandon wells (TWs) at SWMU 54 Move drums & finish new well pads

1101 MEK asked for 12/20 airbill
8078 5375 6839 (1)
8078 5375 6828 (4)

1146 Visit w/ Madeline to talk about finishing work 1/8/01. Also, storage of chemicals till I come back. We need to cover open holes and put contact info. on coverings.

1213 Nitric acid (2 containers) and Methanol (1) temporarily stored at Filteration Plant until we come back 1/8/01.

1232 All equip & samples packed - looking for FedEx.

1417 Meet FedEx. We can meet him at the exchange in about 1/2 hour. He is behind schedule.

12/21 MKO

CTO-099

1500 JSC; I leave exchange to return Box truck rental; head to airport GS; STW will follow after FedEx picks up packages. Remainder of day for travel

MKD 12/22/00

MKD 12/22

Func: GPS

GPS Configure GPS

Rover options

724-482-4440

APPENDIX D.4
Field Notes from Jim Culp - Geologist

Projects (continued)

900 - Headed to House to get stuff
1200 - Flight Delayed
1300 - Left Pitts, Pa.
1500 - Caught Flight in JFK
1630 - Left JFK to Puerto Rico (Delayed again)
2030 - Arrived in PR.
2200 - Arrived @ PALMAS

26007 - 099 12/19/00 ①

0650 - Arrived @ Roosevelt Rds for Day's Activities.

To Do:
- Call Jeff / Carl
- Well Development (6 wells)
- Abandon 6 wells

Abandonment Procedures:
- Remove well head and fill casing with grout.

Development:
- Collect development H_2O in Drums
- Visual inspection of clearity / surge
- Repeat several times

0719 - Finished Loading equipment And Headed to SWMU 3.
0744 - Got H_2O level From ~~MW~~ 7GW17 AND R1GW04

JL

0812: I will be advancing #26GW17 to 25 feet and complete well. (SEE pg. 4 for Details).

0834 - ARRIVED @ WELL AND BEGAN DRILLING

0909 - HIT HARD obstruction AT 22' bgs. PULLED AUGERS AND began SETTING UP for ~~CORING~~ AIR HAMMER w/ DIAMOND BIT.

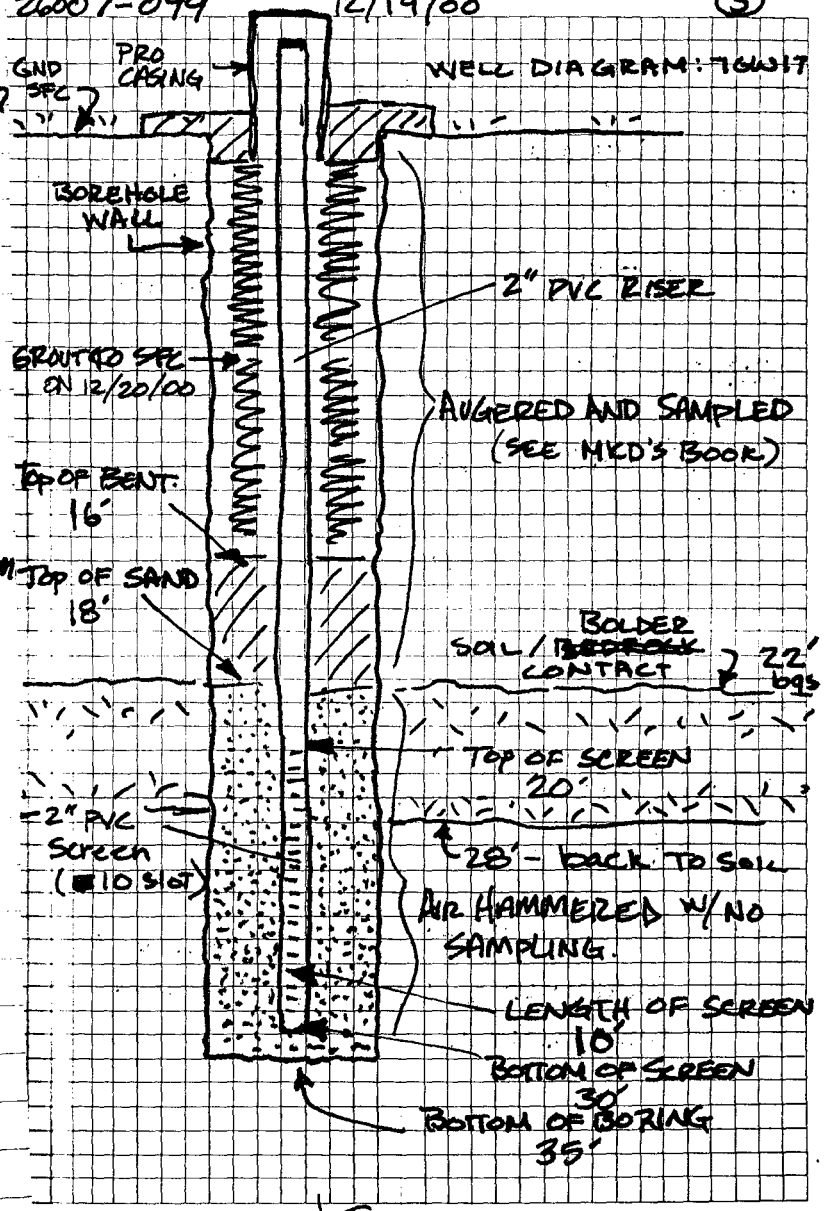
0925 - BEGAN DRILLING USING AIR HAMM ~~CORING~~ METHODS.

0957 - SOIL REMOVED FROM BOREHOLE IS A SILTY SAND w/ SIGNS of WATER. WE HAVE DECIDED TO LEAVE THE WELL SIT for an hour TO SEE IF WATER ACCUMULATES.

1030 - MET w/ MKD. WE HEADED TO TRAILER TO Collect RINSEATES.

1040 - CHANGE IN PLAN - WE HEADED TO NEX TO GET MINUTES FOR PHONE AND GRAB Lunch During

(Cont. on pg. 6)



7GW17

DEPTH	SAMPLE REC	BLOWS	REC	PID
20-22	~~[illegible]~~ AN	SEE NOTE	–	–
22-24	AN	SEE NOTE	–	–
24-~~28~~ 25	AN	SEE NOTE	–	–
25-28	N	SEE NOTE	–	–
28-30	N	SEE NOTE	–	–
30-35	N	SEE NOTE	–	–

NOTE: HIT ROCK @22', HAD TO SWITCH TO DIAMOND BIT TO ADVANCE HOLE. (AIR HAMMER)

JSL

DESCRIPTION	TIME
1ST 22' IS IN MKD'S BOOK.	
SEE NOTE - AIR HAMMERING THROUGH WHAT APPEARS TO BE A LIMY SHALE. NO SIGNS OF WATER. WE HAVE DECIDED TO GO TO 30'.	~~0928~~ 0943
@ NOTE ~28' encountered a SILTY SOIL BENEATH WHAT APPEARS TO HAVE BEEN A LARGE BOLDER, MOIST.	0954
FROM 30'-35': SOIL IS SILTY Sand WITH SIGNS OF WATER.	
TD = 35' bgs.	

JSL

1040 (cont.) HEAVY RAINS. TOLD OMAR THAT I WOULD CONTACT HIM AS SOON AS I GOT H_2O LEVELS from 7GW17.

1100 - CALLED OFFICE AND GRABBED LUNCH.

1130 - TOOK MKD TO PUBLIC WORKS TO GET CAR UNLOCKED.

1300 - HAD DEL BROWN DROP ME OFF @ LANDFILL TO CHECK WATER LEVEL IN 7GW17.

1310 - WATER LEVEL IN 7GW17 WAS 22.4'. NEARLY 8' of H_2O in the Well.

1340 - MKD DROPPED ME OFF w/ DRILLERS TO WAIT FOR THEM TO COMPLETE PADS PRIOR TO finishing 7GW17.

1447 - WENT w/ DRILLERS TO Complete 7GW17. I repeatly tried to Reach MKD w/ NO LUCK. HE MUST BE OUT of RANGE FOR THE RADIO.

JSC

1506 - Began Setting Screen to 30' bgs. I finally reached Glaréa and passed info regarding ballards to her. The message was as follows:

"Omar stated that we could save time if we re-use the old ballards instead of scrapping them. If they are not destroyed durcing well abandonment."

1523 - STILL WORKING ON SETTING THE MONITORING WELL (7GW17).

1535 - Finished Sandpack.

1600 - Completed Bentonite Seal.

1616 - ARRIVED @ FIELD TRAILER TO BEGIN COLLECTING QA/QC samples.

1700 - After helping Glaré and Sara Pack Samples for Shipment, I began collecting 54ER03 (BAILER).

1730 - Collected 54ER03.

1750 - FINISHED PACKING UP 54ER03

JSC

1800 - MKD and Delbert arrived @ Field trailer.

1835 - Finished for the Day after unload Glaré and Sara's equipment.

0655 - ARRIVED @ FIELD TRAILER.

0730 - DRILLERS ARRIVED AT FIELD TRAILER. MKD WANTS ME TO DEVELOP WELLS, REMOVE OLD WELLS AND SET REMAINING PAD.

0740 - I GOT GLARÉ TO EXPLAIN TO THE DRILLERS WHAT WE NEED TO DO TODAY.

0825 - Completed GROUTING HOLE TO GROUND SURFACE (SEE DIAGRAM ON PG 3). THEY ARE PREPARING TO Begin MAKING THE PROTECTIVE PAD AROUND 7GW17.

0944 - Drillers Continue to Set Bollards around 7GW17. I Broke up the PAD AROUND 7GW04.

1008 - Talked w/ Mark Kimes. I Provided an update to the Site activities.

1141 - We are setting bollards around each new well.

1200- Drillers broke for Lunch. They wanted to know if Mark was going to get a backhoe b/c Some of the pads were in excess of 8" thick.

1230- Broke For Lunch

1330- Began helping Drillers again. Talked w/ MKD About schedule

1400- The Drillers Ran out of Cement And I believe they are going back to Office Trailer to get some.

1410- MKD informed me that we are to quit making Pads and begin development

1430- Drillers finished pad and went back to field trailer to get dev. equipment.

1454- Headed to Develop wells.

1500- Began developing the well near the Beach. Approx 1½-2 feet of water in well I was not able to get a

Sd

1500 (Cont)- water level b/c by the time I got to the well the drillers had already begun Surging the well.

1604- The water is so full of Sediment that the pump will not pull water to develop. They are using a "White Whale" electrical pump. This well needs to be developed using A Waterra.

1630- Talked w/ MKD about getting another pump for tomorrow.

1800- Finished Packing Coolers for Shipment and started to collect 54ERDI of Stainless Steel Split Spoon.

*LATE NOTE @ 1700- Drillers said they would try to bring a trash pump to the Site tomorrow. They will be on Site @ 7:00 Am.

Sd

1915 - Left Field trailer after collecting 54ER01 from a stainless steel spoon. We cleaned up and left for the Day.

0655 - Arrived @ Field trailer. Drillers arrived shortly thereafter. We are going to try to develop all wells today. Only two people showed up on site like yesterday. MKD went w/ Gary and Sara to try to find the remaining well that can not be located.

0710 - THEY (THE DRILLERS) DID NOT BRING THE TRASH PUMP but brought a compressor to blow water out. They have no way to containerize the water that exits the well.

The water level was measured to be 10.78' below TOC.; Total depth of well = 14.0' from TOC.

I thought that I would allow the use of the compressor on the well near the beach to see if water will come out of the well.

0721- It appears that formation materials have entered the screen. A light grey sand and shell frags make up the muddy water

0727 7GW13: TD = 19.65' TOC
H2O = 14.16' TOC

Set up and prepared to develop this well. A gentleman was upset w/ the condition of the asphalt near 7GW13. The drillers had marked up the asphalt near 7GW13 while they used the backhoe to remove the top of [redacted] 7GW13. MKD met w/ him and said we would take care of it. We need to contact OMAR about it. Victor Hiraldo- Caribco was the engineer who complaind

0740- The drillers can not get the pump to work (white whale) We can not use air b/c we cannot containerize the water.

0745- William from Geoworks showed up on site. He speaks english - I told him about the asphalt patch and divots.

0802- We prepared to develop the well using air. They managed to design a way to collect the water in drums. THEIR ATTEMPTS ARE NOT WORKING. We may have to change plans. We can not develop the wells properly, so we need to address IDW management, well abandonment and asphalt repair.

0839- Showed Mark the well pad and how thick the concrete is. He is going to call OMAR about several items.

0915- Covered the portion of the old well that remains near the beach. The stand pipe remains and I covered it w/ heavy plastic and a second layer consisting of a garbage bag. This was done to remove any chance of water in the form of precipitation to enter the well and aquifer.

1002- Helped pack samples and tape labels. Now I am going to follow-up on drillers work.

1028- Checking on Drillers Pad Construction.

1045- Could not find the Drillers, but Bollards are in holes at each well except the one btn the two gates at the landfill.

1200- Tried to Find Fed-x.

1500- headed to baseman to return truck and then to airport.

1730- Caught Flight to Pitts, Pa.

2130- Arrived in Pitts, Pa and awaited Luggage. Finished for day.

APPENDIX E
Analytical Laboratory Results

Data Qualifiers:

U – Not Detected.
J – Estimated value.
UJ – Report quantitation limit is qualified as estimated.
NJ – Result is considered present at an estimated concentration.
R – Result is rejected and unusable.
D – Result value is based on dilution analysis.
B – Reported value was obtained from a reading that was less than the Project Reporting Limits but greater than or equal to the Method Detection Limit.

Notes:

mg/kg – milligrams per kilogram.
ug/kg – micrograms per kilogram.
ug/L – micrograms per liter.
mg/L – milligrams per liter.
ug/wipe – micrograms per wipe.
ft/bgs – feet below ground surface.
L – Langlier Index.
PCU – primary color units.
TON – threshold odor number.

APPENDIX E.1
Background, Surface Soil - Inorganics

APPENDIX E.1

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - INORGANICS BACKGROUND
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	BGMW01-00	BGMW02-00	BGMW03-00	BGMW04-00
Sample Date	04/04/96	04/04/96	04/04/96	04/04/96
Depth Range (ft.)	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Inorganics, Total (mg/kg)				
Antimony	2.4 UJ	2.2 UJ	2.3 UJ	2.3 UJ
Arsenic	1.2	0.35 J	1.5	1.8
Barium	169	94.1	35.6	63.7
Beryllium	0.36	0.1 U	0.28	0.21
Cadmium	0.28 U	0.26 U	0.27 U	0.27 U
Chromium	44.1 J	11 J	33.6 J	29.9 J
Cobalt	30.2	27	9.5	21.2
Copper	98.5	250	57	62.9
Lead	9.6	2.4	6.6	11.9
Mercury	0.06	0.04 U	0.07	0.07
Nickel	10.9	7.8	5.8	8.6
Selenium	0.56 J	0.13 UJ	1.2 J	1.1 J
Silver	0.39 U	0.35 U	0.37 U	0.37 U
Sulfide	29.2 U	28.8 U	29.2 U	26.7 U
Thallium	0.1 J	0.08 U	0.09 UJ	0.09 UJ
Tin	1.3 U	1.2 U	1.4	2.2
Vanadium	227	123	189	170
Zinc	106 J	66.2 J	34.2 J	43.9 J
Cyanide	0.47 U	0.57 U	0.46 U	0.56 U

APPENDIX E.1

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - INORGANICS
BACKGROUND
SWMU 26 (BUILDING 544 AREA)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	26SS13	26SS14	26SS15
Sample Date	09/20/97	09/20/97	09/20/97
Depth Range (ft bgs)	0.00-0.50	0.00-0.50	0.00-0.50
Inorganics (ug/kg)			
Arsenic, Total	1,100 J	1,700 J	1,500 J
Beryllium, Total	960	750	1,200

APPENDIX E.2
Background, Subsurface Soil - Inorganics

APPENDIX E.2

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL - INORGANICS
BACKGROUND
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	BGMW01-04	BGMW01-06	BGMW02-05	BGMW02-08	BGMW03-03	BGMW03-04	BGMW03-04D	BGMW04-02	BGMW04-04
Sample Date	04/23/96	04/23/96	04/22/96	04/22/96	04/12/96	04/12/96	04/12/96	04/24/96	04/24/96
Depth Range (ft.)	8.0-10.0	12.0-14.0	10.0-12.0	16.0-18.0	6.0-8.0	8.0-10.0	8.0-10.0	4.0-6.0	8.0-10.0
Inorganics, Total (mg/kg)									
Antimony	2.6 R	3 R	3.4 R	2.8 R	2.8 UJ	2.8 UJ	3 UJ	2.6 R	2.7 R
Arsenic	1.7	0.22 UJ	0.71 J	1	2.4 J	0.76 J	0.94 J	0.72	0.79
Barium	13 J	243 J	178 J	178 J	9.7	3.5	10	246 J	17.3 J
Beryllium	0.29	0.7	0.37	0.74	0.15	0.25	0.26	0.33	0.13
Cadmium	0.46	0.44	0.4 U	0.62	0.33 UJ	0.33 UJ	0.36 UJ	0.48	0.43
Chromium	101 J	84.1 J	148 J	29.1 J	58.9 R	63.6 R	45.9 R	34.7 J	10.9 J
Cobalt	3.7	14	15.7	42.4	2	4.3	3.8	33.8	4.1
Copper	65.3	120	144	131	72.9 R	94.5 R	90.1 R	107	37.6
Lead	4.8	4.9	3.3	2.6	4.1 J	3.4 J	2.4 J	5	6.6
Mercury	0.05 U	0.06 U	0.06 U	0.05 U	0.06 UJ	0.17 J	0.25 J	0.06 U	0.06 U
Nickel	7.2	39.9	35.6	23	3.7	5.8	5.7	10.2	2.2
Selenium	0.22 J	0.17 UJ	0.19 UJ	0.16 UJ	1.2 J	0.3 UJ	0.32 UJ	0.37 J	0.16 UJ
Silver	0.42 U	0.48 U	0.55 U	0.46 U	0.46 U	0.45 U	0.9	0.42 U	0.43 U
Sulfide	30.4 U	32.7 U	36.1 U	33.6 U	33.1 U	33.9 U	37.8 U	28.3 U	32.5 U
Thallium	0.59 UJ	0.13 UJ	0.15 UJ	0.13 UJ	0.11 UJ	0.11 UJ	0.11 UJ	0.12 UJ	0.12 UJ
Tin	1.4 UJ	3.1 J	1.9 UJ	3.4 J	1.5 UJ	1.5 UJ	1.7 UJ	1.4 UJ	1.5 J
Vanadium	206	256	373	232	204	260	236	234	83.9
Zinc	24.1 J	64.6 J	55.7 J	98.5 J	14 J	23 J	20.1 J	56.2 J	18.4 J
Cyanide	0.57 U	0.7 U	0.76 U	0.69 U	0.46 U	0.61 U	0.69 U	0.59 U	0.64 U

APPENDIX E.2

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL - INORGANICS
BACKGROUND
SWMU 26 (BUILDING 544 AREA)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	26SB13	26SB14	26SB15
Sample Date	09/20/97	09/20/97	09/20/97
Depth Range (ft bgs)	2.50-3.00	2.50-3.00	2.50-3.00
Inorganics (ug/kg)			
Arsenic, Total	890 J	940 J	1,600
Beryllium, Total	620	690	1,200

APPENDIX E.3
Background, Groundwater – Total Inorganics

APPENDIX E.3

SUMMARY OF ANALYTICAL RESULTS, GROUNDWATER - INORGANICS (TOTAL) BACKGROUND
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	BGMW01	BGMW02	BGMW03	BGMW04
Sample Date	04/27/96	04/27/96	04/16/96	04/27/96
Inorganics, Total (ug/l)				
Antimony	24.6 UJ	24.6 UJ	24.6 UJ	24.6 UJ
Arsenic	1.8 U	1.8 U	1.7 J	3.6
Barium	275	212	313	612
Beryllium	2	1.1 U	1.1 U	2.3
Cadmium	7.5	2.9 U	2.9 U	2.9 U
Chromium	54.1	3.1 R	29.4	92
Cobalt	91.8	54.3	55.4	83.4
Copper	120	24	102	352
Cyanide	10 U	10 U	10 R	10 U
Lead	4.3 J	0.9 UJ	2.5 J	7 J
Mercury	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	73.7	40	26.4	39.4
Selenium	2.8 UJ	1.4 UJ	1.4 UJ	3.1 J
Silver	4 U	4 U	4 U	4 U
Sulfide	1,000 U	1,000 U	1,000 U	1,000 U
Thallium	1.6 UJ	1.6 U	1 U	1.6 UJ
Tin	13.5 U	13.5 U	13.5 U	13.5 U
Vanadium	159	26.8	103	549
Zinc	178	95.7	128	320

APPENDIX E.4
SWMU 53, Surface Soil – Pesticides/PCBs

APPENDIX E.4

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - PESTICIDES/PCBs
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	53SS01	53SS02	53SS03	53SS04	53SS05	53SS06	53SS06D	53SB01-00
Sample Date	12/13/00	12/13/00	12/13/00	12/13/00	12/13/00	12/13/00	12/13/00	12/14/00
Depth	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Pesticides/PCBs (ug/kg)								
4,4'-DDD	38 UJ	430 UJ	7.8 UJ	48 J	4.2 UJ	21 J	71 J	4.5 U
4,4'-DDE	300 J	970	28	310	8	140 J	360 J	4.5 U
4,4'-DDT	290 J	5,100 J	80 J	230	14	85 J	390 J	4.5 U
Aldrin	19 U	220 U	4 U	39 U	2.2 U	19 U	37 U	2.3 U
Chlordane	190 U	2,200 U	40 U	390 U	22 U	190 U	370 U	23 U
Dieldrin	38 UJ	430 UJ	7.8 UJ	76 U	4.2 U	36 U	72 U	4.5 UJ
Endosulfan I	19 U	220 U	4 U	39 U	2.2 U	19 U	37 U	2.3 U
Endosulfan II	38 UJ	430 UJ	7.8 UJ	76 U	4.2 U	36 U	72 U	4.5 U
Endosulfan sulfate	38 U	430 U	7.8 U	76 UJ	4.2 UJ	36 UJ	72 UJ	4.5 U
Endrin	38 UJ	430 UJ	7.8 UJ	76 UJ	4.2 UJ	36 UJ	72 UJ	4.5 UJ
Endrin aldehyde	38 U	430 U	7.8 U	76 U	4.2 U	36 U	72 U	4.5 UJ
Heptachlor	19 U	220 U	4 U	39 U	2.2 U	19 U	37 U	2.3 U
Heptachlor epoxide	19 UJ	220 UJ	4 UJ	39 UJ	2.2 UJ	3.2 J	37 UJ	2.3 U
Methoxychlor	190 U	2,200 U	40 U	390 U	22 U	190 U	370 U	23 UJ
Toxaphene	1,900 U	22,000 U	400 U	3,900 U	220 U	1,900 U	3,700 U	230 U
alpha-BHC	19 U	220 U	4 U	39 U	2.2 U	19 U	37 U	2.3 U
beta-BHC	19 U	220 U	4 U	39 U	2.2 U	19 U	37 U	2.3 U
delta-BHC	19 U	220 U	4 U	39 U	2.2 U	19 U	37 U	2.3 U
gamma-BHC (Lindane)	19 U	220 U	4 U	39 U	2.2 U	19 U	37 U	2.3 U
Aroclor-1016	380 U	4,300 U	78 U	760 U	42 U	360 U	720 U	45 U
Aroclor-1221	760 U	8,800 U	160 U	1,500 U	86 U	740 U	1,500 U	92 U
Aroclor-1232	380 U	4,300 U	78 U	760 U	42 U	360 U	720 U	45 U
Aroclor-1242	380 U	4,300 U	78 U	760 U	42 U	360 U	720 U	45 U
Aroclor-1248	380 U	4,300 U	78 U	760 U	42 U	360 U	720 U	45 U
Aroclor-1254	380 U	4,300 U	78 U	760 U	42 U	360 U	720 U	45 U
Aroclor-1260	380 UJ	4,300 UJ	78 UJ	760 U	42 U	360 U	720 U	45 U

APPENDIX E.4 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - PESTICIDES/PCBs
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	53SB02-00	53SB02-00D	53SB03-00	53SB04-00	53SB04-00D	53SB05-00	53SB06-00
Sample Date	12/14/00	12/14/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00
Depth	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Pesticides/PCBs (ug/kg)							
4,4'-DDD	12 J	4 J	4.1 U	8.5 U	4.2 U	370 UJ	3.6 UJ
4,4'-DDE	47 J	25 J	0.5 J	19	11	390 NJ	32
4,4'-DDT	340 J	150 J	1.4 J	38	14	1,200 J	25
Aldrin	24 U	4.6 U	2.1 U	4.4 U	2.2 U	190 U	1.9 U
Chlordane	240 U	46 U	21 U	44 U	22 U	1,900 U	19 U
Dieldrin	46 UJ	8.9 UJ	4.1 UJ	8.5 UJ	4.2 UJ	370 UJ	3.6 U
Endosulfan I	24 U	4.6 U	2.1 U	4.4 U	2.2 U	190 U	1.9 U
Endosulfan II	46 U	8.9 U	4.1 U	8.5 U	4.2 U	370 UJ	3.6 U
Endosulfan sulfate	46 U	8.9 U	4.1 U	8.5 U	4.2 U	370 U	3.6 UJ
Endrin	46 UJ	8.9 UJ	4.1 UJ	8.5 UJ	4.2 UJ	370 UJ	3.6 UJ
Endrin aldehyde	46 UJ	8.9 UJ	4.1 UJ	8.5 UJ	4.2 UJ	370 U	3.6 U
Heptachlor	24 U	4.6 U	2.1 U	0.34 J	2.2 U	190 U	1.9 U
Heptachlor epoxide	24 U	4.6 U	2.1 U	4.4 U	2.2 U	190 UJ	0.43 J
Methoxychlor	240 UJ	46 UJ	21 UJ	44 UJ	22 UJ	1,900 U	19 U
Toxaphene	2,400 U	460 U	210 U	440 U	220 U	19,000 U	190 U
alpha-BHC	24 U	4.6 U	2.1 U	4.4 U	2.2 U	190 U	1.9 U
beta-BHC	24 U	4.6 U	2.1 U	4.4 U	2.2 U	190 U	1.9 U
delta-BHC	24 U	4.6 U	2.1 U	4.4 U	2.2 U	190 U	1.9 U
gamma-BHC (Lindane)	24 U	4.6 U	2.1 U	4.4 U	2.2 U	190 U	1.9 U
Aroclor-1016	460 U	89 U	41 U	85 U	42 U	3,700 U	36 U
Aroclor-1221	940 U	180 U	83 U	170 U	86 U	7,500 U	74 U
Aroclor-1232	460 U	89 U	41 U	85 U	42 U	3,700 U	36 U
Aroclor-1242	460 U	89 U	41 U	85 U	42 U	3,700 U	36 U
Aroclor-1248	460 U	89 U	41 U	85 U	42 U	3,700 U	36 U
Aroclor-1254	460 U	89 U	41 U	85 U	42 U	3,700 U	36 U
Aroclor-1260	460 U	89 U	41 U	85 U	42 U	3,700 UJ	36 U

APPENDIX E.5
SWMU 53, Surface Soil - Inorganics

APPENDIX E.5

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - METALS
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	53SS01	53SS02	53SS03	53SS04	53SS05	53SS06	53SS06D	53SB01-00
Sample Date	12/13/00	12/13/00	12/13/00	12/13/00	12/13/00	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Metals (mg/kg)								
Antimony	0.53 J	0.97 J	3.1 J	6.1 J	1.5 J	5.9 J	0.71 J	2.5 UJ
Arsenic	5.6	1.5	3.1	3.1	1.3	4.7	2.2	2.3 J
Barium	170 J	110 J	390 J	670 J	200 J	630 J	160 J	100 J
Beryllium	0.2 J	0.38 J	0.33 J	0.29 J	0.21 J	0.21	0.15 J	0.28 J
Cadmium	0.94	0.81	1.6	2.1	2.8	3.6	1.1	0.54 J
Chromium	39 J	59 J	87 J	130 J	52 J	62 J	26 J	45 J
Cobalt	35	57	47	40	33	31	24	38
Copper	87 J	84 J	79 J	70 J	120 J	99 J	110 J	83
Lead	300	120	2,500	3,600	900	3,900	470	11 R
Mercury	0.021 J	0.056 J	0.046 J	0.061 J	0.027 J	0.069 J	0.013 J	0.018 J
Nickel	25	23	25	24	23	18	13	24
Selenium	1 U	1.2 U	1	0.71 J	0.72 J	0.59 J	1 U	1.2 U
Silver	1 U	1.2 U	1.2 U	1.1 U	1.3 U	1.1 U	1 U	1.2 U
Thallium	1 U	1.2 U	1.2 U	1.1 U	1.3 U	1.1 U	1 U	1.2 U
Tin	5.2 U	6 U	20	10	35	6.5	5 U	6.2 U
Vanadium	170	180	170	160	170	150	130	170
Zinc	580	350	2,200	3,100	3,300	5,800	1,600	83 J

APPENDIX E.5

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - METALS
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	53SB02-00	53SB02-00D	53SB03-00	53SB04-00	53SB04-00D	53SB05-00	53SB06-00
Sample Date	12/14/00	12/14/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00
Depth (ft bgs)	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Metals (mg/kg)							
Antimony	1.2 J	0.8 J	2.2 UJ	2.3 UJ	1.1 J	2.8 J	2 UJ
Arsenic	3.4 J	2.7	0.86 J	2.9	4.7	5.6	1.1
Barium	120 J	100 J	120 J	82 J	100 J	270 J	68 J
Beryllium	0.24 J	0.2 J	0.25 J	0.17 J	0.19 J	0.17 J	0.16 J
Cadmium	1.5 J	0.87 J	0.48 J	1.2 J	1.5 J	2.3	0.47 J
Chromium	32 J	33 J	42 J	35 J	38 J	38 J	29 J
Cobalt	20	20	27	21	24	25	22
Copper	85	69	68	75	86	89 J	76 J
Lead	150 R	220 R	81 R	120 R	210 R	2,200	55
Mercury	0.047 J	0.041 J	0.028 J	0.039 J	0.043 J	0.037 J	0.011 J
Nickel	15	17	17	18	17	18	17
Selenium	1.4 U	1 J	0.58 J	0.72 J	0.65 J	1.3	1 U
Silver	1.4 U	1.2 U	1.1 U	1.2 U	1.3 U	1.1 U	1 U
Thallium	1.4 U	1.2 U	1.1 U	1.2 U	1.3 U	1.1 U	1 U
Tin	16 J	6.1 J	5.6 U	6.2 J	6.7 J	6.4	5 U
Vanadium	110	110	150	110	130	140	130
Zinc	1,000 J	530 J	300 J	530 J	750 J	2,400	120

APPENDIX E.6
SWMU 53, Subsurface Soil – Pesticides/PCBs

APPENDIX E.6

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL - PESTICIDES/PCBs
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	53SB01-03	53SB01-05	53SB02-02	53SB03-01	53SB04-02	53SB05-02	53SB06-03
Sample Date	12/14/00	12/14/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00
Depth (ft bgs)	4.0-6.0	8.0-10.0	2.0-4.0	0.0-2.0	4.0-5.5	2.0-4.0	4.0-6.0
Pesticides/PCBs (ug/kg)							
alpha-BHC	2.2 U	1.9 U	1.9 U	2 U	1.9 U	3.9 U	2 U
beta-BHC	2.2 U	1.9 U	1.9 U	2 U	1.9 U	3.9 U	2 U
delta-BHC	2.2 U	1.9 U	1.9 U	2 U	1.9 U	3.9 U	2 U
gamma-BHC (Lindane)	2.2 U	1.9 U	1.9 U	2 U	1.9 U	3.9 U	2 U
Heptachlor	2.2 U	1.9 U	1.9 U	2 U	1.9 U	3.9 U	2 U
Aldrin	2.2 U	1.9 U	1.9 U	2 U	1.9 U	3.9 U	2 U
Heptachlor epoxide	2.2 U	1.9 U	1.9 U	2 U	1.9 U	3.9 UJ	2 UJ
Dieldrin	4.2 UJ	3.7 U	3.6 UJ	3.8 UJ	3.7 UJ	7.5 UJ	3.8 U
4,4'-DDE	4.2 U	3.7 U	3.6 U	3.8 U	3.7 U	7.5 U	3.8 U
Endrin	4.2 UJ	3.7 U	3.6 UJ	3.8 UJ	3.7 UJ	7.5 UJ	3.8 UJ
Endosulfan II	4.2 U	3.7 U	3.6 U	3.8 U	3.7 U	7.5 UJ	3.8 U
4,4'-DDD	4.2 U	3.7 U	3.6 U	3.8 U	3.7 U	7.5 UJ	3.8 UJ
Endosulfan sulfate	4.2 U	3.7 U	3.6 U	3.8 U	3.7 U	7.5 U	3.8 UJ
4,4'-DDT	4.2 U	3.7 U	3.6 U	3.8 U	3.7 U	24 J	1.1 J
Methoxychlor	22 UJ	19 U	19 UJ	20 UJ	19 UJ	39 U	20 U
Endrin aldehyde	4.2 UJ	3.7 U	3.6 UJ	3.8 UJ	3.7 UJ	7.5 U	3.8 U
Toxaphene	220 U	190 U	190 U	200 U	190 U	390 U	200 U
Aroclor-1016	42 U	37 U	36 U	38 U	37 U	75 U	38 U
Aroclor-1221	86 U	74 U	74 U	77 U	74 U	150 U	78 U
Aroclor-1232	42 U	37 U	36 U	38 U	37 U	75 U	38 U
Aroclor-1242	42 U	37 U	36 U	38 U	37 U	75 U	38 U
Aroclor-1248	42 U	37 U	36 U	38 U	37 U	75 U	38 U
Aroclor-1254	42 U	37 U	36 U	38 U	37 U	75 U	38 U
Aroclor-1260	42 U	37 U	36 U	38 U	37 U	75 UJ	38 U
Chlordane	22 U	19 U	19 U	20 U	19 U	39 U	20 U

APPENDIX E.7
SWMU 53, Subsurface Soil - Inorganics

APPENDIX E.7

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL - METALS
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	53SB01-03	53SB01-05	53SB02-02	53SB03-01	53SB04-02	53SB05-02	53SB06-03
Sample Date	12/14/00	12/14/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00
Depth (ft bgs)	4.0-6.0	8.0-10.0	2.0-4.0	0.0-2.0	4.0-5.5	2.0-4.0	4.0-6.0
Metals (mg/kg)							
Antimony	2.6 UJ	2.2 UJ	2.2 UJ	2.1 UJ	2.2 UJ	2.3 UJ	2.3 UJ
Arsenic	1.6 J	0.79 J	0.61 J	0.59 J	1.6	0.56 J	0.88 J
Barium	43 J	1.5 J	57 J	170 J	130 J	160 J	130 J
Beryllium	0.81	0.19 J	0.17 J	0.28 J	0.27 J	0.24 J	0.42 J
Cadmium	0.46 J	0.24 J	0.36 J	0.37 J	0.54 J	0.24 J	0.31 J
Chromium	28 J	8 J	82 J	73 J	150 J	50 J	70 J
Cobalt	44	7.8	23	38	33	53	56
Copper	74	75	100	84	54	57 J	9.2 J
Lead	0.87 R	0.73 R	0.77 R	7.8 R	8.3 R	10	2.8
Mercury	0.023 UJ	0.0029 J	0.02 UJ	0.019 UJ	0.022 UJ	0.013 J	0.021 UJ
Nickel	19	12	42	30	40	18	32
Selenium	1.3 U	1.1 U	1.1 U	1 U	1.1 U	1.1 U	1.2 U
Silver	1.3 U	1.1 U	1.1 U	1 U	1.1 U	1.1 U	1.2 U
Thallium	1.3 U	1.1 U	1.1 U	1 U	1.1 U	1.1 U	1.2 U
Tin	6.4 U	5.6 U	5.5 U	5.2 U	5.6 U	5.7 U	5.8 U
Vanadium	170	110	120	150	140	120	120
Zinc	76 J	47 J	36 J	46 J	80 J	36	60

APPENDIX E.8
SWMU 53, Wipe Samples – Pesticides/PCBs

APPENDIX E.8

SUMMARY OF ANALYTICAL RESULTS, WIPE SAMPLES - PESTICIDES/PCBs
SWMU 53 - BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	53WP01	53WP02	53WP03	53WP04
Sample Date	12/17/00	12/17/00	12/17/00	12/17/00
Pesticides/PCBs (ug/wipe)				
alpha-BHC	0.2 U	0.05 U	0.05 U	0.1 U
beta-BHC	0.2 U	0.05 U	0.05 U	0.1 U
delta-BHC	0.2 U	0.05 U	0.05 U	0.1 U
gamma-BHC (Lindane)	0.2 U	0.05 U	0.05 U	0.1 U
Heptachlor	0.2 U	0.05 U	0.05 U	0.1 U
Aldrin	0.2 U	0.05 U	0.05 U	0.1 U
Heptachlor epoxide	0.2 U	0.05 U	0.05 U	0.1 U
Dieldrin	0.4 U	0.1 U	0.1 U	0.2 U
4,4'-DDE	5.5 J	1.1	1.6	0.47
Endrin	0.4 U	0.1 U	0.1 U	0.2 U
Endosulfan II	0.4 UJ	0.1 UJ	0.1 U	0.2 UJ
4,4'-DDD	0.4 UJ	0.1 UJ	0.12 J	0.2 UJ
Endosulfan sulfate	0.4 U	0.1 U	0.1 U	0.2 U
4,4'-DDT	17 D	1.4	1.1	3.7
Methoxychlor	2 UJ	0.5 UJ	0.5 UJ	1 UJ
Endrin aldehyde	0.4 U	0.1 U	0.1 U	0.2 U
Endosulfan I	0.2 U	0.05 U	0.05 U	0.1 U
Toxaphene	20 U	5 U	5 U	10 U
Aroclor-1016	4 U	1 U	1 U	2 U
Aroclor-1221	8 U	2 U	2 U	4 U
Aroclor-1232	4 U	1 U	1 U	2 U
Aroclor-1242	4 U	1 U	1 U	2 U
Aroclor-1248	4 U	1 U	1 U	2 U
Aroclor-1254	4 U	1 U	1 U	2 U
Aroclor-1260	4 U	1 U	1 U	2 U
Chlordane	2 U	0.5 U	0.5 U	1 U

APPENDIX E.9
SWMU 54, Surface Soil – Organics

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08
Site ID	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08
Sample Date	12/13/00	12/13/00	12/13/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Volatiles (ug/kg)									
Dichlorodifluoromethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 UJ	5.4 U	5.6 U	5.5 U	7.8 U
Chloromethane	11 U	11 U	13 U	11 U	11 UJ	11 U	11 U	11 U	16 U
Vinyl chloride	11 U	11 U	13 U	11 U	11 UJ	11 U	11 U	11 U	16 U
Bromomethane	11 U	11 U	13 U	11 U	11 UJ	11 U	11 U	11 U	16 U
Chloroethane	11 U	11 U	13 U	11 U	11 UJ	11 U	11 U	11 U	16 U
Trichlorofluoromethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 UJ	5.4 U	5.6 U	5.5 U	7.8 U
1,1-Dichloroethene	5.5 U	5.4 U	6.6 U	5.6 U	5.6 UJ	5.4 U	5.6 U	5.5 U	7.8 U
Methylene chloride	5.5 U	5.4 U	6.8	4.2 J	4.1 J	3.2 J	5.6 U	5.5 U	9.1
trans-1,2-Dichloroethene	5.5 U	5.4 U	6.6 U	5.6 U	5.6 UJ	5.4 U	5.6 U	5.5 U	7.8 U
1,1-Dichloroethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 UJ	5.4 U	5.6 U	5.5 U	7.8 U
Chloroform	5.5 U	5.4 U	6.6 U	5.6 U	5.6 UJ	5.4 U	5.6 U	5.5 U	7.8 U
1,1,1-Trichloroethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
Carbon tetrachloride	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
Benzene	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
1,2-Dichloroethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
Trichloroethene	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
1,2-Dichloropropane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
Bromodichloromethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
Dibromomethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
Toluene	7.8	10	2.7 J	2.1 J	5.6 U	3 J	2.7 J	4.4 J	15
1,1,2-Trichloroethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
Tetrachloroethene	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
Dibromochloromethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
1,2-Dibromoethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
Chlorobenzene	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	18	7.8 U
1,1,1,2-Tetrachloroethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
Ethylbenzene	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
Volatiles(Cont.)(ug/kg)									
Styrene	5.5 U	2.1 J	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08
Site ID	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08
Sample Date	12/13/00	12/13/00	12/13/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Bromoform	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
1,1,2,2-Tetrachloroethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
1,2,3-Trichloropropane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
1,2-Dibromo-3-chloropropane	11 U	11 U	13 U	11 U	11 U	11 U	11 U	11 U	16 U
Acrolein	110 R	110 R	130 UJ	110 UJ	110 UJ	110 UJ	110 R	110 R	160 UJ
Acetone	55 U	54 U	66 U	56 U	56 UJ	54 U	56 U	55 U	78 U
Iodomethane	5.5 U	5.4 U	6.6 U	5.6 U	5.6 UJ	5.4 U	5.6 U	5.5 U	7.8 U
Acetonitrile	220 U	220 U	260 U	220 U	220 UJ	220 U	220 U	220 U	310 U
Carbon disulfide	5.5 U	5.4 U	6.6 U	5.6 U	5.6 UJ	5.4 U	5.6 U	5.5 U	7.8 U
Vinyl acetate	11 U	11 U	13 U	11 U	11 UJ	11 U	11 U	11 U	16 U
2-Butanone	27 U	27 U	33 U	28 U	28 UJ	27 U	28 U	27 U	39 U
4-Methyl-2-pentanone	27 U	27 U	33 U	28 U	28 U	27 U	28 U	27 U	39 U
cis-1,3-Dichloropropene	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
trans-1,3-Dichloropropene	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
2-Hexanone	27 U	27 U	33 U	28 U	28 U	27 U	28 U	27 U	39 U
trans-1,4-Dichloro-2-butene	11 U	11 U	13 U	11 U	11 U	11 U	11 U	11 U	16 U
Xylenes, Total	11 U	11 U	13 U	11 U	11 U	11 U	11 U	11 U	16 U
Chloroprene	5.5 U	5.4 U	6.6 U	5.6 U	5.6 UJ	5.4 U	5.6 U	5.5 U	7.8 U
Pentachloroethane	27 U	27 U	33 U	28 U	28 UJ	27 U	28 U	27 U	39 U
Acrylonitrile	110 U	110 U	130 U	110 U	110 UJ	110 U	110 U	110 U	160 U
3-Chloro-1-Propene	5.5 U	5.4 U	6.6 U	5.6 U	5.6 UJ	5.4 U	5.6 U	5.5 U	7.8 U
Propionitrile	110 U	110 U	130 U	110 U	110 UJ	110 U	110 U	110 U	160 U
Methacrylonitrile	110 U	110 U	130 U	110 U	110 UJ	110 U	110 U	110 U	160 U
Isobutanol	220 U	220 U	260 U	220 U	220 UJ	220 U	220 U	220 U	310 U
Methyl methacrylate	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U
Ethyl methacrylate	5.5 U	5.4 U	6.6 U	5.6 U	5.6 U	5.4 U	5.6 U	5.5 U	7.8 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08
Site ID	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08
Sample Date	12/13/00	12/13/00	12/13/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Semivolatiles (ug/kg)									
Aniline	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Phenol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
bis(2-Chloroethyl)ether	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2-Chlorophenol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
1,3-Dichlorobenzene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
1,4-Dichlorobenzene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Benzyl alcohol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
1,2-Dichlorobenzene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2-Methylphenol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Bis(2-Chloroisopropyl) ether	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
N-Nitrosodi-n-propylamine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
3&4-Methylphenol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Hexachloroethane	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Nitrobenzene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Isophorone	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2-Nitrophenol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2,4-Dimethylphenol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
bis(2-Chloroethoxy)methane	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2,4-Dinitrophenol	19,000 U	18,000 U	22,000 U	19,000 U	19,000 U	18,000 U	19,000 U	19,000 U	26,000 U
1,2,4-Trichlorobenzene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Naphthalene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
4-Chloroaniline	7,500 U	7,200 U	8,700 U	7,400 U	7,400 U	7,200 U	7,400 U	7,200 U	10,000 U
Hexachlorobutadiene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
4-Chloro-3-methylphenol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2-Methylnaphthalene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Hexachlorocyclopentadiene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2,4,5-Trichlorophenol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08
Site ID	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08
Sample Date	12/13/00	12/13/00	12/13/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Semivolatiles(Cont.) (ug/kg)									
2,4,6-Trichlorophenol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2-Chloronaphthalene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2-Nitroaniline	19,000 U	18,000 U	22,000 U	19,000 U	19,000 U	18,000 U	19,000 U	19,000 U	26,000 U
Acenaphthylene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2,6-Dinitrotoluene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
3-Nitroaniline	19,000 U	18,000 U	22,000 U	19,000 U	19,000 U	18,000 U	19,000 U	19,000 U	26,000 U
Acenaphthene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2,4-Dichlorophenol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Dibenzofuran	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
4-Nitrophenol	19,000 U	18,000 U	22,000 U	19,000 U	19,000 U	18,000 U	19,000 U	19,000 U	26,000 U
2,4-Dinitrotoluene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Fluorene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2,3,4,6-Tetrachlorophenol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Dimethylphthalate	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Diethylphthalate	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
4-Chlorophenyl-Phenylether	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
4-Nitroaniline	19,000 U	18,000 U	22,000 U	19,000 U	19,000 U	18,000 U	19,000 U	19,000 U	26,000 U
4,6-Dinitro-2-methylphenol	19,000 U	18,000 U	22,000 U	19,000 U	19,000 U	18,000 U	19,000 U	19,000 U	26,000 U
N-Nitrosodiphenylamine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
4-Bromophenylphenyl ether	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Hexachlorobenzene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Pentachlorophenol	19,000 U	18,000 U	22,000 U	19,000 U	19,000 U	18,000 U	19,000 U	19,000 U	26,000 U
Phenanthrene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	220 J	5,200 U
Anthracene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Di-n-butylphthalate	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Fluoranthene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	420 J	630 J	5,200 U
Pyrene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08
Site ID	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08
Sample Date	12/13/00	12/13/00	12/13/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Semivolatiles(Cont.)(ug/kg)									
Butylbenzylphthalate	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Benzo(a)anthracene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	350 J	5,200 U
3,3'-Dichlorobenzidine	7,500 U	7,200 U	8,700 U	7,400 U	7,400 U	7,200 U	7,400 U	7,200 U	10,000 U
Chrysene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
bis(2-Ethylhexyl)phthalate	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Di-n-octylphthalate	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Benzo(b)fluoranthene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Benzo(k)fluoranthene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	560 J	5,200 U
Benzo(a)pyrene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	580 J	5,200 U
Indeno(1,2,3-cd)pyrene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Dibenzo(a,h)anthracene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Pyridine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Benzo(g,h,i)perylene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
N-Nitrosodimethylamine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
1,4-Dioxane	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2-Picoline	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Methyl methanesulfonate	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Ethyl methanesulfonate	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Acetophenone	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
a,a-Dimethylphenethylamine	760,000 U	730,000 U	880,000 U	750,000 U	750,000 U	730,000 U	750,000 U	740,000 U	####### U
2,6-Dichlorophenol	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
N-Nitrosopiperidine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
N-Nitrosodi-n-butylamine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
1,2,4,5-Tetrachlorobenzene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Pentachlorobenzene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
1-Naphthylamine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2-Naphthylamine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08
Site ID	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08
Sample Date	12/13/00	12/13/00	12/13/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Semivolatiles(Cont.)(ug/kg)									
Phenacetin	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Pentachloronitrobenzene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Pronamide	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
7,12-Dimethylbenz(a)anthracei	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
3-Methylcholanthrene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
N-Nitrosomethylethylamine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
N-Nitrosodiethylamine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
N-Nitrosopyrrolidine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
o-Toluidine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
1,4-Phenylenediamine	19,000 UJ	18,000 UJ	22,000 UJ	19,000 UJ	19,000 UJ	18,000 UJ	19,000 UJ	19,000 UJ	26,000 UJ
Hexachloropropene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Safrole	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Isosafrole	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
1,4-Naphthoquinone	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
m-Dinitrobenzene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
5-Nitro-o-toluidine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
1,3,5-Trinitrobenzene	3,800 R	3,600 R	4,300 R	3,700 R	3,700 R	3,600 R	3,700 R	3,600 R	5,200 R
4-Aminobiphenyl	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Dinoseb	3,800 UJ	3,600 UJ	4,300 UJ	3,700 UJ	3,700 UJ	3,600 UJ	3,700 UJ	3,600 UJ	5,200 UJ
4-Nitroquinoline-1-oxide	38,000 R	36,000 R	43,000 R	37,000 R	37,000 R	36,000 R	37,000 R	36,000 R	52,000 R
Methapyrilene	760,000 U	730,000 U	880,000 U	750,000 U	750,000 U	730,000 U	750,000 U	740,000 U	####### U
p-Dimethylaminoazobenzene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
2-Acetylaminofluorene	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
3,3'-Dimethylbenzidine	19,000 U	18,000 U	22,000 U	19,000 U	19,000 U	18,000 U	19,000 U	19,000 U	26,000 U
N-Nitrosomorpholine	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Aramite, Total	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Hexachlorophene	####### U	####### U	2,200,000 U	1,900,000 U	1,900,000 U	1,800,000 U	1,900,000 U	1,900,000 U	####### U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08
Site ID	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08
Sample Date	12/13/00	12/13/00	12/13/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Semivolatiles(Cont.) (ug/kg)									
Diallate, Total	3,800 U	3,600 U	4,300 U	3,700 U	3,700 U	3,600 U	3,700 U	3,600 U	5,200 U
Pesticides/PCBs (ug/kg)									
alpha-BHC	9.6 U	9.2 U	2.2 U	9.6 U	9.6 U	1.8 U	3.8 U	1.9 U	13 U
gamma-BHC (Lindane)	9.6 UJ	9.2 UJ	2.2 UJ	9.6 UJ	9.6 UJ	1.8 UJ	3.8 UJ	1.9 UJ	13 UJ
beta-BHC	9.6 U	9.2 U	2.2 U	9.6 U	9.6 U	1.8 U	3.8 U	1.9 U	13 U
Heptachlor	9.6 UJ	9.2 UJ	2.2 UJ	9.6 UJ	9.6 UJ	1.8 J	3.8 UJ	1.9 UJ	13 UJ
delta-BHC	9.6 U	9.2 U	2.2 U	9.6 U	9.6 U	1.8 U	3.8 U	1.9 U	13 U
Aldrin	9.6 UJ	9.2 UJ	2.2 UJ	9.6 UJ	9.6 UJ	1.8 UJ	3.8 UJ	1.9 UJ	13 UJ
Heptachlor epoxide	9.6 U	9.2 U	2.2 U	9.6 U	9.6 U	1.8 U	3.8 U	1.9 U	13 U
Isodrin	19 UJ	18 UJ	4.3 UJ	18 UJ	18 UJ	3.6 UJ	7.4 UJ	3.6 UJ	26 UJ
Endosulfan I	9.6 U	9.2 U	2.2 U	9.6 U	9.6 U	1.8 U	3.8 U	1.9 U	13 U
4,4'-DDE	9.1 J	51 J	9.8 J	5.4 J	9.6 J	6.7 J	28 J	22 J	3.3 J
Dieldrin	19 UJ	18 UJ	4.3 UJ	18 UJ	18 UJ	3.6 UJ	7.4 UJ	3.6 UJ	5.4 J
Chlorobenzilate	96 UJ	92 UJ	22 UJ	96 UJ	96 UJ	18 UJ	38 UJ	19 UJ	130 UJ
Endrin	19 UJ	18 UJ	4.3 UJ	18 UJ	18 UJ	3.6 UJ	7.4 UJ	3.6 UJ	26 UJ
4,4'-DDD	19 U	18 U	2.5 J	18 U	18 U	1.2 J	6.9 J	2.3 J	26 U
Endosulfan II	19 U	18 U	4.3 U	18 U	18 U	3.6 U	7.4 U	3.6 U	26 U
Kepone	960 UJ	920 UJ	220 UJ	960 UJ	960 UJ	180 UJ	380 UJ	190 UJ	1300 UJ
4,4'-DDT	19 U	15 J	4.3 U	18 U	18 U	1.7 J	2 J	4.6	2.8 J
Endrin aldehyde	19 UJ	18 UJ	4.3 UJ	18 UJ	1.9 J	3.6 UJ	7.4 UJ	3.6 UJ	26 UJ
Endosulfan sulfate	19 U	18 U	4.3 U	18 U	18 U	3.6 U	7.4 U	3.6 U	26 U
Methoxychlor	96 UJ	92 UJ	22 UJ	96 UJ	96 UJ	18 UJ	38 UJ	19 UJ	130 UJ
Aroclor-1016	190 U	180 U	43 U	180 U	180 U	36 U	74 U	36 U	260 U
Aroclor-1221	380 U	360 U	88 U	380 U	380 U	73 U	150 U	74 U	520 U
Aroclor-1232	190 U	180 U	43 U	180 U	180 U	36 U	74 U	36 U	260 U
Aroclor-1242	190 U	180 U	43 U	180 U	180 U	36 U	74 U	36 U	260 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08
Site ID	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08
Sample Date	12/13/00	12/13/00	12/13/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Pesticides/PCBs(Cont.) (ug/kg)									
Aroclor-1248	190 U	180 U	43 U	180 U	180 U	36 U	74 U	36 U	260 U
Aroclor-1254	190 U	180 U	43 U	180 U	180 U	36 U	74 U	36 U	260 U
Aroclor-1260	190 U	180 U	43 U	180 U	180 U	36 U	74 U	36 U	260 U
Chlordane	96 U	92 U	22 U	96 U	96 U	18 U	38 U	19 U	130 U
Toxaphene	960 U	920 U	220 U	960 U	960 U	180 U	380 U	190 U	1300 U
OP-Pesticides (ug/kg)									
Dimethoate	3800 U	3600 U	4300 U	3700 U	3700 U	3600 U	3700 U	3600 U	5200 U
Disulfoton	3800 U	3600 U	4300 U	3700 U	3700 U	3600 U	3700 U	3600 U	5200 U
Famphur	3800 U	3600 U	4300 U	3700 U	3700 U	3600 U	3700 U	3600 U	5200 U
Methyl parathion	3800 U	3600 U	4300 U	3700 U	3700 U	3600 U	3700 U	3600 U	5200 U
O,O,O-Triethylphosphorothioa	3800 U	3600 U	4300 U	3700 U	3700 U	3600 U	3700 U	3600 U	5200 U
Parathion	3800 U	3600 U	4300 U	3700 U	3700 U	3600 U	3700 U	3600 U	5200 U
Phorate	3800 U	3600 U	4300 U	3700 U	3700 U	3600 U	3700 U	3600 U	5200 U
Sulfotepp	3800 U	3600 U	4300 U	3700 U	3700 U	3600 U	3700 U	3600 U	5200 U
Thionazin	3800 U	3600 U	4300 U	3700 U	3700 U	3600 U	3700 U	3600 U	5200 U
Chlorinated Herbicides (ug/kg)									
2,4-D	9.4 U	9 U	11 U	9.3 U	9.3 U	9 U	9.3 U	9.1 U	13 U
2,4,5-TP	9.4 U	9 U	11 U	1.4 J	9.3 U	9 U	9.3 U	9.1 U	13 U
2,4,5-T	9.4 U	9 U	11 U	9.3 U	9.3 U	9 U	9.3 U	9.1 U	13 U
Dioxin/Furans (ug/kg)									
TCDD	0.55 U	0.57 U	0.54 U	0.66 U	0.56 U	0.56 U	0.54 U	0.56 U	0.78 U
PCDF	0.55 U	0.57 U	0.54 U	0.66 U	0.56 U	0.56 U	0.54 U	0.56 U	0.78 U
PCDD	0.55 U	0.57 U	0.54 U	0.66 U	0.56 U	0.56 U	0.54 U	0.56 U	0.78 U
HCDF	0.55 U	0.57 U	0.54 U	0.66 U	0.56 U	0.56 U	0.54 U	0.56 U	0.78 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08
Site ID	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08
Sample Date	12/13/00	12/13/00	12/13/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00	12/14/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Dioxin/Furans(Cont.) (ug/kg)									
HCDD	0.55 U	0.57 U	0.54 U	0.66 U	0.56 U	0.56 U	0.54 U	0.56 U	0.78 U
TCDF	0.55 U	0.57 U	0.54 U	0.66 U	0.56 U	0.56 U	0.54 U	0.56 U	0.78 U
TPH (mg/kg)									
Diesel Range Organics	7.5 U	5.7 J	320	33 J	95 J	47	35	28	36
Gasoline Range Organics	0.28 U	0.27 U	0.33 U	0.29 U	0.28 U	0.27 U	0.11 J	0.27 U	0.38 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00
Site ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01
Sample Date	12/14/00	12/20/00	12/20/00	12/13/00	12/14/00	12/14/00	12/13/00	12/13/00	12/15/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Volatiles (ug/kg)									
Dichlorodifluoromethane	5.5 U	6 UJ	5.6 UJ	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 UJ
Chloromethane	11 U	12 UJ	11 UJ	12 U	11 U	12 U	11 U	11 U	11 UJ
Vinyl chloride	11 U	12 UJ	11 UJ	12 U	11 U	12 U	11 U	11 U	11 UJ
Bromomethane	11 U	12 UJ	11 UJ	12 U	11 U	12 U	11 U	11 U	11 UJ
Chloroethane	11 U	12 UJ	11 UJ	12 U	11 U	12 U	11 U	11 U	11 UJ
Trichlorofluoromethane	5.5 U	6 UJ	5.6 UJ	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 UJ
1,1-Dichloroethene	5.5 U	6 UJ	5.6 UJ	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 UJ
Methylene chloride	6.4	6 UJ	5.6 UJ	5.8 U	3.7 J	4 J	5.6 U	5.5 U	5.4 UJ
trans-1,2-Dichloroethene	5.5 U	6 UJ	5.6 UJ	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 UJ
1,1-Dichloroethane	5.5 U	6 UJ	5.6 UJ	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Chloroform	5.5 U	6 UJ	5.6 UJ	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 UJ
1,1,1-Trichloroethane	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Carbon tetrachloride	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Benzene	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
1,2-Dichloroethane	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Trichloroethene	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
1,2-Dichloropropane	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Bromodichloromethane	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Dibromomethane	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Toluene	13	6 U	5.6 U	6.7	5.6 U	6.1 U	15	4.6 J	2.8 J
1,1,2-Trichloroethane	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Tetrachloroethene	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Dibromochloromethane	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
1,2-Dibromoethane	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Chlorobenzene	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
1,1,1,2-Tetrachloroethane	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Ethylbenzene	5.5 U	6 U	3.8 J	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Volatiles(Cont.)(ug/kg)									
Styrene	2.4 J	6 U	22	5.8 U	5.6 U	6.1 U	2.5 J	5.5 U	5.4 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00
Site ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01
Sample Date	12/14/00	12/20/00	12/20/00	12/13/00	12/14/00	12/14/00	12/13/00	12/13/00	12/15/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Bromoform	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
1,1,2,2-Tetrachloroethane	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
1,2,3-Trichloropropane	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
1,2-Dibromo-3-chloropropane	11 U	12 U	11 U	12 UJ	11 U	12 U	11 U	11 U	11 U
Acrolein	110 UJ	120 R	110 R	120 R	110 UJ	120 UJ	110 R	110 R	110 R
Acetone	55 U	48 J	9.6 J	58 U	4.2 J	61 U	56 U	55 U	54 U
Iodomethane	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Acetonitrile	220 U	240 U	220 U	230 U	220 U	240 U	220 U	220 U	220 U
Carbon disulfide	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Vinyl acetate	11 U	12 UJ	11 UJ	12 U	11 U	12 U	11 U	11 U	11 UJ
2-Butanone	27 U	30 UJ	28 UJ	29 U	28 U	30 U	28 U	27 U	27 UJ
4-Methyl-2-pentanone	27 U	30 U	28 U	29 U	28 U	30 U	28 U	27 U	27 U
cis-1,3-Dichloropropene	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
trans-1,3-Dichloropropene	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
2-Hexanone	27 U	30 U	28 U	29 U	28 U	30 U	28 U	27 U	27 U
trans-1,4-Dichloro-2-butene	11 U	12 U	11 U	12 UJ	11 U	12 U	11 U	11 U	11 U
Xylenes, Total	11 U	12 U	11 U	12 U	11 U	12 U	11 U	11 U	11 U
Chloroprene	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Pentachloroethane	27 U	30 U	28 U	29 UJ	28 U	30 U	28 U	27 U	27 U
Acrylonitrile	110 U	120 U	110 U	120 U	110 U	120 U	110 U	110 U	110 U
3-Chloro-1-Propene	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Propionitrile	110 U	120 U	110 U	120 U	110 U	120 U	110 U	110 U	110 U
Methacrylonitrile	110 U	120 U	110 U	120 U	110 U	120 U	110 U	110 U	110 U
Isobutanol	220 U	240 U	220 U	230 U	220 U	240 U	220 U	220 U	220 U
Methyl methacrylate	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U
Ethyl methacrylate	5.5 U	6 U	5.6 U	5.8 U	5.6 U	6.1 U	5.6 U	5.5 U	5.4 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00
Site ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01
Sample Date	12/14/00	12/20/00	12/20/00	12/13/00	12/14/00	12/14/00	12/13/00	12/13/00	12/15/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Semivolatiles (ug/kg)									
Aniline	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Phenol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
bis(2-Chloroethyl)ether	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2-Chlorophenol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
1,3-Dichlorobenzene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
1,4-Dichlorobenzene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Benzyl alcohol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
1,2-Dichlorobenzene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2-Methylphenol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Bis(2-Chloroisopropyl) ether	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
N-Nitrosodi-n-propylamine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
3&4-Methylphenol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Hexachloroethane	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Nitrobenzene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Isophorone	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2-Nitrophenol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2,4-Dimethylphenol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
bis(2-Chloroethoxy)methane	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2,4-Dinitrophenol	19000 U	2000 U	1900 U	20000 U	19000 U	21000 U	19000 U	19000 U	18000 U
1,2,4-Trichlorobenzene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Naphthalene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
4-Chloroaniline	7200 U	800 U	730 U	7700 U	7400 U	8000 U	7300 U	7200 U	7100 U
Hexachlorobutadiene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
4-Chloro-3-methylphenol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2-Methylnaphthalene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Hexachlorocyclopentadiene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2,4,5-Trichlorophenol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00
Site ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01
Sample Date	12/14/00	12/20/00	12/20/00	12/13/00	12/14/00	12/14/00	12/13/00	12/13/00	12/15/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Semivolatiles(Cont.) (ug/kg)									
2,4,6-Trichlorophenol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2-Chloronaphthalene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2-Nitroaniline	19000 U	2000 U	1900 U	20000 U	19000 U	21000 U	19000 U	19000 U	18000 U
Acenaphthylene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2,6-Dinitrotoluene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
3-Nitroaniline	19000 U	2000 U	1900 U	20000 U	19000 U	21000 U	19000 U	19000 U	18000 U
Acenaphthene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2,4-Dichlorophenol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Dibenzofuran	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
4-Nitrophenol	19000 U	2000 U	1900 U	20000 U	19000 R	21000 U	19000 U	19000 U	18000 U
2,4-Dinitrotoluene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Fluorene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2,3,4,6-Tetrachlorophenol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Dimethylphthalate	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Diethylphthalate	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
4-Chlorophenyl-Phenylether	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
4-Nitroaniline	19000 U	2000 U	1900 U	20000 U	19000 U	21000 U	19000 U	19000 U	18000 U
4,6-Dinitro-2-methylphenol	19000 U	2000 U	1900 U	20000 U	19000 U	21000 U	19000 U	19000 U	18000 U
N-Nitrosodiphenylamine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
4-Bromophenylphenyl ether	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Hexachlorobenzene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Pentachlorophenol	19000 U	2000 U	1900 U	20000 U	19000 R	21000 U	19000 U	19000 U	18000 U
Phenanthrene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Anthracene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Di-n-butylphthalate	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Fluoranthene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Pyrene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00
Site ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01
Sample Date	12/14/00	12/20/00	12/20/00	12/13/00	12/14/00	12/14/00	12/13/00	12/13/00	12/15/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Semivolatiles(Cont.)(ug/kg)									
Butylbenzylphthalate	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Benzo(a)anthracene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
3,3'-Dichlorobenzidine	7200 U	800 U	730 U	7700 U	7400 U	8000 U	7300 U	7200 U	7100 U
Chrysene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
bis(2-Ethylhexyl)phthalate	3600 U	400 U	370 U	3800 U	530 J	4000 U	3700 U	3600 U	3500 U
Di-n-octylphthalate	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Benzo(b)fluoranthene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Benzo(k)fluoranthene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Benzo(a)pyrene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Indeno(1,2,3-cd)pyrene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Dibenzo(a,h)anthracene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Pyridine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Benzo(g,h,i)perylene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
N-Nitrosodimethylamine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 UJ
1,4-Dioxane	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2-Picoline	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Methyl methanesulfonate	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Ethyl methanesulfonate	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Acetophenone	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
a,a-Dimethylphenethylamine	740000 U	81000 U	74000 U	780000 U	750000 U	820000 U	740000 U	740000 U	720000 U
2,6-Dichlorophenol	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
N-Nitrosopiperidine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 UJ
N-Nitrosodi-n-butylamine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
1,2,4,5-Tetrachlorobenzene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Pentachlorobenzene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
1-Naphthylamine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
2-Naphthylamine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00
Site ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01
Sample Date	12/14/00	12/20/00	12/20/00	12/13/00	12/14/00	12/14/00	12/13/00	12/13/00	12/15/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Semivolatiles(Cont.)(ug/kg)									
Phenacetin	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Pentachloronitrobenzene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Pronamide	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
7,12-Dimethylbenz(a)anthracer	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
3-Methylcholanthrene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
N-Nitrosomethylethylamine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
N-Nitrosodiethylamine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
N-Nitrosopyrrolidine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
o-Toluidine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
1,4-Phenylenediamine	19000 UJ	2000 U	1900 U	20000 UJ	19000 UJ	21000 UJ	19000 UJ	19000 UJ	18000 UJ
Hexachloropropene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Safrole	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Isosafrole	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
1,4-Naphthoquinone	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
m-Dinitrobenzene	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
5-Nitro-o-toluidine	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
1,3,5-Trinitrobenzene	3600 R	400 U	370 U	3800 R	3700 R	4000 R	3700 R	3600 R	3500 R
4-Aminobiphenyl	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Dinoseb	3600 UJ	400 U	370 U	3800 UJ	3700 UJ	4000 UJ	3700 UJ	3600 UJ	3500 UJ
4-Nitroquinoline-1-oxide	36000 R	4000 R	3700 R	38000 R	37000 R	40000 R	37000 R	36000 R	35000 R
Methapyrilene	740,000 U	81,000 U	74,000 U	780,000 U	750,000 U	820,000 U	740,000 U	740,000 U	720,000 U
p-Dimethylaminoazobenzene	3,600 U	400 U	370 U	3,800 U	3,700 U	4,000 U	3,700 U	3,600 U	3,500 U
2-Acetylaminofluorene	3,600 U	400 U	370 U	3,800 U	3,700 U	4,000 U	3,700 U	3,600 U	3,500 U
3,3'-Dimethylbenzidine	19,000 U	2,000 U	1,900 U	20,000 U	19,000 U	21,000 U	19,000 U	19,000 U	18,000 U
N-Nitrosomorpholine	3,600 U	400 U	370 U	3,800 U	3,700 U	4,000 U	3,700 U	3,600 U	3,500 U
Aramite, Total	3,600 U	400 U	370 U	3,800 U	3,700 U	4,000 U	3,700 U	3,600 U	3,500 U
Hexachlorophene	1,900,000 U	200,000 U	190,000 U	2,000,000 U	1,900,000 U	2,100,000 U	1,900,000 U	####### U	####### U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00
Site ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01
Sample Date	12/14/00	12/20/00	12/20/00	12/13/00	12/14/00	12/14/00	12/13/00	12/13/00	12/15/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Semivolatiles(Cont.) (ug/kg)									
Diallate, Total	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Pesticides/PCBs (ug/kg)									
alpha-BHC	9.3 U	2 U	1.9 U	9.9 U	7.6 U	2.1 U	7.6 U	3.7 U	1.8 U
gamma-BHC (Lindane)	9.3 UJ	2 U	1.9 U	9.9 UJ	7.6 UJ	2.1 UJ	7.6 UJ	3.7 UJ	1.8 U
beta-BHC	9.3 U	2 U	1.9 U	9.9 U	7.6 U	2.1 U	7.6 U	3.7 U	1.8 U
Heptachlor	9.3 UJ	2 UJ	1.9 UJ	9.9 UJ	7.6 UJ	2.1 UJ	7.6 UJ	3.7 UJ	1.8 UJ
delta-BHC	9.3 U	2 U	1.9 U	9.9 U	7.6 U	2.1 U	7.6 U	3.7 U	1.8 U
Aldrin	9.3 UJ	2 U	1.9 U	9.9 UJ	7.6 UJ	2.1 UJ	7.6 UJ	3.7 UJ	1.8 U
Heptachlor epoxide	9.3 U	2 U	1.9 U	9.9 U	7.6 U	2.1 U	7.6 U	3.7 U	1.8 U
Isodrin	18 UJ	4 U	3.7 U	19 UJ	15 UJ	4 UJ	15 UJ	7.2 UJ	3.5 U
Endosulfan I	9.3 U	2 U	1.9 U	9.9 U	7.6 U	2.1 U	7.6 U	3.7 U	1.8 U
4,4'-DDE	18 J	18	16	15 J	46 J	14 J	43 J	36 J	11
Dieldrin	18 UJ	4 U	3.7 U	19 UJ	15 UJ	4 UJ	15 UJ	7.2 UJ	3.5 U
Chlorobenzilate	93 UJ	20 UJ	19 UJ	99 UJ	76 UJ	21 UJ	76 UJ	37 UJ	18 UJ
Endrin	18 UJ	4 UJ	3.7 UJ	19 UJ	15 UJ	4 UJ	15 UJ	7.2 UJ	3.5 UJ
4,4'-DDD	18 U	2.4 J	3.7 U	19 U	15 UJ	1.1 J	3.5 J	1.9 J	1.6 J
Endosulfan II	18 U	4 UJ	3.7 UJ	19 U	15 U	4 U	15 U	7.2 U	3.5 UJ
Kepone	930 UJ	200 UJ	190 UJ	990 UJ	760 UJ	210 UJ	760 UJ	370 UJ	180 UJ
4,4'-DDT	2.3 J	1.9 J	2.1 J	3.5 J	4.5 J	1.2 J	7.5 J	5.6 J	3.4 J
Endrin aldehyde	18 UJ	4 U	3.7 U	19 UJ	15 UJ	4 UJ	15 UJ	7.2 UJ	3.5 U
Endosulfan sulfate	18 U	4 U	3.7 U	19 U	15 U	4 U	15 U	7.2 U	3.5 U
Methoxychlor	93 UJ	20 UJ	19 UJ	99 UJ	76 UJ	21 UJ	76 UJ	37 UJ	18 UJ
Aroclor-1016	180 U	40 U	37 U	190 U	150 U	40 U	150 U	72 U	35 U
Aroclor-1221	370 U	81 U	74 U	390 U	300 U	82 U	300 U	150 U	72 U
Aroclor-1232	180 U	40 U	37 U	190 U	150 U	40 U	150 U	72 U	35 U
Aroclor-1242	180 U	40 U	37 U	190 U	150 U	40 U	150 U	72 U	35 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00
Site ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01
Sample Date	12/14/00	12/20/00	12/20/00	12/13/00	12/14/00	12/14/00	12/13/00	12/13/00	12/15/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Pesticides/PCBs(Cont.) (ug/k									
Aroclor-1248	180 U	40 U	37 U	190 U	150 U	40 U	150 U	72 U	35 U
Aroclor-1254	180 U	40 U	37 U	190 U	150 U	40 U	150 U	72 U	35 U
Aroclor-1260	180 U	40 U	37 U	190 U	150 U	40 U	150 U	72 U	35 U
Chlordane	93 U	20 U	19 U	99 U	76 U	21 U	76 U	37 U	18 U
Toxaphene	930 U	200 U	190 U	990 U	760 U	210 U	760 U	370 U	180 U
OP-Pesticides (ug/kg)									
Dimethoate	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Disulfoton	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Famphur	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Methyl parathion	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
O,O,O-Triethylphosphorothioa	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Parathion	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Phorate	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Sulfotepp	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Thionazin	3600 U	400 U	370 U	3800 U	3700 U	4000 U	3700 U	3600 U	3500 U
Chlorinated Herbicides (ug/k									
2,4-D	9.1 U	10 UJ	9.2 UJ	9.6 U	9.3 U	10 U	9.2 U	9.1 U	8.9 UJ
2,4,5-TP	9.1 U	10 UJ	9.2 UJ	9.6 U	9.3 U	10 U	9.2 U	9.1 U	8.9 UJ
2,4,5-T	9.1 U	10 UJ	9.2 UJ	9.6 U	9.3 U	10 U	9.2 U	9.1 U	8.9 UJ
Dioxin/Furans (ug/kg)									
TCDD	0.55 U	0.6 U	0.56 U	0.58 U	0.56 U	0.61 U	0.56 U	0.55 U	0.54 U
PCDF	0.55 U	0.6 U	0.56 U	0.58 U	0.56 U	0.61 U	0.56 U	0.55 U	0.54 U
PCDD	0.55 U	0.6 U	0.56 U	0.58 U	0.56 U	0.61 U	0.56 U	0.55 U	0.54 U
HCDF	0.55 U	0.6 U	0.56 U	0.58 U	0.56 U	0.61 U	0.56 U	0.55 U	0.54 U

APPENDIX E.9 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00
Site ID	54SS09	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01
Sample Date	12/14/00	12/20/00	12/20/00	12/13/00	12/14/00	12/14/00	12/13/00	12/13/00	12/15/00
Depth (ft bgs)	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Dioxin/Furans(Cont.) (ug/kg)									
HCDD	0.55 U	0.6 U	0.56 U	0.58 U	0.56 U	0.61 U	0.56 U	0.55 U	0.54 U
TCDF	0.55 U	0.6 U	0.56 U	0.58 U	0.56 U	0.61 U	0.56 U	0.55 U	0.54 U
TPH (mg/kg)									
Diesel Range Organics	14	4 U	3.7 U	490	17 J	23	32	33	3.5 U
Gasoline Range Organics	0.27 U	0.33 UJ	0.29 U	0.28 UJ	0.28 U	0.32 U	0.28 UJ	0.27 U	0.27 U

APPENDIX E.10
SWMU 54, Surface Soil - Inorganics

APPENDIX E.10 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - INORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS01	54SS02	54SS03	54SS04	54SS04D	54SS05	54SS06	54SS07	54SS08	54SS09
Site ID	54SS01	54SS02	54SS03	54SS04	54SS04	54SS05	54SS06	54SS07	54SS08	54SS09
Sample Date	12/13/00	12/13/00	12/13/00	12/14/00	12/14/00	12/14/00	12/13/00	12/13/00	12/14/00	12/14/00
Depth (ft bgs)	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Metals (mg/kg)										
Antimony	2.1 UJ	0.5 J	2.4 UJ	2 UJ	2.2 UJ	2.2 UJ	2 UJ	2.2 UJ	2.8 UJ	2 UJ
Arsenic	1 U	1.4	2.2	0.95 J	0.87 J	2.7	1.4	2.3	3.4	1.3
Barium	41	39	41	59	52	36	46	41	61	45
Beryllium	0.059 J	0.15 J	0.13 J	0.13 J	0.13 J	0.15 J	0.16 J	0.16 J	0.2 J	0.16 J
Cadmium	0.22 J	0.55	0.86	0.71	0.62	1.4	1.1	1.4	0.78	0.64
Chromium	41 R	71 R	34 R	57 R	59 R	90 R	75 R	41 R	84 R	67 R
Cobalt	10	13	10	16	14	13	14	10	14	14
Copper	37 J	70 J	51 J	51 J	57 J	110 J	89 J	52 J	89 J	77 J
Lead	2.2	17	34	8.6	10	30	17	27	37	15
Mercury	0.011 R	0.038 R	0.026 R	0.044 R	0.1 R	0.11 R	0.07 R	0.022 R	0.064 R	0.058 R
Nickel	12	28	20	23	24	39	44	22	47	46
Selenium	1 U	0.99 U	1.2 U	1 U	1.1 U	1.1 U	1 U	1.1 U	1.4 U	1 U
Silver	1 U	0.38 J	1.2 U	1 U	1.1 U	1.1 U	1 U	1.1 U	1.4 U	1 U
Thallium	1 U	0.99 U	1.2 U	1 U	1.1 U	1.1 U	1 U	1.1 U	1.4 U	1 U
Tin	5.2 U	4.9 U	6 U	5.1 U	5.6 U	5.4 U	5.1 U	5.5 U	7.1 U	5 U
Vanadium	69	84	87	94	94	94	100	89	98	89
Zinc	20 J	69 J	97 J	52 J	46 J	120 J	81 J	77 J	150 J	42 J
Cyanide, Total	1.1 U	1.1 U	1.3 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.6 U	1.1 U
Sulfide	28 UJ	27 UJ	33 UJ	28 UJ	28 UJ	27 UJ	28 UJ	28 UJ	39 UJ	28 UJ

APPENDIX E.10 (continued)

SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL - INORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SS10	54SS11	54SS12	54SS13	54SS13D	54SS14	54SS15	54SB01-00
Site ID	54SS10	54SS11	54SS12	54SS13	54SS13	54SS14	54SS15	54TW01
Sample Date	12/20/00	12/20/00	12/13/00	12/14/00	12/14/00	12/13/00	12/13/00	12/15/00
Depth (ft bgs)	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Metals (mg/kg)								
Antimony	2.4 UJ	0.56 J	2.1 UJ	2.2 UJ	2.2 UJ	2.2 UJ	2.2 UJ	0.79 J
Arsenic	2	1.4	2.3	1.1 J	1.5	0.6 J	3.6	2
Barium	66	38	53	66	67	52	49	75
Beryllium	0.17 J	0.23 J	0.17 J	0.16 J	0.18 J	0.11 J	0.16 J	0.16 J
Cadmium	0.59 J	0.59	4.4	0.8	0.77	0.3 J	1.2	1.5
Chromium	96 J	98 J	98 R	74 R	75 R	81 R	51 R	68 J
Cobalt	14	13	11	11	11	14	12	13
Copper	69 J	94 J	82 J	63 J	68 J	58 J	81 J	240 J
Lead	19	19	160	25	24	5.4	39	69
Mercury	0.049 J	0.11 J	0.061 R	0.031 R	0.037 R	0.06 R	0.056 R	0.04 J
Nickel	34	59	35	30	35	24	29	25
Selenium	1.2 U	0.93 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Silver	1.2 U	0.93 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.43 J
Thallium	1.2 U	0.93 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Tin	6 U	4.6 U	5.3 U	5.6 U	5.5 U	5.6 U	5.5 U	5.4 U
Vanadium	130	100	71	98	100	87	91	110
Zinc	85 J	43 J	200 J	58 J	55 J	32 J	91 J	79 J
Cyanide, Total	1.1 U	1.1 U	1.2 U	1.1 U	1.2 U	1.1 U	1.1 U	1.1 U
Sulfide	30 UJ	28 UJ	29 UJ	28 UJ	30 UJ	28 UJ	28 UJ	27 UJ

APPENDIX E.11
SWMU 54, Subsurface Soil – Organics

APPENDIX E.11

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SB01-05	54SB01-08	54SB02-02	54SB02-06
Site ID	54TW01	54TW01	54TW02	54TW02
Sample Date	12/15/00	12/15/00	12/15/00	12/15/00
Depth (ft bgs)	8.0-10.0	14.0-16.0	2.0-4.0	10.0-12.0
Volatiles (ug/kg)				
Dichlorodifluoromethane	6.6 U	6.8 U	6.8 U	6.9 U
Chloromethane	13 U	14 U	14 U	14 U
Vinyl chloride	13 U	14 U	14 U	14 U
Bromomethane	13 U	14 U	14 U	14 U
Chloroethane	13 U	14 U	14 U	14 U
Trichlorofluoromethane	6.6 U	6.8 U	6.8 U	6.9 U
1,1-Dichloroethene	6.6 U	6.8 U	6.8 U	6.9 U
Methylene chloride	6.6 U	6.8 U	6.8 U	6.9 U
trans-1,2-Dichloroethene	6.6 U	6.8 U	6.8 U	6.9 U
1,1-Dichloroethane	6.6 U	6.8 U	6.8 U	6.9 U
Chloroform	6.6 U	6.8 U	6.8 U	6.9 U
1,1,1-Trichloroethane	6.6 U	6.8 U	6.8 U	6.9 U
Carbon tetrachloride	6.6 U	6.8 U	6.8 U	6.9 U
Benzene	6.6 U	6.8 U	6.8 U	6.9 U
1,2-Dichloroethane	6.6 U	6.8 U	6.8 U	6.9 U
Trichloroethene	6.6 U	6.8 U	6.8 U	6.9 U
1,2-Dichloropropane	6.6 U	6.8 U	6.8 U	6.9 U
Bromodichloromethane	6.6 U	6.8 U	6.8 U	6.9 U
Dibromomethane	6.6 U	6.8 U	6.8 U	6.9 U
Toluene	6.6 U	2.8 J	3.6 J	2.6 J
1,1,2-Trichloroethane	6.6 U	6.8 U	6.8 U	6.9 U
Tetrachloroethene	6.6 U	6.8 U	6.8 U	6.9 U
Dibromochloromethane	6.6 U	6.8 U	6.8 U	6.9 U
1,2-Dibromoethane	6.6 U	6.8 U	6.8 U	6.9 U
Chlorobenzene	6.6 U	6.8 U	6.8 U	6.9 U
1,1,1,2-Tetrachloroethane	6.6 U	6.8 U	6.8 U	6.9 U
Ethylbenzene	6.6 U	6.8 U	6.8 U	6.9 U
Styrene	6.6 U	6.8 U	6.8 U	6.9 U
Bromoform	6.6 U	6.8 U	6.8 U	6.9 U
1,1,2,2-Tetrachloroethane	6.6 U	6.8 U	6.8 U	6.9 U
1,2,3-Trichloropropane	6.6 U	6.8 U	6.8 U	6.9 U
1,2-Dibromo-3-chloropropane	13 U	14 U	14 U	14 U
Acrolein	130 R	140 R	140 R	140 R
Acetone	89 J	18 J	130 J	43 J
Iodomethane	6.6 U	6.8 U	6.8 U	6.9 U
Acetonitrile	260 U	270 U	270 U	280 U
Carbon disulfide	6.6 U	6.8 U	6.8 U	6.9 U
Vinyl acetate	13 U	14 U	14 U	14 U
2-Butanone	33 U	34 U	6.2 J	35 U
cis-1,3-Dichloropropene	6.6 U	6.8 U	6.8 U	6.9 U

APPENDIX E.11

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SB01-05	54SB01-08	54SB02-02	54SB02-06
Site ID	54TW01	54TW01	54TW02	54TW02
Sample Date	12/15/00	12/15/00	12/15/00	12/15/00
Depth (ft bgs)	8.0-10.0	14.0-16.0	2.0-4.0	10.0-12.0
Volatiles (Cont.) (ug/kg)				
trans-1,3-Dichloropropene	6.6 U	6.8 U	6.8 U	6.9 U
2-Hexanone	33 U	34 U	34 U	35 U
trans-1,4-Dichloro-2-butene	13 U	14 U	14 U	14 U
Xylenes, Total	13 U	14 U	14 U	14 U
Chloroprene	6.6 U	6.8 U	6.8 U	6.9 U
Pentachloroethane	33 U	34 U	34 U	35 U
Acrylonitrile	130 U	140 U	140 U	140 U
3-Chloro-1-Propene	6.6 U	6.8 U	6.8 U	6.9 U
Propionitrile	130 U	140 U	140 U	140 U
Methacrylonitrile	130 U	140 U	140 U	140 U
Isobutanol	260 U	270 U	270 U	280 U
Methyl methacrylate	6.6 U	6.8 U	6.8 U	6.9 U
Ethyl methacrylate	6.6 U	6.8 U	6.8 U	6.9 U
Semivolatiles (ug/kg)				
Aniline	430 U	450 U	440 U	460 U
Phenol	430 U	450 U	440 U	460 U
bis(2-Chloroethyl)ether	430 U	450 U	440 U	460 U
2-Chlorophenol	430 U	450 U	440 U	460 U
1,3-Dichlorobenzene	430 U	450 U	440 U	460 U
1,4-Dichlorobenzene	430 U	450 U	440 U	460 U
Benzyl alcohol	430 U	450 U	440 U	460 U
1,2-Dichlorobenzene	430 U	450 U	440 U	460 U
2-Methylphenol	430 U	450 U	440 U	460 U
Bis(2-Chloroisopropyl) ether	430 U	450 U	440 U	460 U
N-Nitrosodi-n-propylamine	430 U	450 U	440 U	460 U
3&4-Methylphenol	430 U	450 U	440 U	460 U
Hexachloroethane	430 U	450 U	440 U	460 U
Nitrobenzene	430 U	450 U	440 U	460 U
Isophorone	430 U	450 U	440 U	460 U
2-Nitrophenol	430 U	450 U	440 U	460 U
2,4-Dimethylphenol	430 U	450 U	440 U	460 U
bis(2-Chloroethoxy)methane	430 U	450 U	440 U	460 U
2,4-Dinitrophenol	2,200 U	2,300 U	2,300 U	2,400 U
1,2,4-Trichlorobenzene	430 U	450 U	440 U	460 U
Naphthalene	430 U	450 U	440 U	460 U
4-Chloroaniline	870 U	900 U	890 U	920 U
Hexachlorobutadiene	430 U	450 U	440 U	460 U
4-Chloro-3-methylphenol	430 U	450 U	440 U	460 U
2-Methylnaphthalene	430 U	450 U	440 U	460 U

APPENDIX E.11

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SB01-05	54SB01-08	54SB02-02	54SB02-06
Site ID	54TW01	54TW01	54TW02	54TW02
Sample Date	12/15/00	12/15/00	12/15/00	12/15/00
Depth (ft bgs)	8.0-10.0	14.0-16.0	2.0-4.0	10.0-12.0
Semivolatiles(Cont.) (ug/kg)				
Hexachlorocyclopentadiene	430 U	450 U	440 U	460 U
2,4,5-Trichlorophenol	430 U	450 U	440 U	460 U
2,4,6-Trichlorophenol	430 U	450 U	440 U	460 U
2-Chloronaphthalene	430 U	450 U	440 U	460 U
2-Nitroaniline	2,200 U	2,300 U	2,300 U	2,400 U
Acenaphthylene	430 U	450 U	440 U	460 U
2,6-Dinitrotoluene	430 U	450 U	440 U	460 U
3-Nitroaniline	2,200 U	2,300 U	2,300 U	2,400 U
Acenaphthene	430 U	450 U	440 U	460 U
2,4-Dichlorophenol	430 U	450 U	440 U	460 U
Dibenzofuran	430 U	450 U	440 U	460 U
4-Nitrophenol	2,200 U	2,300 U	2,300 U	2,400 U
2,4-Dinitrotoluene	430 U	450 U	440 U	460 U
Fluorene	430 U	450 U	440 U	460 U
2,3,4,6-Tetrachlorophenol	430 U	450 U	440 U	460 U
Dimethylphthalate	430 U	450 U	440 U	460 U
Diethylphthalate	430 U	450 U	440 U	460 U
4-Chlorophenyl-Phenylether	430 U	450 U	440 U	460 U
4-Nitroaniline	2,200 U	2,300 U	2,300 U	2,400 U
4,6-Dinitro-2-methylphenol	2,200 U	2,300 U	2,300 U	2,400 U
N-Nitrosodiphenylamine	430 U	450 U	440 U	460 U
4-Bromophenylphenyl ether	430 U	450 U	440 U	460 U
Hexachlorobenzene	430 U	450 U	440 U	460 U
Pentachlorophenol	2,200 U	2,300 U	2,300 U	2,400 U
Phenanthrene	430 U	450 U	440 U	460 U
Anthracene	430 U	450 U	440 U	460 U
Di-n-butylphthalate	430 U	57 J	440 U	460 U
Fluoranthene	430 U	450 U	440 U	460 U
Pyrene	430 U	450 U	440 U	460 U
Butylbenzylphthalate	430 U	450 U	440 U	460 U
Benzo(a)anthracene	430 U	450 U	440 U	460 U
3,3'-Dichlorobenzidine	870 U	900 U	890 U	920 U
Chrysene	430 U	450 U	440 U	460 U
bis(2-Ethylhexyl)phthalate	430 U	150 U	440 U	460 U
Di-n-octylphthalate	430 U	450 U	440 U	460 U
Benzo(b)fluoranthene	430 U	450 U	440 U	460 U
Benzo(k)fluoranthene	430 U	450 U	440 U	460 U
Benzo(a)pyrene	430 U	450 U	440 U	460 U
Indeno(1,2,3-cd)pyrene	430 U	450 U	440 U	460 U
Dibenzo(a,h)anthracene	430 U	450 U	440 U	460 U

APPENDIX E.11

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SB01-05	54SB01-08	54SB02-02	54SB02-06
Site ID	54TW01	54TW01	54TW02	54TW02
Sample Date	12/15/00	12/15/00	12/15/00	12/15/00
Depth (ft bgs)	8.0-10.0	14.0-16.0	2.0-4.0	10.0-12.0
Semivolatiles(Cont.) (ug/kg)				
Pyridine	430 U	450 U	440 U	460 U
Benzo(g,h,i)perylene	430 U	450 U	440 U	460 UJ
N-Nitrosodimethylamine	430 UJ	450 UJ	440 UJ	460 U
1,4-Dioxane	430 U	450 U	440 U	460 U
2-Picoline	430 U	450 U	440 U	460 U
Methyl methanesulfonate	430 U	450 U	440 U	460 U
Ethyl methanesulfonate	430 U	450 U	440 U	460 U
Acetophenone	430 U	450 U	440 U	460 U
a,a-Dimethylphenethylamine	88,000 U	92,000 U	90,000 U	93,000 U
2,6-Dichlorophenol	430 U	450 U	440 U	460 UJ
N-Nitrosopiperidine	430 UJ	450 UJ	440 UJ	460 U
N-Nitrosodi-n-butylamine	430 U	450 U	440 U	460 U
1,2,4,5-Tetrachlorobenzene	430 U	450 U	440 U	460 U
Pentachlorobenzene	430 U	450 U	440 U	460 U
1-Naphthylamine	430 U	450 U	440 U	460 U
2-Naphthylamine	430 U	450 U	440 U	460 U
Phenacetin	430 U	450 U	440 U	460 U
Pentachloronitrobenzene	430 U	450 U	440 U	460 U
Pronamide	430 U	450 U	440 U	460 U
7,12-Dimethylbenz(a)anthracen	430 U	450 U	440 U	460 U
3-Methylcholanthrene	430 U	450 U	440 U	460 U
N-Nitrosomethylethylamine	430 U	450 U	440 U	460 U
N-Nitrosodiethylamine	430 U	450 U	440 U	460 U
N-Nitrosopyrrolidine	430 U	450 U	440 U	460 U
o-Toluidine	430 U	450 U	440 U	460 UJ
1,4-Phenylenediamine	2,200 UJ	2,300 UJ	2,300 UJ	2,400 U
Hexachloropropene	430 U	450 U	440 U	460 U
Safrole	430 U	450 U	440 U	460 U
Isosafrole	430 U	450 U	440 U	460 U
1,4-Naphthoquinone	430 U	450 U	440 U	460 U
m-Dinitrobenzene	430 U	450 U	440 U	460 U
5-Nitro-o-toluidine	430 U	450 U	440 U	460 R
1,3,5-Trinitrobenzene	430 R	450 R	440 R	460 U
4-Aminobiphenyl	430 U	450 U	440 U	460 UJ
Dinoseb	430 UJ	450 UJ	440 UJ	460 R
4-Nitroquinoline-1-oxide	4,300 R	4,500 R	4,400 R	4,600 U
Methapyrilene	88,000 U	92,000 U	90,000 U	93,000 U
p-Dimethylaminoazobenzene	430 U	450 U	440 U	460 U
2-Acetylaminofluorene	430 U	450 U	440 U	460 U
3,3'-Dimethylbenzidine	2,200 U	2,300 U	2,300 U	2,400 U

APPENDIX E.11

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SB01-05	54SB01-08	54SB02-02	54SB02-06
Site ID	54TW01	54TW01	54TW02	54TW02
Sample Date	12/15/00	12/15/00	12/15/00	12/15/00
Depth (ft bgs)	8.0-10.0	14.0-16.0	2.0-4.0	10.0-12.0
Semivolatiles(Cont.) (ug/kg)				
N-Nitrosomorpholine	430 U	450 U	440 U	460 U
Aramite, Total	430 U	450 U	440 U	460 U
Hexachlorophene	220,000 U	230,000 U	230,000 U	240,000 U
Diallate, Total	430 U	450 U	440 U	460 U
Pesticides/PCBs (ug/kg)				
alpha-BHC	2.2 U	2.3 U	2.3 U	2.4 U
gamma-BHC (Lindane)	2.2 U	2.3 U	2.3 U	2.4 U
beta-BHC	2.2 U	2.3 U	2.3 U	2.4 UJ
Heptachlor	2.2 UJ	2.3 UJ	2.3 UJ	2.4 U
delta-BHC	2.2 U	2.3 U	2.3 U	2.4 U
Aldrin	2.2 U	2.3 U	2.3 U	2.4 U
Heptachlor epoxide	2.2 U	2.3 U	2.3 U	2.4 U
Isodrin	4.3 U	4.5 U	4.4 U	4.6 U
Endosulfan I	2.2 U	2.3 U	2.3 U	2.4 U
4,4'-DDE	4.3 U	4.5 U	1.5 J	4.6 U
Dieldrin	4.3 U	4.5 U	4.4 U	4.6 UJ
Chlorobenzilate	22 UJ	23 UJ	23 UJ	24 UJ
Endrin	4.3 UJ	4.5 UJ	4.4 UJ	4.6 U
4,4'-DDD	4.3 U	4.5 U	0.67 J	4.6 UJ
Endosulfan II	4.3 UJ	4.5 UJ	4.4 UJ	4.6 UJ
Kepone	220 UJ	230 UJ	230 UJ	240 UJ
4,4'-DDT	4.3 UJ	4.5 UJ	4.4 UJ	4.6 U
Endrin aldehyde	4.3 U	4.5 U	4.4 U	4.6 U
Endosulfan sulfate	4.3 U	4.5 U	4.4 U	4.6 UJ
Methoxychlor	22 UJ	23 UJ	23 UJ	24 U
Aroclor-1016	43 U	45 U	44 U	46 U
Aroclor-1221	88 U	92 U	90 U	93 U
Aroclor-1232	43 U	45 U	44 U	46 U
Aroclor-1242	43 U	45 U	44 U	46 U
Aroclor-1248	43 U	45 U	44 U	46 U
Aroclor-1254	43 U	45 U	44 U	46 U
Aroclor-1260	43 U	45 U	44 U	46 U
Chlordane	22 U	23 U	23 U	24 U
Toxaphene	220 U	230 U	230 U	240 U

APPENDIX E.11

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SB01-05	54SB01-08	54SB02-02	54SB02-06
Site ID	54TW01	54TW01	54TW02	54TW02
Sample Date	12/15/00	12/15/00	12/15/00	12/15/00
Depth (ft bgs)	8.0-10.0	14.0-16.0	2.0-4.0	10.0-12.0
OP-Pesticides (ug/kg)				
Dimethoate	430 U	450 U	440 U	460 U
Disulfoton	430 U	450 U	440 U	460 U
Famphur	430 U	450 U	440 U	460 U
OP-Pesticides(Cont.) (ug/kg)				
Methyl parathion	430 U	450 U	440 U	460 U
O,O,O-Triethylphosphorothioat	430 U	450 U	440 U	460 U
Parathion	430 U	450 U	440 U	460 U
Phorate	430 U	450 U	440 U	460 U
Sulfotepp	430 U	450 U	440 U	460 U
Thionazin	430 U	450 U	440 U	460 UJ
Chlorinated Herbicides (ug/kg)				
2,4-D	11 UJ	11 UJ	11 UJ	12 UJ
2,4,5-TP	11 UJ	11 UJ	11 UJ	12 UJ
2,4,5-T	11 UJ	1.7 J	11 UJ	12 U
Dioxin/Furans (ug/kg)				
TCDD	0.66 U	0.68 U	0.68 U	0.69 U
PCDF	0.66 U	0.68 U	0.68 U	0.69 U
PCDD	0.66 U	0.68 U	0.68 U	0.69 U
HCDF	0.66 U	0.68 U	0.68 U	0.69 U
HCDD	0.66 U	0.68 U	0.68 U	0.69 U
TCDF	0.66 U	0.68 U	0.68 U	0.69 U
TPH (mg/kg)				
Diesel Range Organics	4.3 U	5.6 U	4.6 U	4.6 U
Gasoline Range Organics	0.33 U	0.35 U	0.34 U	0.36 U

APPENDIX E.12
SWMU 54, Subsurface Soil - Inorganics

APPENDIX E.12

SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL - INORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SB01-05	54SB01-08	54SB02-02	54SB02-06
Site ID	54TW01	54TW01	54TW02	54TW02
Sample Date	12/15/00	12/15/00	12/15/00	12/15/00
Depth (ft bgs)	8.0-10.0	14.0-16.0	2.0-4.0	10.0-12.0
Metals (mg/kg)				
Antimony	2.6 UJ	2.7 UJ	2.7 UJ	2.5 UJ
Arsenic	1.5	1 J	1.3 J	1.3 U
Barium	44	220	120	35
Beryllium	0.75	2.4	0.63	0.23 J
Cadmium	1.8	0.75	0.9	0.78
Chromium	100 J	6.2 J	40 J	10 J
Cobalt	23	34	30	2.9
Copper	160 J	140 J	82 J	61 J
Lead	5.9	1.6	4.4	1.3
Mercury	0.011 J	0.0065 J	0.13 J	0.028 U
Nickel	12	7.6	7.6	1.7 J
Selenium	0.76 J	1.4 U	2.2	1.3 U
Silver	1.3 U	1.4 U	1.4 U	1.3 U
Thallium	2.6 U	1.4 U	1.4 U	1.3 U
Tin	6.6 U	6.8 U	6.8 U	6.3 U
Vanadium	450	120	230	140
Zinc	57 J	82 J	31 J	15 J
Cyanide, Total	1.3 U	1.4 U	1.3 U	1.4 U
Sulfide	33 UJ	34 UJ	34 UJ	35 UJ

APPENDIX E.13
SWMU 54, Groundwater – Organics

APPENDIX E.13

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	510-MW1	510-MW2	510-MW2D	510-MW3	510-MW4	510-MW5	510-DW1	510-DW2	54TW01	54TW02
Sample Date	12/15/00	12/19/00	12/19/00	12/19/00	12/18/00	12/21/00	12/19/00	12/19/00	12/20/00	12/19/00
Volatiles (ug/L)										
Dichlorodifluoromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U	5 U	5 U	0.61 J	5 U	5 U	5 U	5 U
Methylene chloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U	5.8	5 U	1.4 J	5 U	1.2 J	5 U	5 U
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	5 U	5 U	5 U	5 U	5 U	5 U	91	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	0.86 J	5 U	5 U	5 U	3 J	5 U	5 U
Trichloroethene	5 U	5 U	5 U	5.9	5 U	230 D	5 U	1.1 J	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromomethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	5 U	5 U	5 U	5 U	5 U	5 U	3.7 J	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromoethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

APPENDIX E.13 (continued)

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	510-MW1	510-MW2	510-MW2D	510-MW3	510-MW4	510-MW5	510-DW1	510-DW2	54TW01	54TW02
Sample Date	12/15/00	12/19/00	12/19/00	12/19/00	12/18/00	12/21/00	12/19/00	12/19/00	12/20/00	12/19/00
Volatiles (Cont.) (ug/L)										
1,1,1,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U	32	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,3-Trichloropropane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acrolein	100 R	100 R	100 R	100 R	100 R	100 R	100 R	100 R	100 R	100 R
Acetone	50 U	50 U	50 U	50 U	50 U	50 U	40 J	50 U	50 U	50 U
Iodomethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetonitrile	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
Carbon disulfide	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl acetate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	25 U	25 U	25 U	25 U	25 U	25 U	26	25 U	25 U	25 U
4-Methyl-2-pentanone	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
trans-1,4-Dichloro-2-butene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes, Total	10 U	10 U	10 U	10 U	10 U	10 U	19	10 U	10 U	10 U
Chloroprene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Pentachloroethane	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Acrylonitrile	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
3-Chloro-1-Propene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

APPENDIX E.13 (continued)

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	510-MW1	510-MW2	510-MW2D	510-MW3	510-MW4	510-MW5	510-DW1	510-DW2	54TW01	54TW02
Sample Date	12/15/00	12/19/00	12/19/00	12/19/00	12/18/00	12/21/00	12/19/00	12/19/00	12/20/00	12/19/00
Volatiles (Cont.) (ug/L)										
Propionitrile	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
Methacrylonitrile	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
Isobutanol	200 R	200 R	200 R	200 R	200 R	200 R	2900 J	200 R	200 R	200 R
Methyl methacrylate	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Ethyl methacrylate	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Semivolatiles (ug/L)										
Aniline	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Phenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzyl alcohol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroisopropyl) ether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodi-n-propylamine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3&4-Methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

APPENDIX E.13 (continued)

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	510-MW1	510-MW2	510-MW2D	510-MW3	510-MW4	510-MW5	510-DW1	510-DW2	54TW01	54TW02
Sample Date	12/15/00	12/19/00	12/19/00	12/19/00	12/18/00	12/21/00	12/19/00	12/19/00	12/20/00	12/19/00
Semivolatiles(Cont.) (ug/L)										
Naphthalene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Hexachlorobutadiene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	10 U	10 U	10 U	10 U	10 U	10 U	0.4 J	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chloronaphthalene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Acenaphthylene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Acenaphthene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzofuran	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitrophenol	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
2,4-Dinitrotoluene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,3,4,6-Tetrachlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dimethylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U	0.52 J	10 U	10 U	0.6 J	10 U	0.68 J	10 U
4-Chlorophenyl-Phenylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
4,6-Dinitro-2-methylphenol	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
N-Nitrosodiphenylamine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Bromopheny-phenylether	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2.2 J

APPENDIX E.13 (continued)

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	510-MW1	510-MW2	510-MW2D	510-MW3	510-MW4	510-MW5	510-DW1	510-DW2	54TW01	54TW02
Sample Date	12/15/00	12/19/00	12/19/00	12/19/00	12/18/00	12/21/00	12/19/00	12/19/00	12/20/00	12/19/00
Semivolatiles(Cont.) (ug/L)										
Hexachlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorophenol	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Phenanthrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Anthracene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	10 U	10 U	0.44 J	10 U	10 U	2.4 J	10 U	10 U	10 U	10 U
Pyrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Butylbenzylphthalate	0.77 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)anthracene	0.95 J	10 U	0.86 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Chrysene	1.5 J	10 U	1.2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	10 U	10 U	10 U	3.9 J	10 U	10 U	10 U
Di-n-octylphthalate	0.89 J	0.68 J	0.87 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	1.7 J	0.73 J	0.76 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	1.5 J	1 J	1.1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzo(a)pyrene	2 J	1 J	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	2.5 J	1.3 J	1.2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenzo(a,h)anthracene	2.7 J	1.2 J	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pyridine	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Benzo(g,h,i)perylene	2.9 J	1.6 J	1.5 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodimethylamine	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dioxane	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Picoline	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl methanesulfonate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethyl methanesulfonate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetophenone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
a,a-Dimethylphenethylamine	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U

APPENDIX E.13 (continued)

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	510-MW1	510-MW2	510-MW2D	510-MW3	510-MW4	510-MW5	510-DW1	510-DW2	54TW01	54TW02
Sample Date	12/15/00	12/19/00	12/19/00	12/19/00	12/18/00	12/21/00	12/19/00	12/19/00	12/20/00	12/19/00
Semivolatiles(Cont.) (ug/L)										
2,6-Dichlorophenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosopiperidine	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitroso-di-n-butylamine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4,5-Tetrachlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pentachlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1-Naphthylamine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Naphthylamine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Phenacetin	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pentachloronitrobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pronamide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
7,12-Dimethylbenz(a)anthracen	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3-Methylcholanthrene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosomethylethylamine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosodiethylamine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-Nitrosopyrrolidine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
o-Toluidine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Phenylenediamine	2000 UJ	2000 UJ	2000 UJ	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U
Hexachloropropene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Safrole	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Isosafrole	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Naphthoquinone	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
m-Dinitrobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
5-Nitro-o-toluidine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3,5-Trinitrobenzene	10 R	10 R	10 R	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Aminobiphenyl	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dinoseb	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Nitroquinoline-1-oxide	20 R	20 R	20 R	20 R	20 R	20 R	20 R	20 R	20 R	20 R

APPENDIX E.13 (continued)

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	510-MW1	510-MW2	510-MW2D	510-MW3	510-MW4	510-MW5	510-DW1	510-DW2	54TW01	54TW02
Sample Date	12/15/00	12/19/00	12/19/00	12/19/00	12/18/00	12/21/00	12/19/00	12/19/00	12/20/00	12/19/00
Semivolatiles(Cont.) (ug/L)										
Methapyrilene	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U	2000 U
p-Dimethylaminoazobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Acetylaminofluorene	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-Dimethylbenzidine	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
N-Nitrosomorpholine	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Aramite, Total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorophene	5000 U	5000 U	5000 U	5000 U	5000 U	5000 U	5000 U	5000 U	5000 U	5000 U
Diallate, Total	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Pesticides/PCBs (ug/L)										
alpha-BHC	0.05 U	0.05 R	0.05 R	0.05 R	0.05 UJ	0.05 U	0.05 R	0.05 U	0.05 R	0.05 R
gamma-BHC (Lindane)	0.05 U	0.05 R	0.05 R	0.05 R	0.05 UJ	0.05 U	0.05 R	0.05 U	0.05 R	0.05 R
beta-BHC	0.05 U	0.05 R	0.05 R	0.05 R	0.05 UJ	0.05 U	0.05 R	0.05 U	0.05 R	0.05 R
Heptachlor	0.05 UJ	0.05 R	0.05 R	0.05 R	0.05 UJ	0.05 UJ	0.05 R	0.05 UJ	0.05 R	0.05 R
delta-BHC	0.05 U	0.05 R	0.05 R	0.05 R	0.05 UJ	0.05 U	0.05 R	0.05 U	0.05 R	0.05 R
Aldrin	0.05 U	0.05 R	0.05 R	0.05 R	0.05 UJ	0.05 U	0.05 R	0.05 U	0.05 R	0.05 R
Heptachlor epoxide	0.05 U	0.05 R	0.05 R	0.05 R	0.05 UJ	0.05 UJ	0.05 R	0.05 U	0.05 R	0.05 R
Isodrin	0.05 U	0.05 R	0.05 R	0.05 R	0.05 UJ	0.05 U	0.05 R	0.05 U	0.05 R	0.05 R
Endosulfan I	0.05 UJ	0.05 R	0.05 R	0.05 R	0.05 UJ	0.05 U	0.05 R	0.05 UJ	0.05 R	0.05 R
4,4'-DDE	0.1 U	0.1 R	0.1 R	0.1 R	0.1 UJ	0.1 U	0.1 R	0.1 UJ	0.1 R	0.1 R
Dieldrin	0.1 UJ	0.1 R	0.1 R	0.1 R	0.1 UJ	0.1 UJ	0.1 R	0.1 UJ	0.1 R	0.1 R
Chlorobenzilate	0.5 UJ	0.5 R	0.5 R	0.5 R	0.5 UJ	0.5 U	0.5 R	0.5 UJ	0.5 R	0.5 R
Endrin	0.1 UJ	0.1 R	0.1 R	0.1 R	0.1 UJ	0.1 UJ	0.1 R	0.1 UJ	0.1 R	0.1 R
4,4'-DDD	0.1 UJ	0.1 R	0.1 R	0.1 R	0.1 UJ	0.1 U	0.1 R	0.1 UJ	0.1 R	0.1 R
Endosulfan II	0.1 U	0.1 R	0.1 R	0.1 R	0.1 UJ	0.1 U	0.1 R	0.1 U	0.1 R	0.1 R
Kepone	1 UJ	1 R	1 R	1 R	1 UJ	1 UJ	1 R	1 UJ	1 R	1 R
4,4'-DDT	0.1 UJ	0.1 R	0.1 R	0.1 R	0.1 UJ	0.1 UJ	0.1 R	0.1 UJ	0.1 R	0.1 R

APPENDIX E.13 (continued)

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	510-MW1	510-MW2	510-MW2D	510-MW3	510-MW4	510-MW5	510-DW1	510-DW2	54TW01	54TW02
Sample Date	12/15/00	12/19/00	12/19/00	12/19/00	12/18/00	12/21/00	12/19/00	12/19/00	12/20/00	12/19/00
Pesticides/PCBs(Cont.)(ug/L)										
Endrin aldehyde	0.1 UJ	0.1 R	0.1 R	0.1 R	0.1 UJ	0.1 U	0.1 R	0.1 UJ	0.1 R	0.1 R
Endosulfan sulfate	0.1 U	0.1 R	0.1 R	0.1 R	0.1 UJ	0.1 U	0.1 R	0.1 U	0.1 R	0.1 R
Methoxychlor	0.5 UJ	0.5 R	0.5 R	0.5 R	0.5 UJ	0.5 UJ	0.5 R	0.5 UJ	0.5 R	0.5 R
Aroclor-1016	1 U	1 R	1 R	1 R	1 UJ	1 U	1 R	1 U	1 R	1 R
Aroclor-1221	2 U	2 R	2 R	2 R	2 UJ	2 U	2 R	2 U	2 R	2 R
Aroclor-1232	1 U	1 R	1 R	1 R	1 UJ	1 U	1 R	1 U	1 R	1 R
Aroclor-1242	1 U	1 R	1 R	1 R	1 UJ	1 U	1 R	1 U	1 R	1 R
Aroclor-1248	1 U	1 R	1 R	1 R	1 UJ	1 U	1 R	1 U	1 R	1 R
Aroclor-1254	1 U	1 R	1 R	1 R	1 UJ	1 U	1 R	1 U	1 R	1 R
Aroclor-1260	1 U	1 R	1 R	1 R	1 UJ	1 U	1 R	1 U	1 R	1 R
Chlordane	0.5 U	0.5 R	0.5 R	0.5 R	0.5 UJ	0.5 U	0.5 R	0.5 U	0.5 R	0.5 R
Toxaphene	5 U	5 R	5 R	5 R	5 UJ	5 U	5 R	5 U	5 R	5 R
OP-Pesticides (ug/L)										
Dimethoate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Disulfoton	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Famphur	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl parathion	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
O,O,O-Triethylphosphorothioa	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Parathion	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Phorate	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sulfotepp	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Thionazin	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

APPENDIX E.13 (continued)

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	510-MW1	510-MW2	510-MW2D	510-MW3	510-MW4	510-MW5	510-DW1	510-DW2	54TW01	54TW02
Sample Date	12/15/00	12/19/00	12/19/00	12/19/00	12/18/00	12/21/00	12/19/00	12/19/00	12/20/00	12/19/00
Chlorinated Herbicides (ug/L)										
2,4-D	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2,4,5-TP	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2,4,5-T	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dioxin/Furans (ug/L)										
TCDD	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
PCDF	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
PCDD	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
HCDF	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
HCDD	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
TCDF	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
TPH (mg/L)										
Diesel Range Organics	0.33	0.2	0.21	0.37	0.84	0.1 U	1.2	0.59	6.7	1.6
Gasoline Range Organics	0.036 J	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.84	0.05 U	0.13	0.05 U

APPENDIX E.14
SWMU 54, Groundwater – Total Inorganics

APPENDIX E.14

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER - INORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	510-MW1	510-MW2	510-MW2D	510-MW3	510-MW4	510-MW5	510-DW1	510-DW2	54TW01	54TW02
Sample Date	12/15/00	12/19/00	12/19/00	12/18/00	12/18/00	12/21/00	12/18/00	12/18/00	12/20/00	12/19/00
Metals (mg/L)										
Antimony	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Arsenic	0.01 U	0.01 U	0.01 U	0.01 U	0.0044 J	0.0095 J	0.01 U	0.01 U	0.006 J	0.0046 J
Barium	0.22	0.28	0.17	0.14	0.16	0.22	0.35	0.04	1.5	0.82
Beryllium	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.014	0.0019 J
Cadmium	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.0017 J	0.0029 J
Chromium	0.0061 J	0.011	0.0087 J	0.0094 J	0.0074 J	0.01	0.01 U	0.01 U	0.026	0.066
Cobalt	0.0034 J	0.017	0.0092 J	0.0046 J	0.0059 J	0.019	0.0063 J	0.01 U	0.31	0.025
Copper	0.011 J	0.025	0.011 J	0.0098 J	0.027	0.048	0.0084 J	0.02 U	0.61	0.52
Lead	0.005 U	0.0017 J	0.005 U	0.005 U	0.0023 J	0.0089	0.005 U	0.005 U	0.0042 J	0.015
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0002 UJ	0.0001 J	0.0002 UJ	0.0002 UJ
Nickel	0.04 U	0.013 J	0.0083 J	0.04 U	0.04 U	0.0074 J	0.04 U	0.04 U	0.036 J	0.017 J
Selenium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Thallium	0.01 U	0.0054 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Tin	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.0083 J	0.017 J
Vanadium	0.015	0.11	0.059	0.019	0.062	0.068	0.0084 J	0.028	0.41	0.82
Zinc	0.0061 J	0.045	0.022	0.031	0.027	0.29	0.13	0.02 U	0.72	0.16
Cyanide, Tota	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	0.01 U	0.01 U	0.5 U	1 U
Sulfide	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ

APPENDIX E.15
SWMU 54, Groundwater Quality

APPENDIX E.15

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER, WATER QUALITY
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	510-MW1	510-MW2
Sample Date	12/20/00	12/20/00
Groundwater Quality		
Chloride (mg/L)	27	140
Color (PCU)	5	5
Fluoride (mg/L)	0.47	0.45
Langlier Index (l)	1.6	1.3
Odor (TON)	2	1
Salinity (ppt)	2 U	2 U
Sulfate as SO4 (mg/L)	19	70
Total Dissolved Solids (mg/	520	990
Aluminum (mg/L)	2.7	34
Iron (mg/L)	3.7	37
Manganese (mg/L)	0.24 J	0.99 J
Hardness as CaCO3 (mg/L)	410	230
Copper	0.011 B	0.025
Silver	0.01 U	0.01 U
Zinc	0.0061 B	0.045

APPENDIX E.16
SWMU 54, Standing Water – Organics

APPENDIX E.16

SUMMARY OF ANALYTICAL RESULTS IN STANDING WATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SW01	54SW01D	54SW02
Sample Date	12/16/00	12/16/00	12/16/00
Volatiles (ug/L)			
Dichlorodifluoromethane	5 U	5 U	5 U
Chloromethane	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U
Trichlorofluoromethane	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U
Methylene chloride	5 U	5 U	5 U
trans-1,2-Dichloroethene	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U
1,1,1-Trichloroethane	5 U	5 U	5 U
Carbon tetrachloride	5 U	5 U	5 U
Benzene	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U
Dibromomethane	5 U	5 U	5 U
Toluene	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	5 U
1,2-Dibromoethane	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U
1,1,1,2-Tetrachloroethane	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U
Styrene	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U
1,2,3-Trichloropropane	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	5 U	5 U	5 U
Acrolein	100 R	100 R	100 R
Acetone	50 U	50 U	50 U
Iodomethane	5 U	5 U	5 U
Acetonitrile	200 U	200 U	200 U

APPENDIX E.16 (continued)

SUMMARY OF ANALYTICAL RESULTS IN STANDING WATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SW01	54SW01D	54SW02
Sample Date	12/16/00	12/16/00	12/16/00
Volatiles(Cont.) (ug/L)			
Carbon disulfide	5 U	5 U	5 U
Vinyl acetate	10 U	10 U	10 U
2-Butanone	25 U	25 U	25 U
4-Methyl-2-pentanone	25 U	25 U	25 U
cis-1,3-Dichloropropene	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U
2-Hexanone	25 U	25 U	25 U
trans-1,4-Dichloro-2-butene	10 U	10 U	10 U
Xylenes, Total	10 U	10 U	10 U
Chloroprene	5 U	5 U	5 U
Pentachloroethane	25 U	25 U	25 U
Acrylonitrile	100 U	100 U	100 U
3-Chloro-1-Propene	5 U	5 U	5 U
Propionitrile	100 U	100 U	100 U
Methacrylonitrile	100 U	100 U	100 U
Isobutanol	200 R	200 R	200 R
Methyl methacrylate	5 U	5 U	5 U
Ethyl methacrylate	5 U	5 U	5 U
Semivolatiles (ug/L)			
Aniline	20 U	20 U	20 U
Phenol	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U
Benzyl alcohol	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 U
Bis(2-Chloroisopropyl) ether	10 U	10 U	10 U
N-Nitrosodi-n-propylamine	10 U	10 U	10 U
3&4-Methylphenol	10 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U

APPENDIX E.16 (continued)

SUMMARY OF ANALYTICAL RESULTS IN STANDING WATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SW01	54SW01D	54SW02
Sample Date	12/16/00	12/16/00	12/16/00
Semivolatiles(Cont.) (ug/L)			
2,4-Dinitrophenol	50 U	50 U	50 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U
Naphthalene	10 U	10 U	10 U
4-Chloroaniline	20 U	20 U	20 U
Hexachlorobutadiene	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U
2-Methylnaphthalene	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U
2,4,5-Trichlorophenol	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U
2-Chloronaphthalene	10 U	10 U	10 U
2-Nitroaniline	50 U	50 U	50 U
Acenaphthylene	10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U
3-Nitroaniline	50 U	50 U	50 U
Acenaphthene	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U
Dibenzofuran	10 U	10 U	10 U
4-Nitrophenol	50 U	50 U	50 U
2,4-Dinitrotoluene	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U
2,3,4,6-Tetrachlorophenol	10 U	10 U	10 U
Dimethylphthalate	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U
4-Chlorophenyl-Phenylether	10 U	10 U	10 U
4-Nitroaniline	50 U	50 U	50 U
4,6-Dinitro-2-methylphenol	50 U	50 U	50 U
N-Nitrosodiphenylamine	10 U	10 U	10 U
4-Bromopheny-phenylether	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U
Pentachlorophenol	50 U	50 U	50 U
Phenanthrene	10 U	0.62 J	10 U
Anthracene	10 U	0.54 J	10 U
Di-n-butylphthalate	10 U	10 U	10 U
Fluoranthene	10 U	1.4 J	0.63 J
Pyrene	10 U	1.2 J	10 U
Butylbenzylphthalate	0.57 J	1.7 J	1.2 J
Benzo(a)anthracene	10 U	1.8 J	1.1 J

APPENDIX E.16 (continued)

SUMMARY OF ANALYTICAL RESULTS IN STANDING WATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SW01	54SW01D	54SW02
Sample Date	12/16/00	12/16/00	12/16/00
Semivolatiles(Cont.) (ug/L)			
3,3'-Dichlorobenzidine	20 U	20 U	20 U
Chrysene	0.66 J	2.8 J	1.3 J
bis(2-Ethylhexyl)phthalate	1.3 J	10 U	1.7 J
Di-n-octylphthalate	0.7 J	1.7 J	1.3 J
Benzo(b)fluoranthene	0.82 J	3.2 J	1.3 J
Benzo(k)fluoranthene	10 U	2.4 J	1.3 J
Benzo(a)pyrene	0.9 J	3.2 J	1.4 J
Indeno(1,2,3-cd)pyrene	1.1 J	2.5 J	1.3 J
Dibenzo(a,h)anthracene	1.3 J	3.4 J	1.4 J
Pyridine	50 U	50 U	50 U
Benzo(g,h,i)perylene	1.4 J	3.8 J	1.8 J
N-Nitrosodimethylamine	10 UJ	10 UJ	10 UJ
1,4-Dioxane	10 U	10 U	10 U
2-Picoline	10 U	10 U	10 U
Methyl methanesulfonate	10 U	10 U	10 U
Ethyl methanesulfonate	10 U	10 U	10 U
Acetophenone	10 U	10 U	10 U
a,a-Dimethylphenethylamine	2,000 U	2,000 U	2,000 U
2,6-Dichlorophenol	10 U	10 U	10 U
N-Nitrosopiperidine	10 UJ	10 UJ	10 UJ
N-Nitroso-di-n-butylamine	10 U	10 U	10 U
1,2,4,5-Tetrachlorobenzene	10 U	10 U	10 U
Pentachlorobenzene	10 U	10 U	10 U
1-Naphthylamine	10 U	10 U	10 U
2-Naphthylamine	10 U	10 U	10 U
Phenacetin	10 U	10 U	10 U
Pentachloronitrobenzene	10 U	10 U	10 U
Pronamide	10 U	10 U	10 U
7,12-Dimethylbenz(a)anthracen	10 U	10 U	10 U
3-Methylcholanthrene	10 U	10 U	10 U
N-Nitrosomethylethylamine	10 U	10 U	10 U
N-Nitrosodiethylamine	10 U	10 U	10 U
N-Nitrosopyrrolidine	10 U	10 U	10 U
o-Toluidine	10 U	10 U	10 U
1,4-Phenylenediamine	2,000 UJ	2,000 UJ	2,000 UJ
Hexachloropropene	10 U	10 U	10 U
Safrole	10 U	10 U	10 U
Isosafrole	10 U	10 U	10 U

APPENDIX E.16 (continued)

SUMMARY OF ANALYTICAL RESULTS IN STANDING WATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SW01	54SW01D	54SW02
Sample Date	12/16/00	12/16/00	12/16/00
Semivolatiles(Cont.) (ug/L)			
1,4-Naphthoquinone	10 U	10 U	10 U
m-Dinitrobenzene	10 U	10 U	10 U
5-Nitro-o-toluidine	10 U	10 U	10 U
1,3,5-Trinitrobenzene	10 R	10 R	10 R
4-Aminobiphenyl	10 U	10 U	10 U
Dinoseb	10 UJ	10 UJ	10 UJ
4-Nitroquinoline-1-oxide	20 R	20 R	20 R
Methapyrilene	2,000 U	2,000 U	2,000 U
p-Dimethylaminoazobenzene	10 U	10 U	10 U
2-Acetylaminofluorene	10 U	10 U	10 U
3,3'-Dimethylbenzidine	20 U	20 U	20 U
N-Nitrosomorpholine	10 U	10 U	10 U
Aramite, Total	10 U	10 U	10 U
Hexachlorophene	5,000 U	5,000 U	5,000 U
Diallate, Total	10 U	10 U	10 U
Pesticides/PCBs (ug/L)			
alpha-BHC	0.05 U	0.05 U	0.05 U
gamma-BHC (Lindane)	0.05 U	0.05 U	0.05 U
beta-BHC	0.05 U	0.05 U	0.05 U
Heptachlor	0.05 UJ	0.05 UJ	0.05 UJ
delta-BHC	0.05 U	0.05 U	0.05 U
Aldrin	0.05 U	0.05 U	0.05 U
Heptachlor epoxide	0.05 U	0.05 U	0.05 U
Isodrin	0.05 U	0.05 U	0.05 U
Endosulfan I	0.05 UJ	0.05 UJ	0.05 UJ
4,4'-DDE	0.1 U	0.1 UJ	0.1 UJ
Dieldrin	0.1 UJ	0.1 UJ	0.1 UJ
Chlorobenzilate	0.5 UJ	0.5 UJ	0.5 UJ
Endrin	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDD	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan II	0.1 U	0.1 U	0.1 U
Kepone	1 UJ	1 UJ	1 UJ
4,4'-DDT	0.1 UJ	0.1 UJ	0.1 UJ
Endrin aldehyde	0.1 UJ	0.1 UJ	0.1 UJ
Endosulfan sulfate	0.1 U	0.1 U	0.1 U
Methoxychlor	0.5 UJ	0.5 UJ	0.5 UJ
Aroclor-1016	1 U	1 U	1 U
Pesticides/PCBs(Cont.) (ug/L)			
Aroclor-1221	2 U	2 U	2 U
Aroclor-1232	1 U	1 U	1 U

APPENDIX E.16 (continued)

SUMMARY OF ANALYTICAL RESULTS IN STANDING WATER - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SW01	54SW01D	54SW02
Sample Date	12/16/00	12/16/00	12/16/00
Aroclor-1242	1 U	1 U	1 U
Aroclor-1248	1 U	1 U	1 U
Aroclor-1254	1 U	1 U	1 U
Aroclor-1260	1 U	1 U	1 U
Chlordane	0.5 U	0.5 U	0.5 U
Toxaphene	5 U	5 U	5 U
OP-Pesticides (ug/L)			
Dimethoate	10 U	10 U	10 U
Disulfoton	10 U	10 U	10 U
Famphur	10 U	10 U	10 U
Methyl parathion	10 U	10 U	10 U
O,O,O-Triethylphosphorothioa	10 U	10 U	10 U
Parathion	10 U	10 U	10 U
Phorate	10 U	10 U	10 U
Sulfotepp	10 U	10 U	10 U
Thionazin	10 U	10 U	10 U
Chlorinated Herbicides (ug/L)			
2,4-D	0.5 U	0.5 U	0.5 U
2,4,5-TP	0.5 U	0.5 U	0.5 U
2,4,5-T	0.5 U	0.5 U	0.5 U
Dioxin/Furnans (ug/L)			
TCDD	0.005 U	0.005 U	0.005 U
PCDF	0.005 U	0.005 U	0.005 U
PCDD	0.005 U	0.005 U	0.005 U
HCDF	0.005 U	0.005 U	0.005 U
HCDD	0.005 U	0.005 U	0.005 U
TCDF	0.005 U	0.005 U	0.005 U
TPH (mg/L)			
Diesel Range Organics	0.1 U	0.1 U	0.2
Gasoline Range Organics	0.05 U	0.05 U	0.05 U

APPENDIX E.17
SWMU 54, Standing Water – Inorganics

APPENDIX E.17

SUMMARY OF ANALYTICAL RESULTS IN STANDING WATER - INORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54SW01	54SW01D	54SW02
Sample Date	12/16/00	12/16/00	12/16/00
Metals (mg/L)			
Antimony	0.02 U	0.02 U	0.02 U
Arsenic	0.01 U	0.01 U	0.01 U
Barium	0.02	0.019	0.019
Beryllium	0.004 U	0.004 U	0.004 U
Cadmium	0.005 U	0.005 U	0.005 U
Chromium	0.01 U	0.01 U	0.01 U
Cobalt	0.01 U	0.01 U	0.01 U
Copper	0.0037 J	0.0044 J	0.005 J
Lead	0.005 U	0.005 U	0.005 U
Mercury	0.0002 UJ	0.0002 UJ	0.0002 UJ
Nickel	0.04 U	0.04 U	0.04 U
Selenium	0.01 U	0.01 U	0.01 U
Silver	0.01 U	0.01 U	0.01 U
Thallium	0.01 U	0.01 U	0.01 U
Tin	0.05 U	0.05 U	0.05 U
Vanadium	0.0036 J	0.0032 J	0.004 J
Zinc	0.02 U	0.02 U	0.02 U
Cyanide, Total	0.01 U	0.01 U	0.01 U
Sulfide	1 UJ	1 UJ	1 UJ

APPENDIX F
Quality Assurance/Quality Control Results

Data Qualifiers:

U – Not Detected.
J – Estimated value.
UJ – Report quantitation limit is qualified as estimated.

Notes:

ug/L – micrograms per liter.
mg/L – milligrams per liter.

APPENDIX F.1
SWMU 53, Equipment Rinsate Samples – Pesticides/PCBs

APPENDIX F.1

SUMMARY OF ANALYTICAL RESULTS, EQUIPMENT RINSATE SAMPLES - PESTICIDES/PCBS
SWMU 53- BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	53ER01	53ER02
Sample Date	12/14/00	12/14/00
Pesticides/PCBs (ug/L)		
alpha-BHC	0.05 U	0.05 U
gamma-BHC (Lindane)	0.05 U	0.05 U
beta-BHC	0.05 U	0.05 U
Heptachlor	0.05 U	0.05 U
delta-BHC	0.05 U	0.05 U
Aldrin	0.05 U	0.05 U
Heptachlor epoxide	0.05 U	0.05 U
Endosulfan I	0.05 U	0.05 U
4,4'-DDE	0.1 UJ	0.1 UJ
Dieldrin	0.1 UJ	0.1 UJ
Endrin	0.1 U	0.1 U
4,4'-DDD	0.1 UJ	0.1 UJ
Endosulfan II	0.1 UJ	0.1 UJ
4,4'-DDT	0.1 U	0.1 U
Endrin aldehyde	0.1 UJ	0.1 UJ
Endosulfan sulfate	0.1 UJ	0.1 UJ
Methoxychlor	0.5 U	0.5 U
Aroclor-1016	1 U	1 U
Aroclor-1221	2 U	2 U
Aroclor-1232	1 U	1 U
Aroclor-1242	1 U	1 U
Aroclor-1248	1 U	1 U
Aroclor-1254	1 U	1 U
Aroclor-1260	1 U	1 U
Chlordane	0.5 U	0.5 U
Toxaphene	5 U	5 U

APPENDIX F.2
SWMU 53, Equipment Rinsate Samples - Inorganics

APPENDIX F.2

SUMMARY OF ANALYTICAL RESULTS, EQUIPMENT RINSATE SAMPLES - INORGANICS
SWMU 53- BUILDING 64 (MALARIA CONTROL BUILDING)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	53ER01		53ER02	
Sample Date	12/14/00		12/14/00	
Metals (mg/L)				
Antimony	0.02	U	0.02	U
Arsenic	0.01	U	0.01	U
Barium	0.01	U	0.01	U
Beryllium	0.004	U	0.004	U
Cadmium	0.005	U	0.005	U
Chromium	0.01	U	0.012	
Cobalt	0.01	U	0.01	U
Copper	0.02	U	0.02	U
Lead	0.005	U	0.005	U
Mercury	0.0004	U	0.0004	U
Nickel	0.04	U	0.0061	J
Selenium	0.01	U	0.01	U
Silver	0.01	U	0.01	U
Thallium	0.01	U	0.01	U
Tin	0.05	U	0.05	U
Vanadium	0.01	U	0.01	U
Zinc	0.02	U	0.02	U

APPENDIX F.3
SWMU 54, Equipment Rinsate Samples – Organics

APPENDIX F.3

SUMMARY OF ANALYTICAL RESULTS IN EQUIPMENT RINSATE SAMPLES - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54ER01	54ER02	54ER03
Sample Date	12/19/00	12/21/00	12/19/00
Volatiles (ug/L)			
Dichlorodifluoromethane	5 U	5 U	5 U
Chloromethane	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U
Trichlorofluoromethane	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U
Methylene chloride	5 U	5 U	5 U
trans-1,2-Dichloroethene	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U
1,1,1-Trichloroethane	5 U	5 U	5 U
Carbon tetrachloride	5 U	5 U	5 U
Benzene	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U
Dibromomethane	5 U	5 U	5 U
Toluene	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	5 U
1,2-Dibromoethane	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U
1,1,1,2-Tetrachloroethane	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U
Styrene	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U
1,2,3-Trichloropropane	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	5 U	5 U	5 U
Acrolein	100 R	100 R	100 R
Acetone	50 U	50 U	50 U
Iodomethane	5 U	5 U	5 U
Acetonitrile	200 U	200 U	200 U
Carbon disulfide	5 U	5 U	5 U
Vinyl acetate	10 U	10 U	10 U
Volatiles(Cont.) (ug/L)			
2-Butanone	25 U	25 U	25 U
4-Methyl-2-pentanone	25 U	25 U	25 U

APPENDIX F.3 (continued)

SUMMARY OF ANALYTICAL RESULTS IN EQUIPMENT RINSATE SAMPLES - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54ER01	54ER02	54ER03
Sample Date	12/19/00	12/21/00	12/19/00
cis-1,3-Dichloropropene	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U
2-Hexanone	25 U	25 U	25 U
trans-1,4-Dichloro-2-butene	10 U	10 U	10 U
Xylenes, Total	10 U	10 U	10 U
Chloroprene	5 U	5 U	5 U
Pentachloroethane	25 U	25 U	25 U
Acrylonitrile	100 U	100 U	100 U
3-Chloro-1-Propene	5 U	5 U	5 U
Propionitrile	100 U	100 U	100 U
Methacrylonitrile	100 U	100 U	100 U
Isobutanol	200 R	200 R	200 R
Methyl methacrylate	5 U	5 U	5 U
Ethyl methacrylate	5 U	5 U	5 U
Semivolatiles (ug/L)			
Aniline	20 U	20 UJ	20 U
Phenol	10 U	10 UJ	10 U
bis(2-Chloroethyl)ether	10 U	10 UJ	10 U
2-Chlorophenol	10 U	10 UJ	10 U
1,3-Dichlorobenzene	10 U	10 UJ	10 U
1,4-Dichlorobenzene	10 U	10 UJ	10 U
Benzyl alcohol	10 U	10 UJ	10 U
1,2-Dichlorobenzene	10 U	10 UJ	10 U
2-Methylphenol	10 U	10 UJ	10 U
Bis(2-Chloroisopropyl) ether	10 U	10 UJ	10 U
N-Nitrosodi-n-propylamine	10 U	10 UJ	10 U
3&4-Methylphenol	10 U	10 UJ	10 U
Hexachloroethane	10 U	10 UJ	10 U
Nitrobenzene	10 U	10 UJ	10 U
Isophorone	10 U	10 UJ	10 U
2-Nitrophenol	10 U	10 UJ	10 U
2,4-Dimethylphenol	10 U	10 UJ	10 U
bis(2-Chloroethoxy)methane	10 U	10 UJ	10 U
2,4-Dinitrophenol	50 U	50 UJ	50 U
1,2,4-Trichlorobenzene	10 U	10 UJ	10 U

APPENDIX F.3 (continued)

SUMMARY OF ANALYTICAL RESULTS IN EQUIPMENT RINSATE SAMPLES - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54ER01	54ER02	54ER03
Sample Date	12/19/00	12/21/00	12/19/00
Semivolatiles(Cont.) (ug/L)			
Naphthalene	10 U	10 UJ	10 U
4-Chloroaniline	20 U	20 UJ	20 U
Hexachlorobutadiene	10 U	10 UJ	10 U
4-Chloro-3-methylphenol	10 U	10 UJ	10 U
2-Methylnaphthalene	10 U	10 UJ	10 U
Hexachlorocyclopentadiene	10 U	10 UJ	10 U
2,4,5-Trichlorophenol	10 U	10 UJ	10 U
2,4,6-Trichlorophenol	10 U	10 UJ	10 U
2-Chloronaphthalene	10 U	10 UJ	10 U
2-Nitroaniline	50 U	50 UJ	50 U
Acenaphthylene	10 U	10 UJ	10 U
2,6-Dinitrotoluene	10 U	10 UJ	10 U
3-Nitroaniline	50 U	50 UJ	50 U
Acenaphthene	10 U	10 UJ	10 U
2,4-Dichlorophenol	10 U	10 UJ	10 U
Dibenzofuran	10 U	10 UJ	10 U
4-Nitrophenol	50 U	50 UJ	50 U
2,4-Dinitrotoluene	10 U	10 UJ	10 U
Fluorene	10 U	10 UJ	10 U
2,3,4,6-Tetrachlorophenol	10 U	10 UJ	10 U
Dimethylphthalate	10 U	10 UJ	10 U
Diethylphthalate	10 U	10 UJ	10 U
4-Chlorophenyl-Phenylether	10 U	10 UJ	10 U
4-Nitroaniline	50 U	50 UJ	50 U
4,6-Dinitro-2-methylphenol	50 U	50 UJ	50 U
N-Nitrosodiphenylamine	10 U	10 UJ	10 U
4-Bromophenylphenyl ether	10 U	10 UJ	10 U
Hexachlorobenzene	10 U	10 UJ	10 U
Pentachlorophenol	50 U	50 UJ	50 U
Phenanthrene	10 U	10 UJ	10 U
Anthracene	10 U	10 UJ	10 U
Di-n-butylphthalate	10 U	0.84 J	10 U
Fluoranthene	10 U	10 UJ	10 U
Pyrene	10 U	10 UJ	10 U
Butylbenzylphthalate	10 U	10 UJ	10 U
Benzo(a)anthracene	10 U	10 UJ	10 U
3,3'-Dichlorobenzidine	20 U	20 UJ	20 U
Chrysene	10 U	10 UJ	10 U
Semivolatiles(Cont.) (ug/L)			
bis(2-Ethylhexyl)phthalate	10 U	0.72 J	10 U
Di-n-octylphthalate	10 U	10 UJ	10 U

APPENDIX F.3 (continued)

SUMMARY OF ANALYTICAL RESULTS IN EQUIPMENT RINSATE SAMPLES - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54ER01	54ER02	54ER03
Sample Date	12/19/00	12/21/00	12/19/00
Benzo(b)fluoranthene	10 U	10 UJ	10 U
Benzo(k)fluoranthene	10 U	10 UJ	10 U
Benzo(a)pyrene	10 U	10 UJ	10 U
Indeno(1,2,3-cd)pyrene	10 U	10 UJ	10 U
Dibenzo(a,h)anthracene	10 U	10 UJ	10 U
Pyridine	50 U	50 UJ	50 U
Benzo(g,h,i)perylene	1.6 J	10 UJ	10 U
N-Nitrosodimethylamine	10 U	10 UJ	10 U
1,4-Dioxane	10 U	10 UJ	10 U
2-Picoline	10 U	10 UJ	10 U
Methyl methanesulfonate	10 U	10 UJ	10 U
Ethyl methanesulfonate	10 U	10 UJ	10 U
Acetophenone	10 U	10 UJ	10 U
a,a-Dimethylphenethylamine	2,000 U	2,000 UJ	2,000 U
2,6-Dichlorophenol	10 U	10 UJ	10 U
N-Nitrosopiperidine	10 U	10 UJ	10 U
N-Nitrosodi-n-butylamine	10 U	10 UJ	10 U
1,2,4,5-Tetrachlorobenzene	10 U	10 UJ	10 U
Pentachlorobenzene	10 U	10 UJ	10 U
1-Naphthylamine	10 U	10 UJ	10 U
2-Naphthylamine	10 U	10 UJ	10 U
Phenacetin	10 U	10 UJ	10 U
Pentachloronitrobenzene	10 U	10 UJ	10 U
Pronamide	10 U	10 UJ	10 U
7,12-Dimethylbenz(a)anthracene	10 U	10 UJ	10 U
3-Methylcholanthrene	10 U	10 UJ	10 U
N-Nitrosomethylethylamine	10 U	10 UJ	10 U
N-Nitrosodiethylamine	10 U	10 UJ	10 U
N-Nitrosopyrrolidine	10 U	10 UJ	10 U
o-Toluidine	10 U	10 UJ	10 U
1,4-Phenylenediamine	2,000 U	2,000 R	2,000 U
Hexachloropropene	10 U	10 UJ	10 U
Safrole	10 U	10 UJ	10 U
Isosafrole	10 U	10 UJ	10 U
1,4-Naphthoquinone	10 U	10 UJ	10 U
m-Dinitrobenzene	10 U	10 UJ	10 U
Semivolatiles(Cont.) (ug/L)			
5-Nitro-o-toluidine	10 U	10 UJ	10 U
1,3,5-Trinitrobenzene	10 U	10 UJ	10 U
4-Aminobiphenyl	10 U	10 UJ	10 U
Dinoseb	10 U	10 UJ	10 U
4-Nitroquinoline-1-oxide	20 R	20 UJ	20 R

APPENDIX F.3 (continued)

SUMMARY OF ANALYTICAL RESULTS IN EQUIPMENT RINSATE SAMPLES - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54ER01	54ER02	54ER03
Sample Date	12/19/00	12/21/00	12/19/00
Methapyrilene	2,000 U	2,000 UJ	2,000 U
p-Dimethylaminoazobenzene	10 U	10 UJ	10 U
2-Acetylaminofluorene	10 U	10 UJ	10 U
3,3'-Dimethylbenzidine	20 U	20 UJ	20 U
N-Nitrosomorpholine	10 U	10 UJ	10 U
Aramite, Total	10 U	10 UJ	10 U
Hexachlorophene	5,000 U	5,000 UJ	5,000 U
Diallate, Total	10 U	10 UJ	10 U
Pesticides/PCBs (ug/L)			
alpha-BHC	0.05 U	0.05 U	0.05 UJ
gamma-BHC (Lindane)	0.05 U	0.05 U	0.05 UJ
beta-BHC	0.05 U	0.05 U	0.05 UJ
Heptachlor	0.05 UJ	0.05 UJ	0.05 UJ
delta-BHC	0.05 U	0.05 U	0.05 UJ
Aldrin	0.05 U	0.05 U	0.05 UJ
Heptachlor epoxide	0.05 U	0.05 U	0.05 UJ
Isodrin	0.05 U	0.05 U	0.05 UJ
Endosulfan I	0.05 U	0.05 U	0.05 UJ
4,4'-DDE	0.1 U	0.1 U	0.1 UJ
Dieldrin	0.1 U	0.1 U	0.1 UJ
Chlorobenzilate	0.5 UJ	0.5 UJ	0.5 UJ
Endrin	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDD	0.1 U	0.1 U	0.1 UJ
Endosulfan II	0.1 UJ	0.1 UJ	0.1 UJ
Kepone	1 UJ	1 UJ	1 UJ
4,4'-DDT	0.1 UJ	0.1 UJ	0.1 UJ
Endrin aldehyde	0.1 U	0.1 U	0.1 UJ
Endosulfan sulfate	0.1 U	0.1 U	0.1 UJ
Methoxychlor	0.5 UJ	0.5 UJ	0.5 UJ
Aroclor-1016	1 U	1 U	1 UJ
Aroclor-1221	2 U	2 U	2 UJ
Aroclor-1232	1 U	1 U	1 UJ

APPENDIX F.3 (continued)

SUMMARY OF ANALYTICAL RESULTS IN EQUIPMENT RINSATE SAMPLES - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54ER01	54ER02	54ER03
Sample Date	12/19/00	12/21/00	12/19/00
Pesticides/PCBs(Cont.) (ug/L)			
Aroclor-1242	1 U	1 U	1 UJ
Aroclor-1248	1 U	1 U	1 UJ
Aroclor-1254	1 U	1 U	1 UJ
Aroclor-1260	1 U	1 U	1 UJ
Chlordane	0.5 U	0.5 U	0.5 UJ
Toxaphene	5 U	5 U	5 UJ
OP-Pest (ug/L)			
Dimethoate	10 U	10 UJ	10 U
Disulfoton	10 U	10 UJ	10 U
Famphur	10 U	10 UJ	10 U
Methyl parathion	10 U	10 UJ	10 U
O,O,O-Triethylphosphorothioate	10 U	10 UJ	10 U
Parathion	10 U	10 UJ	10 U
Phorate	10 U	10 UJ	10 U
Sulfotepp	10 U	10 UJ	10 U
Thionazin	10 U	10 UJ	10 U
Chlorinated Herbicides (ug/L)			
2,4-D	0.5 U	0.5 U	0.5 U
2,4,5-TP	0.5 U	0.5 U	0.5 U
2,4,5-T	0.5 U	0.5 U	0.5 U
Dioxin/Furans (ug/L)			
TCDF	0.005 U	0.005 U	0.005 U
PCDF	0.005 U	0.005 U	0.005 U
HCDD	0.005 U	0.005 U	0.005 U
PCDD	0.005 U	0.005 U	0.005 U
HCDF	0.005 U	0.005 U	0.005 U
TCDD	0.005 U	0.005 U	0.005 U
TPH (mg/L)			
Diesel Range Organics	0.1 U	0.1 U	0.1 U
Gasoline Range Organics	0.05 U	0.05 U	0.05 U

APPENDIX F.4
SWMU 54, Equipment Rinsate Samples – Inorganics

APPENDIX F.4

SUMMARY OF ANALYTICAL RESULTS IN EQUIPMENT RINSATE SAMPLES - INORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54ER01	54ER02	54ER03
Sample Date	12/19/00	12/21/00	12/19/00
Metals (mg/L)			
Antimony	0.02 U	0.02 U	0.02 U
Arsenic	0.01 U	0.0053 J	0.01 U
Barium	0.01 U	0.01 U	0.01 U
Beryllium	0.004 U	0.004 U	0.004 U
Cadmium	0.005 U	0.005 U	0.005 U
Chromium	0.01 U	0.01 U	0.01 U
Cobalt	0.01 U	0.01 U	0.01 U
Copper	0.02 U	0.02 U	0.02 U
Lead	0.005 U	0.005 U	0.005 U
Mercury	0.0004 U	0.0004 U	0.0004 U
Nickel	0.04 U	0.04 U	0.04 U
Selenium	0.01 U	0.01 U	0.01 U
Silver	0.01 U	0.01 U	0.01 U
Thallium	0.01 U	0.01 U	0.01 U
Tin	0.05 U	0.05 U	0.05 U
Vanadium	0.01 U	0.01 U	0.01 U
Zinc	0.02 U	0.02 U	0.02 U
Cyanide, Tota	0.01 U	0.01 U	0.01 U
Sulfide	1 U	1 U	1 U

APPENDIX F.5
Field Blank Samples - Organics

APPENDIX F.5

SUMMARY OF ANALYTICAL RESULTS, FIELD BLANK SAMPLES - ORGANICS
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	2000FB01	2000FB02	2000FB03
Sample Date	12/20/00	12/21/00	12/20/00
Volatiles (ug/L)			
Dichlorodifluoromethane	5 U	5 U	5 U
Chloromethane	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U
Trichlorofluoromethane	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U
Methylene chloride	5 U	5 U	5 U
trans-1,2-Dichloroethene	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U
Chloroform	5 U	5 U	140
1,1,1-Trichloroethane	5 U	5 U	5 U
Carbon tetrachloride	5 U	5 U	5 U
Benzene	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	14
Dibromomethane	5 U	5 U	5 U
Toluene	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	1.4 J
1,2-Dibromoethane	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U
1,1,1,2-Tetrachloroethane	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U
Styrene	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U
1,2,3-Trichloropropane	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	5 U	5 U	5 U
Acrolein	100 R	100 R	100 R
Acetone	50 U	50 U	50 U
Iodomethane	5 U	5 U	5 U
Acetonitrile	200 U	200 U	200 U
Carbon disulfide	5 U	5 U	5 U
Vinyl acetate	10 U	10 U	10 U
Volatiles(Cont.) (ug/L)			
2-Butanone	25 U	25 U	25 U
4-Methyl-2-pentanone	25 U	25 U	25 U

APPENDIX F.5 (continued)

SUMMARY OF ANALYTICAL RESULTS, FIELD BLANK SAMPLES - ORGANICS
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	2000FB01	2000FB02	2000FB03
Sample Date	12/20/00	12/21/00	12/20/00
cis-1,3-Dichloropropene	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U
2-Hexanone	25 U	25 U	25 U
trans-1,4-Dichloro-2-butene	10 U	10 U	10 U
Xylenes, Total	10 U	10 U	10 U
Chloroprene	5 U	5 U	5 U
Pentachloroethane	25 U	25 U	25 U
Acrylonitrile	100 U	100 U	100 U
3-Chloro-1-Propene	5 U	5 U	5 U
Propionitrile	100 U	100 U	100 U
Methacrylonitrile	100 U	100 U	100 U
Isobutanol	200 R	200 R	200 R
Methyl methacrylate	5 U	5 U	5 U
Ethyl methacrylate	5 U	5 U	5 U
Semivolatiles (ug/L)			
Aniline	20 U	20 U	20 U
Phenol	10 U	10 U	10 R
bis(2-Chloroethyl)ether	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 R
1,3-Dichlorobenzene	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	12	10 U
Benzyl alcohol	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U
2-Methylphenol	10 U	10 U	10 R
Bis(2-Chloroisopropyl) ether	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	10 U	10 U	10 U
3&4-Methylphenol	10 U	10 U	10 R
Hexachloroethane	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 R
2,4-Dimethylphenol	10 U	10 U	10 R
bis(2-Chloroethoxy)methane	10 U	10 U	10 U
2,4-Dinitrophenol	50 U	50 U	50 R
1,2,4-Trichlorobenzene	10 U	10 U	10 U
Semivolatiles(Cont.)(ug/L)			
Naphthalene	10 U	10 U	10 U
4-Chloroaniline	20 U	20 U	20 U
Hexachlorobutadiene	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 R
2-Methylnaphthalene	10 U	10 U	10 U

APPENDIX F.5 (continued)

SUMMARY OF ANALYTICAL RESULTS, FIELD BLANK SAMPLES - ORGANICS
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	2000FB01	2000FB02	2000FB03
Sample Date	12/20/00	12/21/00	12/20/00
Hexachlorocyclopentadiene	10 U	10 U	10 U
2,4,5-Trichlorophenol	10 U	10 U	10 R
2,4,6-Trichlorophenol	10 U	10 U	10 R
2-Chloronaphthalene	10 U	10 U	10 U
2-Nitroaniline	50 U	50 U	50 U
Acenaphthylene	10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U
3-Nitroaniline	50 U	50 U	50 U
Acenaphthene	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 R
Dibenzofuran	10 U	10 U	10 U
4-Nitrophenol	50 U	50 U	50 R
2,4-Dinitrotoluene	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U
2,3,4,6-Tetrachlorophenol	10 U	10 U	10 R
Dimethylphthalate	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U
4-Chlorophenyl-Phenylether	10 U	10 U	10 U
4-Nitroaniline	50 U	50 U	50 U
4,6-Dinitro-2-methylphenol	50 U	50 U	50 R
N-Nitrosodiphenylamine	10 U	10 U	10 U
4-Bromopheny-phenylether	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U
Pentachlorophenol	50 U	50 U	50 R
Phenanthrene	10 U	10 U	10 U
Anthracene	10 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U	10 U
Fluoranthene	10 U	10 U	10 U
Pyrene	10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U
Benzo(a)anthracene	10 U	10 U	10 U
3,3'-Dichlorobenzidine	20 U	20 U	20 U
Chrysene	10 U	10 U	10 U
Semivolatiles(Cont.)(ug/L)			
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U
Di-n-octylphthalate	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	0.81 J
Benzo(k)fluoranthene	10 U	10 U	1.5 J
Benzo(a)pyrene	10 U	10 U	1.2 J
Indeno(1,2,3-cd)pyrene	10 U	10 U	2 J
Dibenzo(a,h)anthracene	10 U	10 U	1.4 J
Pyridine	50 U	50 U	50 U

APPENDIX F.5 (continued)

SUMMARY OF ANALYTICAL RESULTS, FIELD BLANK SAMPLES - ORGANICS
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	2000FB01	2000FB02	2000FB03
Sample Date	12/20/00	12/21/00	12/20/00
Benzo(g,h,i)perylene	10 U	10 U	1.7 J
N-Nitrosodimethylamine	10 U	10 U	10 U
1,4-Dioxane	10 U	10 U	10 U
2-Picoline	10 U	10 U	10 U
Methyl methanesulfonate	10 U	10 U	10 U
Ethyl methanesulfonate	10 U	10 U	10 U
Acetophenone	10 U	10 U	10 U
a,a-Dimethylphenethylamine	2,000 U	2,000 U	2,000 U
2,6-Dichlorophenol	10 U	10 U	10 R
N-Nitrosopiperidine	10 U	10 U	10 U
N-Nitroso-di-n-butylamine	10 U	10 U	10 U
1,2,4,5-Tetrachlorobenzene	10 U	10 U	10 U
Pentachlorobenzene	10 U	10 U	10 U
1-Naphthylamine	10 U	10 U	10 U
2-Naphthylamine	10 U	10 U	10 U
Phenacetin	10 U	10 U	10 U
Pentachloronitrobenzene	10 U	10 U	10 U
Pronamide	10 U	10 U	10 U
7,12-Dimethylbenz(a)anthracer	10 U	10 U	10 U
3-Methylcholanthrene	10 U	10 U	10 U
N-Nitrosomethylethylamine	10 U	10 U	10 U
N-Nitrosodiethylamine	10 U	10 U	10 U
N-Nitrosopyrrolidine	10 U	10 U	10 U
o-Toluidine	10 U	10 U	10 U
1,4-Phenylenediamine	2,000 U	2,000 U	2,000 U
Hexachloropropene	10 U	10 U	10 U
Safrole	10 U	10 U	10 U
Isosafrole	10 U	10 U	10 U
1,4-Naphthoquinone	10 U	10 U	10 U
m-Dinitrobenzene	10 U	10 U	10 U
Semivolatiles(Cont.)(ug/L)			
5-Nitro-o-toluidine	10 U	10 U	10 U
1,3,5-Trinitrobenzene	10 U	10 U	10 U
4-Aminobiphenyl	10 U	10 U	10 U
Dinoseb	10 U	10 U	10 U
4-Nitroquinoline-1-oxide	20 R	20 R	20 R
Methapyrilene	2,000 U	2,000 U	2,000 U
p-Dimethylaminoazobenzene	10 U	10 U	10 U
2-Acetylaminofluorene	10 U	10 U	10 U
3,3'-Dimethylbenzidine	20 U	20 U	20 U
N-Nitrosomorpholine	10 U	10 U	10 U
Aramite,Total	10 U	10 U	10 U

APPENDIX F.5 (continued)

SUMMARY OF ANALYTICAL RESULTS, FIELD BLANK SAMPLES - ORGANICS
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	2000FB01	2000FB02	2000FB03
Sample Date	12/20/00	12/21/00	12/20/00
Hexachlorophene	5,000 U	5,000 U	5,000 U
Diallate, Total	10 U	10 U	10 U
Pesticides/PCBs (ug/L)			
alpha-BHC	0.05 U	0.05 U	0.05 U
gamma-BHC (Lindane)	0.05 U	0.05 U	0.05 U
beta-BHC	0.05 U	0.05 U	0.05 U
Heptachlor	0.05 UJ	0.05 UJ	0.05 UJ
delta-BHC	0.05 U	0.05 U	0.05 U
Aldrin	0.05 U	0.05 U	0.05 U
Heptachlor epoxide	0.05 UJ	0.05 UJ	0.05 UJ
Isodrin	0.05 U	0.05 U	0.05 U
Endosulfan I	0.05 U	0.05 U	0.05 U
4,4'-DDE	0.1 U	0.1 U	0.1 U
Dieldrin	0.1 UJ	0.1 UJ	0.1 UJ
Chlorobenzilate	0.5 U	0.5 U	0.5 U
Endrin	0.1 UJ	0.1 UJ	0.1 UJ
4,4'-DDD	0.1 U	0.1 U	0.1 U
Endosulfan II	0.1 U	0.1 U	0.1 U
Kepone	1 UJ	1 UJ	1 UJ
4,4'-DDT	0.1 UJ	0.1 UJ	0.1 UJ
Endrin aldehyde	0.1 U	0.1 U	0.1 U
Endosulfan sulfate	0.1 U	0.1 U	0.1 U
Methoxychlor	0.5 UJ	0.5 UJ	0.5 UJ
Aroclor-1016	1 U	1 U	1 U
Aroclor-1221	2 U	2 U	2 U
Aroclor-1232	1 U	1 U	1 U
Pesticides/PCBs(Cont.)(ug/L)			
Aroclor-1242	1 U	1 U	1 U
Aroclor-1248	1 U	1 U	1 U
Aroclor-1254	1 U	1 U	1 U
Aroclor-1260	1 U	1 U	1 U
Chlordane	0.5 U	0.5 U	0.5 U
Toxaphene	5 U	5 U	5 U
OP-Pesticides (ug/L)			
Dimethoate	10 U	10 U	10 U
Disulfoton	10 U	10 U	10 U
Famphur	10 U	10 U	10 U
Methyl parathion	10 U	10 U	10 U
O,O,O-Triethylphosphorothioa	10 U	10 U	10 U
Parathion	10 U	10 U	10 U

APPENDIX F.5 (continued)

SUMMARY OF ANALYTICAL RESULTS, FIELD BLANK SAMPLES - ORGANICS
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	2000FB01	2000FB02	2000FB03
Sample Date	12/20/00	12/21/00	12/20/00
Phorate	10 U	10 U	10 U
Sulfotepp	10 U	10 U	10 U
Thionazin	10 U	10 U	10 U
Chlorinated Herbicides (ug/L)			
2,4-D	0.5 U	0.5 U	0.5 U
2,4,5-TP	0.5 U	0.5 U	0.5 U
2,4,5-T	0.5 U	0.5 U	0.5 U
Dioxin/Furans (ug/L)			
TCDD	0.005 U	0.005 U	0.005 U
PCDF	0.005 U	0.005 U	0.005 U
PCDD	0.005 U	0.005 U	0.005 U
HCDF	0.005 U	0.005 U	0.005 U
HCDD	0.005 U	0.005 U	0.005 U
TCDF	0.005 U	0.005 U	0.005 U
TPH (mg/L)			
Diesel Range Organics	0.1 U	0.096 J	0.1 U
Gasoline Range Organics	0.05 U	0.05 U	0.05 U

APPENDIX F.6
Field Blank Samples - Inorganics

APPENDIX F.6

SUMMARY OF ANALYTICAL RESULTS, FIELD BLANK SAMPLES - INORGANICS
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	2000FB01		2000FB02		2000FB03	
Sample Date	12/20/00		12/21/00		12/20/00	
Metals (mg/L)						
Antimony	0.02	U	0.02	U	0.02	U
Arsenic	0.01	U	0.01	U	0.01	U
Barium	0.01	U	0.01	U	0.0046	J
Beryllium	0.004	U	0.004	U	0.004	U
Cadmium	0.005	U	0.005	U	0.005	U
Chromium	0.01	U	0.014		0.01	U
Cobalt	0.01	U	0.01	U	0.01	U
Copper	0.02	U	0.02	U	0.03	
Lead	0.0021	J	0.005	U	0.011	
Mercury	0.0002	UJ	0.0002	UJ	0.0002	UJ
Nickel	0.04	U	0.04	U	0.04	U
Selenium	0.01	U	0.01	U	0.0052	J
Silver	0.01	U	0.01	U	0.01	U
Thallium	0.01	U	0.01	U	0.01	U
Tin	0.05	U	0.05	U	0.05	U
Vanadium	0.01	U	0.01	U	0.01	U
Zinc	0.02	U	0.0068	J	0.026	
Cyanide, Tota	0.01	U	0.01	U	0.01	U
Sulfide	1	UJ	1	UJ	1	UJ

APPENDIX F.7
SWMU 54, Trip Blank Samples - Organics

APPENDIX F.7

SUMMARY OF ANALYTICAL RESULTS IN TRIP BLANK SAMPLES - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54TB01	TB04	TB06	TB07	TB09A	TB10
Sample Date	12/15/00	12/18/00	12/19/00	12/19/00	12/20/00	12/21/00
Volatiles (ug/L)						
Dichlorodifluoromethane	5 U	5 U	5 U	5 U	5 U	5 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
Methylene chloride	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U	5 U	5 U	5 U
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U	5 U
Dibromomethane	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromoethane	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U
1,1,1,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U
1,2,3-Trichloropropane	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropa	5 U	5 U	5 U	5 U	5 U	5 U
Acrolein	100 R	100 R	100 R	100 R	100 R	100 R
Acetone	50 U	50 U	50 U	50 U	50 U	50 U
Iodomethane	5 U	5 U	5 U	5 U	5 U	5 U
Acetonitrile	200 U	200 U	200 U	200 U	200 U	200 U
Carbon disulfide	5 U	5 U	5 U	5 U	5 U	5 U

APPENDIX F.7 (continued)

SUMMARY OF ANALYTICAL RESULTS IN TRIP BLANK SAMPLES - ORGANICS
SWMU 54 - BUILDING 1914 (FORMER NEX REPAIR/MAINTENANCE SHOP)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	54TB01	TB04	TB06	TB07	TB09A	TB10
Sample Date	12/15/00	12/18/00	12/19/00	12/19/00	12/20/00	12/21/00
Volatiles(Cont.) (ug/L)						
Vinyl acetate	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	25 U	25 U	25 U	25 U	25 U	25 U
4-Methyl-2-pentanone	25 U	25 U	25 U	25 U	25 U	25 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	25 U	25 U	25 U	25 U	25 U	25 U
trans-1,4-Dichloro-2-butene	10 U	10 U	10 U	10 U	10 U	10 U
Xylenes, Total	10 U	10 U	10 U	10 U	10 U	10 U
Chloroprene	5 U	5 U	5 U	5 U	5 U	5 U
Pentachloroethane	25 U	25 U	25 U	25 U	25 U	25 U
Acrylonitrile	100 U	100 U	100 U	100 U	100 U	100 U
3-Chloro-1-Propene	5 U	5 U	5 U	5 U	5 U	5 U
Propionitrile	100 U	100 U	100 U	100 U	100 U	100 U
Methacrylonitrile	100 U	100 U	100 U	100 U	100 U	100 U
Isobutanol	200 R	200 R	200 UR	200 R	200 R	200 R
Methyl methacrylate	5 U	5 U	5 U	5 U	5 U	5 U
Ethyl methacrylate	5 U	5 U	5 U	5 U	5 U	5 U
TPH (mg/L)						
Gasoline Range Organics	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	NA

APPENDIX G
Information from BB&L Site 510 Characterization Report

TABLE 3-3

MONITORING WELL COMPLETION SUMMARY

SITE 510
ROOSEVELT ROADS, U.S. NAVAL STATION
CEIBA, PUERTO RICO

Well Designation	510-MW1	510-MW2	510-MW3	510-MW4	510-MW5	510-DW1	510-DW2
Date Installed	2/21/95	2/21/95	2/21/95	2/22/95	3/21/95	3/22-23/95	4/13 & 17/95
Total Well Depth (ft)	13	20	15	15	20	25	45
Top of Casing Elevation (ft, msl)	22.59	22.94	22.92	21.56	25.30	22.80	22.76
Type of Completion (Stick Up or Flush)	Flush	Stick Up	Stick Up	Flush	Flush	Flush	Flush
Casing Type	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC
Surface Casing (ft)	NA	NA	NA	NA	NA	15	35
Well Casing Length (ft)	3	5	5	5	10	20	40
Screen Type	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC	Schedule 40 PVC
Screen Slot Size (in)	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Screen Length (fl)	10	15	10	10	10	5	5
Screen Interval (ft BLS)	3-13	5-20	5-15	5-15	10-20	20-25	40-45

Note: All monitoring wells are 2 inches in diameter.
NA = not applicable
in = inch
ft = feet
msl = mean sea level
BLS = below land surface

Source: Blasland, Bouck & Lee, Inc., 1995

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TABLE 3–4

WATER LEVEL DATA

SITE 510
ROOSEVELT ROADS, U.S. NAVAL STATION
CEIBA, PUERTO RICO

Well Designation	Elevation of Top Of Casing (ft, msl)/a	April 3–4, 1995			May 24, 1995		
		Depth to Water (ft)	Depth to Product (ft)	Water Level Elevation (ft, msl)	Depth to Water (ft)	Depth to Product (ft)	Water Level Elevation (ft, msl)
510–MW1	22.59	6.98	ND	15.61	11.46	ND	11.13
510–MW2	22.94	17.00	ND	10.94	18.13	ND	9.81
510–MW3	22.92	12.10	ND	10.82	13.14	ND	9.78
510–MW4	21.56	10.62	ND	10.94	11.03	ND	10.53
510–MW5	25.30	14.42	ND	10.88	15.58	ND	9.72
510–DW1	22.80	11.90	ND	10.90	13.02	ND	9.78
510–DW2	22.76	NI	NA	NA	13.00	ND	9.76

Note: Top–of–casing elevations referenced to msl
Datum used is mean low water as established by U.S. Navy survey section as of Nov. 1941.

msl = mean sea level
NI = Not Installed
NI = Not Installed
NA = Not Available
a/ = Elevations referenced to Daguao Station elevation 17.51 MSL Datum
ND = None Detected

Source: Blasland, Bouck & Lee, Inc., 1995

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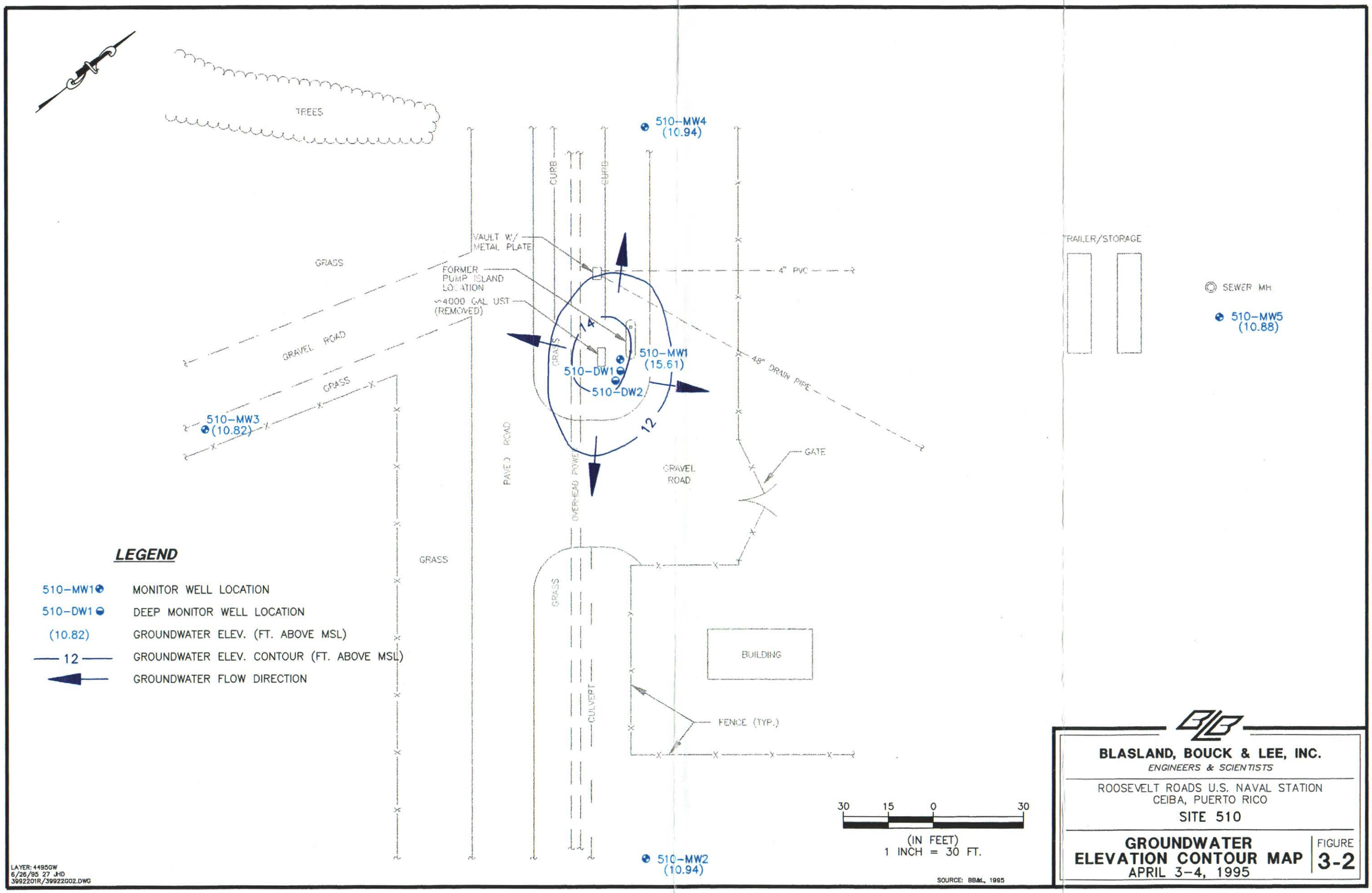
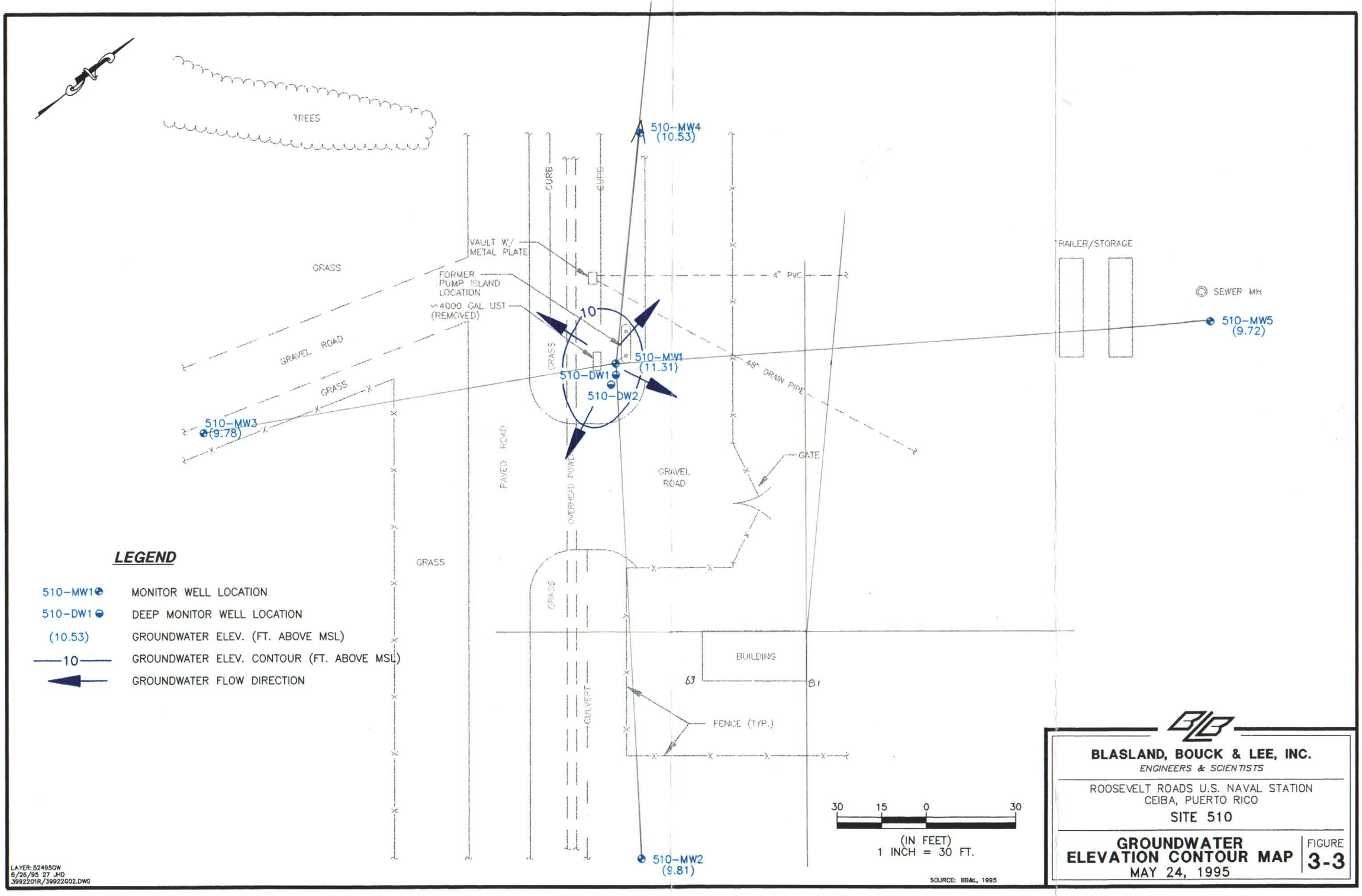

TREES
510--MW4
(10.94)
CURB
CURB
VAULT W/
METAL PLATE
FORMER
PUMP ISLAND
LOCATION
~4000 GAL UST
(REMOVED)
GRASS
GRAVEL ROAD
GRASS
510-MW3
(10.82)
4" PVC
48" DRAIN PIPE
14
12
510-MW1
(15.61)
510-DW1
510-DW2
GRASS
PAVED ROAD
OVERHEAD POWER
GRAVEL
ROAD
GATE
GRASS
GRASS
CULVERT
BUILDING
FENCE (TYP.)
510-MW2
(10.94)
TRAILER/STORAGE
SEWER MH
510-MW5
(10.88)
30 15 0 30
(IN FEET)
1 INCH = 30 FT.
SOURCE: BB&L, 1995
LEGEND
510-MW1 MONITOR WELL LOCATION
510-DW1 DEEP MONITOR WELL LOCATION
(10.82) GROUNDWATER ELEV. (FT. ABOVE MSL)
12 GROUNDWATER ELEV. CONTOUR (FT. ABOVE MSL)
GROUNDWATER FLOW DIRECTION
LAYER: 4495GW
6/26/95 27 JHD
3992201R/39922G02.DWG
BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS
ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO
SITE 510
GROUNDWATER
ELEVATION CONTOUR MAP
APRIL 3-4, 1995
FIGURE
3-2



BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO

SITE 510

GROUNDWATER ELEVATION CONTOUR MAP
MAY 24, 1995

FIGURE **3-3**

TABLE 4-3

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

SITE 510
ROOSEVELT ROADS, U.S. NAVAL STATION
CEIBA, PUERTO RICO

Parameter (Units)	Puerto Rico EQB Target Levels	U.S. EPA MCL	510-MW1	510-MW2	510-MW3	510-MW4	510-MW5	510-DW1	510-DW2
Date Sampled			4/3/95	4/3/95	4/3/95	4/3/95	4/3/95	4/4/95	4/20/95
Benzene (μg/L)	5	1.0	69	<1.0	<1.0	<1.0	<1.0	4,800	2.4
Toluene (μg/L)	NS	1,000	<5.0	<1.0	<1.0	<1.0	<1.0	150	<1.0
Ethylbenzene (μg/L)	NS	700	130	<1.0	<1.0	<1.0	<1.0	340	<1.0
Xylenes (μg/L)	NS	10,000	85	<1.0	<1.0	<1.0	<1.0	2,300	9.4
Total BTEX (μg/L)	50	NS	284	<4.0	<4.0	<4.0	<4.0	7,590	11.8
MTBE (μg/L)	NS	NS	<50	<10	<10	<10	<10	<250	<10
PAH (μg/L)	NS	NS	<110	NA	<110	NA	<110	NA	NA
Total Naphthalenes (μg/L)	NS	NS	80	NA	<30	NA	<30	NA	NA
Lead (mg/L)	NS	0.015	0.12	NA	NA	NA	<0.005	NA	NA
TPH (mg/L)	50	NS	<1.0	<1.0	<1.0	<1.0	<1.0	6.1	<1.0

Notes:

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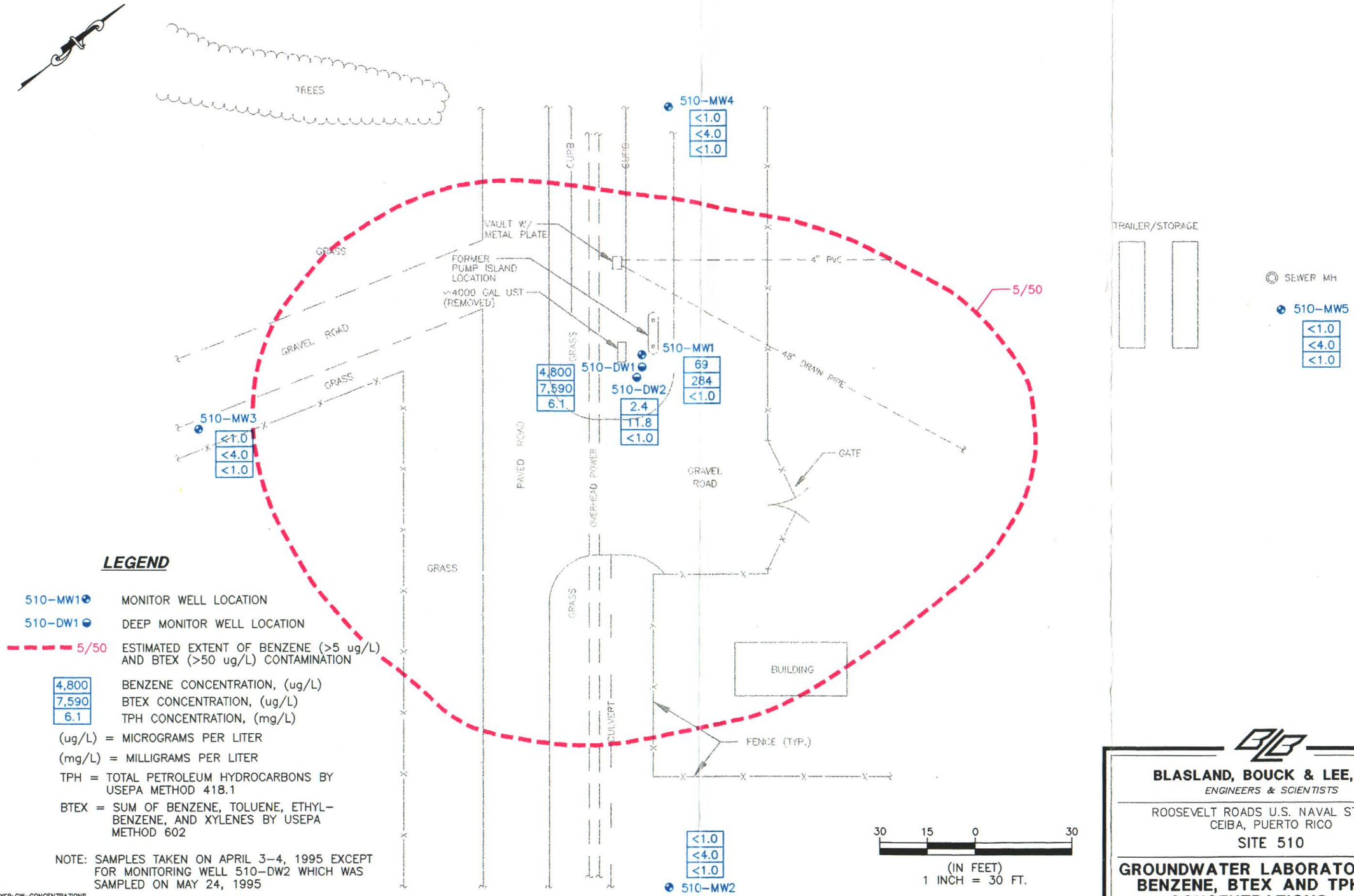
μg/L = Micrograms per liter
mg/L = Milligrams per liter
MTBE = Methyl-tert-butyl ether
Total BTEX = Sum of benzene, toluene, ethylbenzene, and xylenes
PAH = Polynuclear aromatic hydrocarbons (exclusing naphthalenes)
TPH = Total petroleum hydrocarbons by EPA Method 418.1
NA = Not analyzed
NS = No standard
MCL = Maximum Contaminant Level (drinking water supplies)
Total Naphthalenes = Sum of naphthalene and methylnaphthalenes

Source: Blasland, Bouck & Lee, Inc.; Savannah Laboratories, Inc., 1995



LEGEND

510-MW1	MONITOR WELL LOCATION
510-DW1	DEEP MONITOR WELL LOCATION
5/50	ESTIMATED EXTENT OF BENZENE (>5 ug/L) AND BTEX (>50 ug/L) CONTAMINATION
4,800	BENZENE CONCENTRATION, (ug/L)
7,590	BTEX CONCENTRATION, (ug/L)
6.1	TPH CONCENTRATION, (mg/L)

(ug/L) = MICROGRAMS PER LITER

(mg/L) = MILLIGRAMS PER LITER

TPH = TOTAL PETROLEUM HYDROCARBONS BY USEPA METHOD 418.1

BTEX = SUM OF BENZENE, TOLUENE, ETHYL-BENZENE, AND XYLENES BY USEPA METHOD 602

NOTE: SAMPLES TAKEN ON APRIL 3-4, 1995 EXCEPT FOR MONITORING WELL 510-DW2 WHICH WAS SAMPLED ON MAY 24, 1995

LAYER: GW-CONCENTRATIONS
6/26/95 27 JHD
3992201R/39922G02.DWG

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

ROOSEVELT ROADS U.S. NAVAL STATION
CEIBA, PUERTO RICO

SITE 510

GROUNDWATER LABORATORY BENZENE, BTEX AND TPH CONCENTRATIONS

FIGURE **4-3**

APPENDIX H
Data Validation Information

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	PRNS01
Date:	March 9, 2001
Client Name:	CH2M Hill
Project/Site Name:	Roosevelt Roads
Date Sampled:	December 13 - 14, 2000
Number of Samples:	15 Non-Aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	Severn Trent Laboratories, Inc.
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data Review, Region II
QA/QC Level:	NEESA D
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Appendix IX (Volatiles, Semivolatiles, Pesticides/PCBs, Herbicides, Diesel Range Organics, Gasoline Range Organics, Dioxins/Furans, Metals, Sulfide and Cyanide)

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

for Lisa Juneau
~~Paul B.~~ Humburg, President

3-9-01
Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# PRNS01

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

CH2M HILL ID	MATRIX	VOA		SVOA		P/P		HERB		DRO		GRO		D/F		MET		SUL		CN	
54SS07	SOIL		X		X		X		X		X		X		X		X		X		X
54SS06	SOIL		X		X		X		X		X		X		X		X		X		X
54SS14	SOIL		X		X		X		X		X		X		X		X		X		X
54SS15	SOIL		X		X		X		X		X		X		X		X		X		X
54SS01	SOIL		X		X		X		X		X		X		X		X		X		X
54SS02	SOIL		X		X		X		X		X		X		X		X		X		X
54SS12	SOIL		X		X		X		X		X		X		X		X		X		X
54SS03	SOIL		X		X		X		X		X		X		X		X		X		X
54SS05	SOIL		X		X		X		X		X		X		X		X		X		X
54SS13	SOIL		X		X		X		X		X		X		X		X		X		X
54SS13 MS	SOIL		X		X		X		X		X		X		X		X		X		X
54SS13 MSD	SOIL		X		X		X		X		X		X		X		X		X		X
54SS13D	SOIL		X		X		X		X		X		X		X		X		X		X
54SS04	SOIL		X		X		X		X		X		X		X		X		X		X
54SS04D	SOIL		X		X		X		X		X		X		X		X		X		X
54SS08	SOIL		X		X		X		X		X		X		X		X		X		X
54SS09	SOIL		X		X		X		X		X		X		X		X		X		X
Total Billable Samples (Water/Soil)		0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17

VOA= Appendix IX Volatiles
SVOA= Appendix IX Semivolatiles
P/P= Appendix IX Pesticides/PCBs
HERB= Appendix IX Herbicides
DRO= Appendix IX Diesel Range Organics
GRO= Appendix IX Gasoline Range Organics
D/F= Appendix IX Dioxins/Furans
MET= Appendix IX Metals
SUL= Appendix IX Sulfide
CN= Appendix IX Cyanide

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260B; the National Functional Guidelines for Organic Data Review, Region II and NEESA D. All comments made within this report should be considered when examining the analytical results.

SDG # PRNS01

A validation was performed on the Volatile Data from SDG PRNS01. The data was evaluated based on the following parameters.

* Data Completeness
* Holding Times
* GC/MS Tuning
  Calibrations
  Internal Standard Performance
  Blanks
* Surrogate Recoveries
* Laboratory Control Samples
* Matrix Spike/Matrix Spike duplicate
* Field Duplicates
  Compound Identification/Quantitation

* - All criteria were met for this parameter

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

PAGE - 2

Calibrations

The continuing calibration, LQ428, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below qualify all positive results as estimated (J) and non detected results as rejected (R).

08524-2	acrolein
08524-4	
08524-6	
08524-1	
08524-3	
08524-5	
08524-7RE	

The continuing calibration, LQ432, contained compounds with %Ds greater than 50% and less than 90%. For the samples and non-compliant compounds listed below qualify all positive results as estimated (J) and non detected results as estimated (UJ).

08541-1	acrolein
08541-2	
08541-3	
08541-4	
08596-1	
08596-2	
08596-3	
08596-4	

Internal Standards

Sample 08524-7RE exhibited low internal standard area recoveries for 1,4-dichlorobenzene-d4. Qualify all associated compound results as estimated (J/UJ).

Sample 08596-2 exhibited low internal standard area recoveries for 1,2-dichloroethane-d4. Qualify all associated compound results as estimated (J/UJ).

Blanks

Reject all laboratory "B" flagged TICs due to blank contamination.

Blank

The blank(s) associated with samples in this SDG exhibited contamination. Qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

Associated blank	Compound	Concentration	Action Level
1L1218MB	methylene chloride	1.6J ug/Kg	16 ug/Kg

Samples	Compound	Qualification
08524-3 08524-5 08524-7RE	methylene chloride	CRQL

Compound Identification/Quantitation

Do not use sample 08524-7, in favor of the re-analysis, due to non compliant internal standard area recoveries.

Do not use sample 08596-2RE, in favor of the initial analysis, due to non compliant internal standard area recoveries.

System Performance and Overall Assessment

The data as presented requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
08524-2	acrolein	+/-	J/R
08524-4			
08524-6			
08524-1			
08524-3			
08524-5			
08524-7RE			
08541-1	acrolein	+/-	J/UJ
08541-2			
08541-3			
08541-4			
08596-1			
08596-2			
08596-3			
08596-4			
	All Associated Compounds	+/-	J/UJ
08524-7RE	1,4-dichlorobenzene-d4		
08596-2	1,2-dichloroethane-d4		
All Samples	"B" flagged TICs	+	R
08524-3	methylene chloride	+	CRQL
08524-5			
08524-7RE			
08524-7	all results	+/-	R
08596-2RE			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C; the National Functional Guidelines for Organic Data Review, Region II and NEESA D. All comments made within this report should be considered when examining the analytical results.

SDG # PRNS01

A validation was performed on the Semivolatile Data from SDG PRNS01. The data was evaluated based on the following parameters.

* Data Completeness
* Holding Times
* GC/MS Tuning
  Calibrations
* Internal Standard Performance
  Blanks
* Surrogate Recoveries
* Laboratory Control Samples
  Matrix Spike/Matrix Spike duplicate
* Field Duplicates
* Compound Identification/Quantitation

* - All criteria were met for this parameter

Calibrations

The initial calibration, analyzed on 11/17/00, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as rejected (R).

All Samples	1,3,5-trinitrobenzene 4-nitroquinoline-1-oxide aramite-1

The continuing calibration, EQ337, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as rejected (R).

All Samples	4-nitroquinoline-1-oxide

The continuing calibration, EQ337, contained compounds with %Ds greater than 50% and less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as estimated (UJ).

All Samples	1,4-phenylenediamine dinoseb

Blank

The blank(s) associated with samples in this SDG exhibited contamination. Qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

Associated blank	Compound	Concentration	Action Level
1219A-EMB	chrysene	41J ug/Kg	205 ug/Kg
	benzo(b)fluoranthene	28J	280
	benzo(g,h,i)perylene	42J	420

Blanks (continued)

Samples	Compound	Qualification
08524-1 (54SS07) 08524-2 (54SS06)	chrysene	CRQL
08524-1 (54SS07)	benzo(b)fluoranthene	CRQL
08524-1 (54SS07) 08524-7 (54SS12)	benzo(g,h,i)perylene	CRQL

Matrix Spike/Matrix Spike duplicate

The MS and MSD associated with sample 08541-3 (54SS13) exhibited zero percent recoveries for pentachlorophenol and 4-nitrophenol. Qualify the non detect results for these compounds in sample 08541-3 (54SS13) as rejected (R).

System Performance and Overall Assessment

The data as presented requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
All Samples	1,3,5-trinitrobenzene 4-nitroquinoline-1-oxide aramite-1	+/-	J/R
All Samples	4-nitroquinoline-1-oxide	+/-	J/R
All Samples	1,4-phenylenediamine dinoseb	+/-	J/UJ
08524-1 (54SS07) 08524-2 (54SS06)	chrysene	+	CRQL
08524-1 (54SS07)	benzo(b)fluoranthene	+	CRQL
08524-1 (54SS07) 08524-7 (54SS12)	benzo(g,h,i)perylene	+	CRQL
08541-3 (54SS13)	pentachlorophenol 4-nitrophenol	-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

APPENDIX IX PESTICIDES/PCBs

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8081A and 8082; Region II Data Validation Guidelines SOP HW-23, Revision 0, April 1995, as applicable; and NEESA Level D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG# PRNS01

A validation was performed on the Appendix IX Pesticide/PCB data from SDG PRNS01. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibrations
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Method Deviations

The laboratory did not include calibration verification standards for the multi-component target compounds toxaphene and technical chlordane although the method (SW-846, Method 8081A, Revision 1, December 1996, page 8081A - 12, section 7.4.1.2) requires that "for calibration verification (each 12 hour shift) all target analytes required in the project plan must be injected". The laboratory analyzed five-point initial calibrations for these compounds. There were no positive results reported in these samples for the multi-component pesticides toxaphene or technical chlordane. Therefore, no qualifications were required based on this method deviation.

Calibrations

The initial calibration analyzed on 12/14/00 exhibited one (1) compound with a R^2 less than 0.990. For the following samples and non-compliant compound, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

All Samples	Chlorobenzilate

The continuing calibration analyzed on 12/21/00 at 19:31 exhibited eight (8) compounds with %Ds greater than 15%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

All Samples	Gamma-BHC
	Heptachlor
	Aldrin
	4,4'-DDE
	Dieldrin
	Endrin
	Endrin Aldehyde
	Methoxychlor

The continuing calibration analyzed on 12/21/00 at 20:19 exhibited two (2) compounds with %Ds greater than 15%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

All Samples	Isodrin
	Kepone

Field Duplicates

The field duplicate pair of samples 54SS13 and 54SS13D exhibited high RPDs for three (3) compounds and required qualifications. For the following samples and compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

54SS13	4,4'-DDE
54SS13D	4,4'-DDD
	4,4'-DDT

The field duplicate pair of samples 54SS04 and 54SS04D exhibited a high RPD for one (1) compound and required qualifications. For the following samples and compound, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

54SS04	4,4'-DDE
54SS04D	

Compound Quantitation

All positive results exhibiting column quantitation %Ds greater than 50% and the reported result is less than the CRQL, are raised to the CRQL and qualified as non-detect, U.

All positive results exhibiting column quantitation %Ds greater than 25% but ≤ 70% are qualified as estimated, J.

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
All Samples	Chlorobenzilate	+/-	J/UJ
All Samples	Gamma-BHC Heptachlor Aldrin 4,4'-DDE Dieldrin Endrin Endrin Aldehyde Methoxychlor	+/-	J/UJ
All Samples	Isodrin Kepone	+/-	J/UJ
54SS13 54SS13D	4,4'-DDE 4,4'-DDD 4,4'-DDT	+/-	J/UJ
54SS04 54SS04D	4,4'-DDE	+/-	J/UJ
All Samples	All P > 50% And < CRQL	+	CRQL
All Samples	All P > 25% But ≤ 70%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
HERBICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8151; Region II Data Validation Guidelines SOP No. HW-17, Revision 1.3, November 1994, as applicable; and NEESA D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PRNS01

A validation was performed on the Herbicide Data from SDG PRNS01. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The continuing calibration analyzed on 12/27/00 at 22:41 exhibited one (1) compound with a %D greater than 15% for which qualifications were required. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J.

54SS04	2,4,5-TP

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
54SS04	2,4,5-TP	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
DIESEL RANGE ORGANICS ANALYSIS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8015; Region II modifications to the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PRNS01

A validation was performed on the Diesel Range Organics Data from SDG PRNS01. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
	•	Matrix Spike/Matrix Spike Duplicates
	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Matrix Spike/Matrix Spike Duplicates

The MS/MSD pair of sample 54SS13 exhibited MS and MSD recoveries less than 10% for Diesel. For the following sample and non-compliant compound, the positive results are qualified as estimated, J, and the non-detect results are rejected, R.

54SS13	Diesel

Field Duplicates

The field duplicate pair of samples 54SS04 and 54SS04D exhibited a high RPD for one (1) compound and required qualifications. For the following samples and compound, the positive results are qualified as estimated, J.

54SS04	Diesel
54SS04D	

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
54SS13	Diesel	+/-	J/R
54SS04 54SS04D	Diesel	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
GASOLINE RANGE ORGANICS ANALYSIS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8015M; Region II modifications to the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PRNS01

A validation was performed on the Gasoline Range Organics Data from SDG PRNS01. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	Calibration
*	•	Blanks
	•	Internal Standards
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Internal Standards

Three (3) samples exhibited low internal standard areas. For the following samples, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

54SS14
54SS06
54SS12

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
54SS14	Gasoline	+/-	J/UJ
54SS06			
54SS12			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
DIOXIN/FURANS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard recoveries. This report was prepared in compliance relative to the analytical quality control and deliverable requirements specified in the SW-846 Method 8280 for Dioxin /Furans; the Region II Validation Guidelines, as applicable, and NEESA Level D requirements. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # PRNS01

A validation was performed on the Dioxin/Furans Data from SDG PRNS01. The data was evaluated based on the following parameters.

- * Data Completeness
- * Holding Times
- * Mass Resolution Checks
- * Column Performance
- * Calibrations
- * Internal Standard Recoveries and Performance
- * Method and Field Blanks
- * Matrix Spike/Matrix Spike Duplicate (MS/MSD)
- * Laboratory Control Sample (LCS)
- * Field Duplicate
- * Congener Identification
- * Congener Quantitation

* - All criteria were met for this parameter

Overall Assessment

The overall quality of the data package was acceptable. All data is reported as is without qualification.

GLOSSARY OF DATA VALIDATION QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on the dilution analysis

EMPC = Result value is presumptively present and the reported value is the maximum possible concentration

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	CONGENER ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS, CYANIDE AND SULFIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation for Region II, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each categ~~ory~~ to the Summary of Data Qualification table.

SDGs # PRNS01

A validation was performed on the Metals, Cyanide and Sulfide Data from SDG PRNS01. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
	●	Calibrations
*	●	Blanks
*	●	Interferences
	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
	●	Serial Dilutions

* - All criteria were met for this parameter.

Calibration Verification Standard results

1. The second Calibration Verification Standards (CRI) for Thallium were greater than 120%. No qualification is necessary.

Matrix Spike Recovery results

2. The matrix spike recoveries for soils for Antimony (48%) and Sulfide (47%) were below the lower control limits (>10% but <75%). All positive and non-detect results are qualified as estimated, "J" and "UJ".

3. The matrix spike recovery for soils for Copper (135%) was above the upper control limits (135%). All positive results are qualified as estimated, "J".

4. The matrix spike recoveries for soils for Chromium (223%) and Mercury (256%) were greater than 200%. All positive results are rejected.

Serial Dilution results

5. The serial dilution results for soils for Zinc was greater than 10%. All positive results are qualified as estimated, "J".

6. All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
2. all soil samples	Sb and S.	+/U	J/UJ
3. all soil samples	Cu.	+	J
4. all soil samples	Cr and Hg.	+	R
5. all soil samples	Zn.	+	J
6. all "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	PRNS03
Date:	February 16, 2001
Client Name:	CH2M Hill
Project/Site Name:	Roosevelt Roads CTO-99
Date Sampled:	December 13 - 14, 2000
Number of Samples:	11 Non-Aqueous Sample(s) with 1 MS/MSD(s) 2 Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Severn Trent Laboratories, Inc.
Validation Guidance:	National Functional Guidelines for Organic Data, October, 1999 and Inorganic Data, February, 1994, Region II Modifications
QA/QC Level:	NEESA D
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Pesticides/PCBs and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Simpson
Paul B. Humburg, President

2-16-01.
Date

4127 Plaza 94 South • St. Charles, MO 63304
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SDG# PRNS03

Samples and Fractions Reviewed

Sample Identifications Analytical Fractions

CH2M HILL ID	MATRIX	P/P		MET	
53SB05-00	SOIL		X		X
53SB05-02	SOIL		X		X
53SB06-00	SOIL		X		X
53SB06-03	SOIL		X		X
53SS01	SOIL		X		X
53SS02	SOIL		X		X
53SS03	SOIL		X		X
53SS04	SOIL		X		X
53SS05	SOIL		X		X
53SS06	SOIL		X		X
53SS06 MS	SOIL		X		X
53SS06 MSD	SOIL		X		X
53SS06D	SOIL		X		X
53ER01	WATER	X		X	
53ER02	WATER	X		X	
Total Billable Samples (Water/Soil)		2	13	2	13

P/P= Pesticides/PCBs
MET= Metals

DATA ASSESSMENT NARRATIVE

PESTICIDES/PCBs

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8081A and 8082; Region II Data Validation Guidelines SOP HW-23, Revision 0, April 1995, as applicable; and NEESA Level D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG# PRNS03

A validation was performed on the Pesticide/PCB data from SDG PRNS03. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibrations
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The continuing calibration analyzed on 12/21/00 at 16:07 exhibited seven (7) compounds with %Ds greater than 15%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

53ER01	4,4'-DDE
53ER02	Dieldrin
	4,4'-DDD
	Endosulfan II
	Endrin Aldehyde
	Endosulfan Sulfate

The continuing calibration analyzed on 12/21/00 at 22:32 exhibited four (4) compounds with %Ds greater than 15%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

53SB06-00	Heptachlor Epoxide
53SB06-03	Endrin
53SS04	4,4'-DDD
53SS05	Endosulfan Sulfate
53SS06	
53SS06D	

The continuing calibration analyzed on 12/28/00 at 09:35 exhibited eight (8) compounds with %Ds greater than 15%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

53SS01	Dieldrin
53SS02	4,4'-DDT
53SS03	Heptachlor Epoxide
53SB05-00	Endrin
53SB05-02	4,4'-DDD
	Endosulfan II

Calibrations, Continued

The continuing calibration analyzed on 12/28/00 at 09:59 exhibited one (1) compound with a %D greater than 15%. For the following samples and non-compliant compound, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

53SS01	Aroclor-1260
53SS02	
53SS03	
53SB05-00	
53SB05-02	

Field Duplicates

The field duplicate pair of samples 53SS06 and 53SS06D exhibited positive results and high RPDs for two (2) compounds and required qualifications. For the following samples and compounds, the positive results are qualified as estimated, J.

53SS06	4,4'-DDE
53SS06D	4,4'-DDT

Compound Quantitation

All positive results exhibiting column quantitation %Ds greater than 50% and the reported result is less than the CRQL, are raised to the CRQL and qualified as non-detect, U.

All positive results exhibiting column quantitation %Ds greater than 25% but ≤ 70% are qualified as estimated, J.

All positive results exhibiting column quantitation %Ds greater than 70% but ≤ 100% are qualified as presumptively present at an estimated concentration, NJ.

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
53ER01	4,4'-DDE	+/-	J/UJ
53ER02	Dieldrin		
	4,4'-DDD		
	Endosulfan II		
	Endrin Aldehyde		
	Endosulfan Sulfate		
53SB06-00	Heptachlor Epoxide	+/-	J/UJ
53SB06-03	Endrin		
53SS04	4,4'-DDD		
53SS05	Endosulfan Sulfate		
53SS06			
53SS06D			
53SS01	Dieldrin	+/-	J/UJ
53SS02	4,4'-DDT		
53SS03	Heptachlor Epoxide		
53SB05-00	Endrin		
53SB05-02	4,4'-DDD		
	Endosulfan II		
53SS01	Aroclor-1260	+/-	J/UJ
53SS02			
53SS03			
53SB05-00			
53SB05-02			
53SS06	4,4'-DDE	+	J
53SS06D	4,4'-DDT		
All Samples	All P > 50% And < CRQL	+	CRQL
All Samples	All P > 25% But ≤ 70%	+	J
All Samples	All P > 70% But ≤ 100%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation for Region II, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # PRNS03

A validation was performed on the Metals Data from SDG PRNS03. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
*	●	Blanks
*	●	Interferences
	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
*	●	Serial Dilutions

* - All criteria were met for this parameter.

Matrix Spike Recovery results

1. The matrix spike recoveries for soils for Antimony (32%), Barium (23%), Mercury (39%) and Chromium (54%) were below the lower control limits (>10% but <75%). All positive and non-detect results are qualified as estimated, "J" and "UJ".

2. The matrix spike recovery for soils for Copper (130%) was above the upper control limits (135%). All positive results are qualified as estimated, "J".

3. All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
1. all soil samples	Sb, Ba, Hg and Cr.	+/U	J/UJ
2. all soil samples	Cu.	+	J
3. all "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	PRNS04
Date:	March 9, 2001
Client Name:	CH2M Hill
Project/Site Name:	Roosevelt Roads
Date Sampled:	December 15 - 21, 2000
Number of Samples:	22 Aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	Severn Trent Laboratories, Inc.
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data Review, Region II
QA/QC Level:	NEESA D
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Appendix IX (Volatiles, Semivolatiles, Pesticides/PCBs, Herbicides, Diesel Range Organics, Gasoline Range Organics, Dioxins/Furans, Metals, Sulfide and Cyanide)

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

for Lisa R. Juneau
Paul B. Humburg, President

3-9-01
Date

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SDG# PRNS04

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

CH2M HILL ID	MATRIX	VOA		SVOA		P/P		HERB		DRO		GRO		D/F		MET		SUL		CN	
510-MW1	WATER	X		X		X		X		X		X		X		X-		X		X	
54TB01	WATER	X										X									
54SW01	WATER	X		X		X		X		X		X		X		X		X		X	
54SW01D	WATER	X		X		X		X		X		X		X		X		X		X	
54SW02	WATER	X		X		X		X		X		X		X		X		X		X	
TB04	WATER	X										X									
510-MW04	WATER	X		X		X		X		X		X		X		X		X		X	
TB07	WATER	X										X									
510-MW02	WATER	X		X		X		X		X		X		X		X		X		X	
510-MW02 MS	WATER	X		X		X		X		X		X		X		X		X		X	
510-MW02 MSD	WATER	X		X		X		X		X		X		X		X		X		X	
2000FB03	WATER	X		X		X		X		X		X		X		X		X		X	
54TW02	WATER	X		X		X		X		X		X		X		X		X		X	
54TW01	WATER	X		X		X		X		X		X		X		X		X		X	
TB06	WATER	X										X									
TB09A	WATER	X										X									
510-MW2D	WATER	X		X		X		X		X		X		X		X		X		X	
510-DW1	WATER	X		X		X		X		X		X		X		X		X		X	
510-DW2	WATER			X		X		X		X				X		X		X		X	
510-MW03	WATER	X		X		X		X		X		X		X		X		X		X	
510-DW02	WATER	X										X									
510-MW5	WATER	X		X		X		X		X		X		X		X		X		X	
2000FB01	WATER	X		X		X		X		X		X		X		X		X		X	
2000FB02	WATER	X		X		X		X		X		X		X		X		X		X	
Total Billable Samples (Water/Soil)		23	0	18	0	18	0	18	0	18	0	23	0	18	0	18	0	18	0	18	0

VOA= Appendix IX Volatiles
SVOA= Appendix IX Semivolatiles
P/P= Appendix IX Pesticides/PCBs
HERB= Appendix IX Herbicides
DRO= Appendix IX Diesel Range Organics
GRO= Appendix IX Gasoline Range Organics
D/F= Appendix IX Dioxins/Furans
MET= Appendix IX Metals
SUL= Appendix IX Sulfide
CN= Appendix IX Cyanide

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260B Appendix IX; the National Functional Guidelines for Organic Data Review, Region II and NEESA D. All comments made within this report should be considered when examining the analytical results.

SDG # PRNS04

A validation was performed on the Volatile Data from SDG PRNS04. The data was evaluated based on the following parameters.

* Data Completeness
* Holding Times
* GC/MS Tuning
  Calibrations
* Internal Standard Performance
  Blanks
* Surrogate Recoveries
* Laboratory Control Samples
* Matrix Spike/Matrix Spike duplicate
* Field Duplicates
  Compound Identification/Quantitation

* - All criteria were met for this parameter

Calibrations

The initial calibration, analyzed on 12/11/00, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below qualify all positive results as estimated (J) and non detected results as rejected (R).

All Samples	acrolein isobutanol

The continuing calibrations, PQ079/PQ080, PQ094/PQ097 and PQ100/PQ102, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below qualify all positive results as estimated (J) and non detected results as rejected (R).

All Samples	acrolein isobutanol

The continuing calibration, PQ094/PQ097, contained compounds with %Ds greater than 20% and less than 50%. For the samples and non-compliant compounds listed below qualify all positive results as estimated (J).

510-DW1	acetone

Blanks

Reject all laboratory "B" flagged TICs due to blank contamination.

Compound Identification/Quantitation

Do not use the E-flagged compound results in sample 510-MW5 in favor of the corresponding D-flagged compound results in the dilution.

System Performance and Overall Assessment

The data as presented requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
All Samples	acrolein isobutanol	+/-	J/R
All Samples	acrolein isobutanol	+/-	J/R
510-DW1	acetone	+	J
All Samples	"B" flagged TICs	+	R
510-MW5	all E-flagged compounds	+	R
510-MW5 DL	all results except D-flagged compounds	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C Appendix IX; the National Functional Guidelines for Organic Data Review, Region II and NEESA D. All comments made within this report should be considered when examining the analytical results.

SDG # PRNS04

A validation was performed on the Semivolatile Data from SDG PRNS04. The data was evaluated based on the following parameters.

*	Data Completeness
*	Holding Times
*	GC/MS Tuning
	Calibrations
*	Internal Standard Performance
	Blanks
	Surrogate Recoveries
*	Laboratory Control Samples
*	Matrix Spike/Matrix Spike duplicate
*	Field Duplicates
	Compound Identification/Quantitation

* - All criteria were met for this parameter

Calibrations

The initial calibration, analyzed on 11/17/00, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as rejected (R).

510-MW1	1,3,5-trinitrobenzene
54SW01	4-nitroquinoline-1-oxide
510-MW02	aramite-1
54SW01D	
54SW02	
510-MW02D	

The continuing calibration, EQ351, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as rejected (R).

510-MW1	4-nitroquinoline-1-oxide
54SW01	aramite-1
510-MW02	
54SW01D	
54SW02	
510-MW02D	

The continuing calibration, EQ351, contained compounds with %Ds greater than 50% and less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as estimated (UJ).

510-MW1	n-nitrosodimethylamine
54SW01	n-nitrosopiperidine
510-MW02	1,4-phenylenediamine
54SW01D	1,3,5-trinitrobenzene
54SW02	dinoseb
510-MW02D	

The continuing calibration, EQ351, contained compounds with %Ds greater than 20% and less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

54SW01D	pyrene

Calibrations

The initial calibration, analyzed on 01/02/01, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as rejected (R).

2000FB03	4-nitroquinoline-1-oxide
510-MW5	
2000FB01	
2000FB02	
510MW03	
510-DW1	
510-DW2	
510-MW04	
54TW01	
54TW02	

The continuing calibrations, EQ383 and EQ385, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as rejected (R).

2000FB03	4-nitroquinoline-1-oxide
510-MW5	
2000FB01	
2000FB02	
510MW03	
510-DW1	
510-DW2	
510-MW04	
54TW01	
54TW02	

Blank

The blank(s) associated with samples in this SDG exhibited contamination. Qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

Blanks (continued)

Associated blank	Compound	Concentration	Action Level
1221A-EMB	phenol	0.34J ug/L	3.4 ug/L
	di-n-butylphthalate	1.3J	13
1226A-EMB	di-n-butylphthalate	0.48J ug/L	4.8 ug/L
	bis(2-ethylhexyl)phthalate	1.6J	16
	di-n-octylphthalate	1.2J	12

Samples	Compound	Qualification
54SW01D 54SW02 510MW03 510-DW1 510-DW2 510-MW04 54TW01 54TW02 2000FB03 510-MW5	di-n-butylphthalate	CRQL
2000FB03	bis(2-ethylhexyl)phthalate	CRQL
2000FB03	di-n-octylphthalate	CRQL

Reject all "B" flagged TICs due to blank contamination.

Surrogates

Sample 2000FB03 exhibited zero percent recovery for phenol-d5. Qualify all acid fraction compounds with positive results as estimated (J) and non detected compounds as rejected (R).

Compound Identification/Quantitation

Do not use sample 2000FB03RE in favor of the initial analysis, due to non compliant surrogate recoveries.

System Performance and Overall Assessment

The data as presented requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
510-MW1 54SW01 510-MW02 54SW01D 54SW02 510-MW02D	1,3,5-trinitrobenzene 4-nitroquinoline-1-oxide aramite-1	+/-	J/R
510-MW1 54SW01 510-MW02 54SW01D 54SW02 510-MW02D	4-nitroquinoline-1-oxide aramite-1	+/-	J/R
510-MW1 54SW01 510-MW02 54SW01D 54SW02 510-MW02D	n-nitrosodimethylamine n-nitrosopiperidine 1,4-phenylenediamine 1,3,5-trinitrobenzene dinoseb	+/-	J/UJ
54SW01D	pyrene	+	J
2000FB03 510-MW5 2000FB01 2000FB02 510MW03 510-DW1 510-DW2 510-MW04 54TW01 54TW02	4-nitroquinoline-1-oxide	+/-	J/R
2000FB03 510-MW5 2000FB01 2000FB02 510MW03 510-DW1 510-DW2	4-nitroquinoline-1-oxide	+/-	J/R

SUMMARY OF DATA QUALIFICATIONS

Page 2

SAMPLE ID	COMPOUND ID	DL	QL
510-MW04 54TW01 54TW02	4-nitroquinoline-1-oxide	+/-	J/R
54SW01D 54SW02 510MW03 510-DW1 510-DW2 510-MW04 54TW01 54TW02 2000FB03 510-MW5	di-n-butylphthalate	+	CRQL
2000FB03	bis(2-ethylhexyl)phthalate	+	CRQL
2000FB03	di-n-octylphthalate	+	CRQL
All Samples	"B" flagged TICs	+	R
2000FB03	all acid fraction compounds	+/-	J/R
2000FB03RE	all results	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

APPENDIX IX PESTICIDES/PCBs

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8081A and 8082; Region II Data Validation Guidelines SOP HW-23, Revision 0, April 1995, as applicable; and NEESA Level D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG# PRNS04

A validation was performed on the Appendix IX Pesticide/PCB data from SDG PRNS04. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibrations
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Method Deviations

The laboratory did not include calibration verification standards for the multi-component target compounds toxaphene and technical chlordane although the method (SW-846, Method 8081A, Revision 1, December 1996, page 8081A - 12, section 7.4.1.2) requires that "for calibration verification (each 12 hour shift) all target analytes required in the project plan must be injected". The laboratory analyzed five-point initial calibrations for these compounds. There were no positive results reported in these samples for the multi-component pesticides toxaphene or technical chlordane. Therefore, no qualifications were required based on this method deviation.

Calibrations

The continuing calibrations analyzed on 12/27/00 at 09:24 and 10:14 exhibited ten (10) compounds with %Ds greater than 15%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

510-MW1	Heptachlor
54SW01	Endosulfan I
510-MW02	Dieldrin
54SW01D	Endrin
54SW02	4,4'-DDD
510-MW2D	4,4'-DDT
510MW03	Endrin Aldehyde
510-DW1	Methoxychlor
510-DW2	Kepone
510-MW04	Chlorobenzilate
54TW02	
54TW01	

The continuing calibrations analyzed on 12/27/00 at 20:40 and 21:30 exhibited seven (7) compounds with %Ds greater than 15%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

2000FB03	Heptachlor
510-MW5	Heptachlor Epoxide
2000FB01	Dieldrin
2000FB02	Endrin
	4,4'-DDT
	Methoxychlor
	Kepone

Surrogate Recoveries

The following samples exhibited non-compliant surrogate recoveries above and below the QC limits on both columns. The reported positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

510-MW04

The following samples exhibited non-compliant surrogate recoveries below 10%. The reported positive results are qualified as estimated, J, and the non-detect results are rejected, R.

510-MW02
510-MW2D
510-MW03
510-DW1
54TW02
54TW01

System Performance and Overall Assessment

The data required qualifications/rejections.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
510-MW1	Heptachlor	+/-	J/UJ
54SW01	Endosulfan I		
510-MW02	Dieldrin		
54SW01D	Endrin		
54SW02	4,4'-DDD		
510-MW2D	4,4'-DDT		
510MW03	Endrin Aldehyde		
510-DW1	Methoxychlor		
510-DW2	Kepone		
510-MW04	Chlorobenzilate		
54TW02			
54TW01			
2000FB03	Heptachlor	+/-	J/UJ
510-MW5	Heptachlor Epoxide		
2000FB01	Dieldrin		
2000FB02	Endrin		
	4,4'-DDT		
	Methoxychlor		
	Kepone		
510-MW04	All compounds	+/-	J/UJ
510-MW02	All compounds	+/-	J/R
510-MW2D			
510-MW03			
510-DW1			
54TW02			
54TW01			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
HERBICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8151; Region II Data Validation Guidelines SOP No. HW-17, Revision 1.3, November 1994, as applicable; and NEESA D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PRNS04

A validation was performed on the Herbicide Data from SDG PRNS04. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

N = Result is qualified as presumptively present.

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
DIESEL RANGE ORGANICS ANALYSIS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8015; Region II modifications to the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PRNS04

A validation was performed on the Diesel Range Organics Data from SDG PRNS04. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

System Performance and Overall Assessment

The data did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
GASOLINE RANGE ORGANICS ANALYSIS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8015M; Region II modifications to the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PRNS04

A validation was performed on the Gasoline Range Organics Data from SDG PRNS04. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	Calibration
*	•	Blanks
*	•	Internal Standards
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Compound Quantitation

For the following re-analysis, the reported results are rejected, R. The sample was re-analyzed due to high surrogate recovery in the original. The re-analysis confirmed the high recovery.

510-MW5RE

System Performance and Overall Assessment

The data did not require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
510-MW5RE	gasoline	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
DIOXIN/FURANS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard recoveries. This report was prepared in compliance relative to the analytical quality control and deliverable requirements specified in the SW-846 Method 8280 for Dioxin /Furans; the Region II Validation Guidelines, as applicable, and NEESA Level D requirements. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # PRNS04

A validation was performed on the Dioxin/Furans Data from SDG PRNS04. The data was evaluated based on the following parameters.

- * Data Completeness
- * Holding Times
- * Mass Resolution Checks
- * Column Performance
- * Calibrations
- * Internal Standard Recoveries and Performance
- * Method and Field Blanks
- * Matrix Spike/Matrix Spike Duplicate (MS/MSD)
- * Laboratory Control Sample (LCS)
- * Field Duplicate
- * Congener Identification
- * Congener Quantitation

* - All criteria were met for this parameter

Overall Assessment

The overall quality of the data package was acceptable. All data is reported as is without qualification.

GLOSSARY OF DATA VALIDATION QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on the dilution analysis

EMPC = Result value is presumptively present and the reported value is the maximum possible concentration

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	CONGENER ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS, CYANIDE AND SULFIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation for Region II, February 1994, and NEESA Level D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # PRNS04

A validation was performed on the Metals and cyanide and sulfide Data from SDG PRNS04. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
*	●	Calibrations
*	●	Blanks
*	●	Interferences
	●	Matrix Spike Recovery
*	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
*	●	Serial Dilutions

* - All criteria were met for this parameter.

Matrix Spike Recovery results

1. The matrix spike recovery for soils for Manganese (0%) was below 10%. All positive results are qualified as estimated, "J" and all non-detect results are rejected.

2. The matrix spike recoveries for soils for Sulfide (60%) and Mercury (73%) were below the lower control limits (>10% but <75%). All positive and non-detect results are qualified as estimated, "J" and "UJ".

3. All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
1. all soil samples	Mn.	+	J
		U	R
2. all soil samples	S and Hg.	+/U	J/UJ
3. all "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	PRNS08
Date:	March 9, 2001
Client Name:	CH2M Hill
Project/Site Name:	Roosevelt Roads
Date Sampled:	December 17, 2000
Number of Samples:	5 Non-Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	STL Savannah
Validation Guidance:	Region II Data Validation Guidelines SOP HW-23, Revision 0, April 1995
QA/QC Level:	NEESA D
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Appendix IX Pesticides/PCBs

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

For Lisa Juneau
Paul B. Humburg, President

3-9-01
Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# PRNS08

Samples and Fractions Reviewed

Sample Identifications Analytical Fraction

CH2M HILL ID	MATRIX	P/P	
53WP01	SOIL		X
53WP02	SOIL		X
53WP03	SOIL		X
53WP04	SOIL		X
TRIP BLANK	SOIL		X
Total Billable Samples (Water/Soil)		0	5

P/P= Pesticides/PCBs

DATA ASSESSMENT NARRATIVE

APPENDIX IX PESTICIDES/PCBs

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8081A and 8082; Region II Data Validation Guidelines SOP HW-23, Revision 0, April 1995, as applicable; and NEESA Level D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG# PRNS08

A validation was performed on the Appendix IX Pesticide/PCB data from SDG PRNS08. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibrations
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Method Deviations

The laboratory did not include calibration verification standards for the multi-component target compounds toxaphene and technical chlordane although the method (SW-846, Method 8081A, Revision 1, December 1996, page 8081A - 12, section 7.4.1.2) requires that "for calibration verification (each 12 hour shift) all target analytes required in the project plan must be injected". The laboratory analyzed five-point initial calibrations for these compounds. There were no positive results reported in these samples for the multi-component pesticides toxaphene or technical chlordane. Therefore, no qualifications were required based on this method deviation.

It is recommended by the method that the calibration standards be prepared as two calibration mixtures "to minimize potential resolution and quantitation problems on confirmation columns..." (SW-846, Method 8081A, Revision 1, December 1996, page 8081A - 8, section 5.6.1). The initial and continuing calibration standards contained all PISMA and PISMB single component target compounds. There were no qualifications required based on this method deviation.

Calibrations

The continuing calibration analyzed on 12/29/00 at 11:15 exhibited three (3) compounds with %Ds greater than 15%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

53WP01	4,4'-DDD
53WP02	Endosulfan II
53WP04	Methoxychlor
TRIP BLANK	

The continuing calibration analyzed on 01/02/01 at 11:35 exhibited one (1) compound with a %D greater than 15%. For the following sample and non-compliant compound, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

53WP03	Methoxychlor

Surrogate Recoveries

The sample listed below exhibited a high DCB recovery. The positive results are qualified as estimated, J.

53WP01

Compound Quantitation

One (1) sample was diluted to accurately quantitate target compounds. For the following sample, the results for the E flagged compounds are rejected, R, in favor of the results reported from the dilution analysis. All other results from the dilution analysis are rejected, R.

53WP01

All positive results exhibiting column quantitation %Ds greater than 25% but ≤ 70% are qualified as estimated, J.

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
53WP01 53WP02 53WP04 TRIP BLANK	4,4'-DDD Endosulfan II Methoxychlor	+/-	J/UJ
53WP03	Methoxychlor	+/-	J/UJ
53WP01	ALL	+	J
53WP01	All E-Flagged	+E	R
53WP01DL	All except corresponding D-Flagged	+/-	R
All Samples	All P > 25% But ≤ 70%	+	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	PRNS09
Date:	March 9, 2001
Client Name:	CH2M Hill
Project/Site Name:	Roosevelt Roads
Date Sampled:	December 15 - 21, 2000
Number of Samples:	7 Non-Aqueous Sample(s) with 1 MS/MSD(s) 4 Aqueous Sample(s) with 0 MS/MSD(s)
Laboratory:	Severn Trent Laboratories, Inc.
Validation Guidance:	National Functional Guidelines for Organic and Inorganic Data Review, Region II
QA/QC Level:	NEESA D
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Appendix IX (Volatiles, Semivolatiles, Pesticides/PCBs, Herbicides, Diesel Range Organics, Gasoline Range Organics, Dioxins/Furans, Metals, Sulfide and Cyanide)

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

for Lisa Juneau
Paul B. Humburg, President

3-9-01
Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# PRNS09

Samples and Fractions Reviewed

Sample Identifications — Analytical Fractions

CH2M HILL ID	MATRIX	VOA		SVOA		P/P		HERB		DRO		GRO		D/F		MET		SUL		CN	
54SB01-00	SOIL		X		X		X		X		X		X		X		X		X		X
54SB01-05	SOIL		X		X		X		X		X		X		X		X		X		X
54SB01-08	SOIL		X		X		X		X		X		X		X		X		X		X
54SB02-02	SOIL		X		X		X		X		X		X		X		X		X		X
54SB02-06	SOIL		X		X		X		X		X		X		X		X		X		X
54SS10	SOIL		X		X		X		X		X		X		X		X		X		X
54SS10 MS	SOIL		X		X		X		X		X		X		X		X		X		X
54SS10 MSD	SOIL		X		X		X		X		X		X		X		X		X		X
54SS11	SOIL		X		X		X		X		X		X		X		X		X		X
54ER01	WATER	X		X		X		X		X		X		X		X		X		X	
54ER02	WATER	X		X		X		X		X		X		X		X		X		X	
54ER03	WATER	X		X		X		X		X		X		X		X		X		X	
TB10	WATER	X																			
Total Billable Samples (Water/Soil)		4	9	3	9	3	9	3	9	3	9	3	9	3	9	3	9	3	9	3	9

VOA= Appendix IX Volatiles
SVOA= Appendix IX Semivolatiles
P/P= Appendix IX Pesticides/PCBs
HERB= Appendix IX Herbicides
DRO= Appendix IX Diesel Range Organics
GRO= Appendix IX Gasoline Range Organics
D/F= Appendix IX Dioxins/Furans
MET= Appendix IX Metals
SUL= Appendix IX Sulfide
CN= Appendix IX Cyanide

DATA ASSESSMENT AND NARRATIVE

VOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8260B Appendix IX; the National Functional Guidelines for Organic Data Review, Region II and NEESA D. All comments made within this report should be considered when examining the analytical results.

SDG # PRNS09

A validation was performed on the Volatile Data from SDG PRNS09. The data was evaluated based on the following parameters.

* Data Completeness
* Holding Times
* GC/MS Tuning
  Calibrations
  Internal Standard Performance
  Blanks
* Surrogate Recoveries
* Laboratory Control Samples
* Matrix Spike/Matrix Spike duplicate
* Field Duplicates
  Compound Identification/Quantitation

* - All criteria were met for this parameter

Calibrations

The initial calibration, analyzed on 12/17/00, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below qualify all positive results as estimated (J) and non detected results as rejected (R).

54ER01	acrolein
54ER02	isobutanol
54ER03	
TB10	

The continuing calibration, PQ097, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below qualify all positive results as estimated (J) and non detected results as rejected (R).

54ER01	acrolein
54ER02	isobutanol
54ER03	
TB10	

The continuing calibration, LQ481, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below qualify all positive results as estimated (J) and non detected results as rejected (R).

54SB01-00	acrolein
54SB01-08	
54SB02-06	
54SS11	
54SB01-05	
54SB02-02	
54SS10RE	

DATA ASSESSMENT AND NARRATIVE

VOLATILE ANALYSIS

Calibrations

The continuing calibration, LQ481, contained compounds with %DS greater than 20% and less than 50%. For the samples and non-compliant compounds listed below qualify all positive results as estimated (J).

54SB01-08	acetone
54SB02-06	
54SS11	
54SB01-05	
54SB02-02	
54SS10RE	

Internal Standards

The following samples exhibited low internal standard area recoveries for the listed standard. Qualify all results for the associated compounds as estimated (J/UJ).

54SB01-00	1,4-dichlorobenzene-d4
54SS11	
54SS10RE	

Blanks

Reject all laboratory "B" flagged TICs due to blank contamination.

Compound Identification/Quantitation

Do not use the initial analysis of sample 54SS10, in favor of the re-analysis, due to non compliant internal standard area recoveries.

Do not use the re-analysis of 54SS01-00 and 54SS11, in favor of the initial analysis, due to non compliant internal standard area recoveries.

System Performance and Overall Assessment

The data as presented requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
54ER01 54ER02 54ER03 TB10	acrolein isobutanol	+/-	J/R
54ER01 54ER02 54ER03 TB10	acrolein isobutanol	+/-	J/R
54SB01-00 54SB01-08 54SB02-06 54SS11 54SB01-05 54SB02-02 54SS10RE	acrolein	+/-	J/R
54SB01-08 54SB02-06 54SS11 54SB01-05 54SB02-02 54SS10RE	acetone	+	J
54SB01-00 54SS11 54SS10RE	*All Associated Compounds* 1,4-dichlorobenzene-d4	+/-	J/UJ
All Samples	"B" flagged TICs	+	R
54SS10 54SS01-00RE 54SS11RE	all results	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT AND NARRATIVE

SEMIVOLATILE ORGANICS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard areas. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8270C Appendix IX; the National Functional Guidelines for Organic Data Review, Region II and NEESA D. All comments made within this report should be considered when examining the analytical results.

SDG # PRNS09

A validation was performed on the Semivolatile Data from SDG PRNS09. The data was evaluated based on the following parameters.

*	Data Completeness
	Holding Times
*	GC/MS Tuning
	Calibrations
*	Internal Standard Performance
	Blanks
*	Surrogate Recoveries
*	Laboratory Control Samples
*	Matrix Spike/Matrix Spike duplicate
*	Field Duplicates
	Compound Identification/Quantitation

* - All criteria were met for this parameter

Holding Times

Sample 54ER02RE exceeded the seven day extraction holding time by eleven days. Qualify all results as estimated (J/UJ).

Calibrations

The initial calibration, analyzed on 11/17/00, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as rejected (R).

54SB01-00	1,3,5-trinitrobenzene
54SB01-05	4-nitroquinoline-1-oxide
54SB01-08	aramite-1
54SB02-02	
54SB02-06	

The continuing calibration, EQ351, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as rejected (R).

54SB01-00	4-nitroquinoline-1-oxide
54SB01-05	aramite-1
54SB01-08	
54SB02-02	
54SB02-06	

The continuing calibration, EQ351, contained compounds with %Ds greater than 50% and less than 90%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as estimated (UJ).

54SB01-00	n-nitrosodimethylamine
54SB01-05	n-nitrosopiperidine
54SB01-08	1,4-phenylenediamine
54SB02-02	1,3,5-trinitrobenzene
54SB02-06	dinoseb

Calibrations

The continuing calibration, EQ351, contained compounds with %Ds greater than 20% and less than 50%. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J).

54SB01-08	di-n-butylphthalate
54SB02-06	

The initial calibration, analyzed on 01/02/01, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as rejected (R).

54SS10	4-nitroquinoline-1-oxide
54SS11	
54ER01	
54ER03	

The continuing calibrations, EQ384 and EQ386, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as rejected (R).

54SS10	4-nitroquinoline-1-oxide
54SS11	
54ER01	
54ER03	

The initial calibration, analyzed on 01/09/01, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as rejected (R).

54ER02RE	1,4-phenylenediamine
	aramite-1

Calibrations

The continuing calibration, GQ936, contained compounds with RRFs less than 0.050. For the samples and non-compliant compounds listed below, qualify all positive results as estimated (J) and non detected results as rejected (R).

54ER02RE	1,4-phenylenediamine aramite-1

Blank

The blank(s) associated with samples in this SDG exhibited contamination. Qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moisture as associated samples. These factors must be taken into considerations when applying the 5X and 10X criteria to field samples.

Associated blank	Compound	Concentration	Action Level
1226A-EMB	di-n-butylphthalate	0.48J ug/L	4.8 ug/L
	bis(2-ethylhexyl)phthalate	1.6J	16
1226F-EMB	bis(2-ethylhexyl)phthalate	150J ug/Kg	1500 ug/Kg
54ER02	di-n-butylphthalate	0.84J ug/L	8.4 ug/L

Samples	Compound	Qualification
54ER01 54SB02-06	di-n-butylphthalate	CRQL
54ER01 54ER03 54SB01-05 54SB01-08 54SB02-02 54SB02-06	bis(2-ethylhexyl)phthalate	CRQL

Reject all "B" flagged TICs due to blank contamination.

Compound Identification/Quantitation

Do not use sample 54ER02 in favor of the re-analysis, due to non compliant internal standard area and surrogate recoveries.

System Performance and Overall Assessment

The data as presented requires qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
54ER02RE	all results	+/-	J/UJ
54SB01-00 54SB01-05 54SB01-08 54SB02-02 54SB02-06	1,3,5-trinitrobenzene 4-nitroquinoline-1-oxide aramite-1	+/-	J/R
54SB01-00 54SB01-05 54SB01-08 54SB02-02 54SB02-06	4-nitroquinoline-1-oxide aramite-1	+/-	J/R
54SB01-00 54SB01-05 54SB01-08 54SB02-02 54SB02-06	n-nitrosodimethylamine n-nitrosopiperidine 1,4-phenylenediamine 1,3,5-trinitrobenzene dinoseb	+/-	J/UJ
54SB01-08 54SB02-06	di-n-butylphthalate	+	J
54SS10 54SS11 54ER01 54ER03	4-nitroquinoline-1-oxide	+/-	J/R
54SS10 54SS11 54ER01 54ER03	4-nitroquinoline-1-oxide	+/-	J/R
54ER02RE	1,4-phenylenediamine aramite-1	+/-	J/R
54ER02RE	1,4-phenylenediamine aramite-1	+/-	J/R

SUMMARY OF DATA QUALIFICATIONS

Page 2

SAMPLE ID	COMPOUND ID	DL	QL
54ER01	di-n-butylphthalate	+	CRQL
54ER01 54ER03 54SB01-05 54SB01-08 54SB02-02 54SB02-06	bis(2-ethylhexyl)phthalate	+	CRQL
All Samples	"B" flagged TICs	+	R
54ER02	all results	+/-	R

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE

APPENDIX IX PESTICIDES/PCBs

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8081A and 8082; Region II Data Validation Guidelines SOP HW-23, Revision 0, April 1995, as applicable; and NEESA Level D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualifications table.

SDG# PRNS09

A validation was performed on the Appendix IX Pesticide/PCB data from SDG PRNS09. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibrations
*	•	Blanks
	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Method Deviations

The laboratory did not include calibration verification standards for the multi-component target compounds toxaphene and technical chlordane although the method (SW-846, Method 8081A, Revision 1, December 1996, page 8081A - 12, section 7.4.1.2) requires that "for calibration verification (each 12 hour shift) all target analytes required in the project plan must be injected". The laboratory analyzed five-point initial calibrations for these compounds. There were no positive results reported in these samples for the multi-component pesticides toxaphene or technical chlordane. Therefore, no qualifications were required based on this method deviation.

It is recommended by the method that the calibration standards be prepared as two calibration mixtures "to minimize potential resolution and quantitation problems on confirmation columns..." (SW-846, Method 8081A, Revision 1, December 1996, page 8081A - 8, section 5.6.1). The continuing calibration standards contained all PISMA and PISMB single component target compounds. The initial calibration standards for these compounds were properly analyzed as two mixtures. There were no qualifications required based on this method deviation.

Calibrations

The continuing calibration analyzed on 01/02/01 at 18:12 exhibited five (5) compounds with %Ds greater than 15%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

All Samples	Heptachlor
	Endrin
	Endosulfan II
	4,4'-DDT
	Methoxychlor

The continuing calibration analyzed on 01/02/01 at 19:02 exhibited two (2) compounds with %Ds greater than 15%. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

All Samples	Chlorobenzilate
	Kepone

Surrogate Recoveries

The sample listed below exhibited low TCX recoveries. The positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

54ER03

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
All Samples	Heptachlor Endrin Endosulfan II 4,4'-DDT Methoxychlor	+/-	J/UJ
All Samples	Chlorobenzilate Kepone	+/-	J/UJ
54ER03	ALL	+/-	J/UJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
HERBICIDES

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8151; Region II Data Validation Guidelines SOP No. HW-17, Revision 1.3, November 1994, as applicable; and NEESA D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PRNS09

A validation was performed on the Herbicide Data from SDG PRNS09. The data was evaluated based on the following parameters:

*	•	Data Completeness
	•	Holding Times
	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Holding Times

The Region II extraction holding time of seven (7) days for soil samples was exceeded by one (1) to six (6) days for all soil samples. For the following samples, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

All Soil Samples

Calibrations

The continuing calibration analyzed on 01/03/01 at 19:49 exhibited two (2) compounds with %Ds greater than 15% for which qualifications were required. For the following samples and non-compliant compounds, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

All Soil Samples	2,4-D
	2,4,5-T

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
All Soil Samples	ALL	+/-	J/UJ
All Soil Samples	2,4-D 2,4,5-T	+/-	J/UJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
DIESEL RANGE ORGANICS ANALYSIS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8015; Region II modifications to the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PRNS09

A validation was performed on the Diesel Range Organics Data from SDG PRNS09. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	Calibration
	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Method Blanks

One (1) associated method blank exhibited contamination for target compounds and qualifications were required. The end user should note that the action levels indicated for the blank analysis may not involve the same weights, volumes, dilution factors, or percent moistures as associated samples. These factors must be taken into consideration when applying the 5X criteria to field samples. The method blank results were compared to the associated samples.

Blank ID	Compound	Concentration	Action Level
1226W-SMB	Diesel	1.5 J mg/Kg	7.5 mg/Kg

The following samples have been qualified for method blank contamination. The qualifications are for all the blanks.

Sample	Compound	Qualification
54SB01-05	DRO	RL
54SB02-06		
54SB01-00		
54SS11		
54SS10		
54SB01-08	DRO	U
54SB02-02		

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
54SB01-05	DRO	+B	RL
54SB02-06			
54SB01-00			
54SS11			
54SS10			
54SB01-08	DRO	+B	U
54SB02-02			

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
GASOLINE RANGE ORGANICS ANALYSIS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance, and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Method 8015M; Region II modifications to the National Functional Guidelines for Organic Data Review, October 1999, as applicable; and NEESA D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG # PRNS09

A validation was performed on the Gasoline Range Organics Data from SDG PRNS09. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	Calibration
*	•	Blanks
	•	Internal Standards
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Field Duplicates
*	•	Compound Identification
*	•	Compound Quantitation

* - All criteria were met for this parameter.

Internal Standards

One (1) sample exhibited a low internal standard area. For the following sample, the positive results are qualified as estimated, J, and the non-detect results are qualified as estimated, UJ.

54SS10

System Performance and Overall Assessment

The data required qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported Quantitation limit is qualified as estimated

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 5X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
54SS10	Gasoline	+/-	J/UJ

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
\+ in the DL column denotes a positive result
\- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
DIOXIN/FURANS

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike recoveries, GC/MS performance, tuning results, calibration results and internal standard recoveries. This report was prepared in compliance relative to the analytical quality control and deliverable requirements specified in the SW-846 Method 8280 for Dioxin /Furans; the Region II Validation Guidelines, as applicable, and NEESA Level D requirements. All comments made within this report should be considered when examining the analytical results (Form I's).

SDG # PRNS09

A validation was performed on the Dioxin/Furans Data from SDG PRNS09. The data was evaluated based on the following parameters.

- * Data Completeness
- * Holding Times
- * Mass Resolution Checks
- * Column Performance
- * Calibrations
- * Internal Standard Recoveries and Performance
- * Method and Field Blanks
- * Matrix Spike/Matrix Spike Duplicate (MS/MSD)
- * Laboratory Control Sample (LCS)
- * Field Duplicate
- * Congener Identification
- * Congener Quantitation

* - All criteria were met for this parameter

Overall Assessment

The overall quality of the data package was acceptable. All data is reported as is without qualification.

GLOSSARY OF DATA VALIDATION QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

UR = Result is rejected and unusable

D = Result ~~value~~ is based on the dilution analysis

EMPC = Result value is presumptively present and the reported value is the maximum possible concentration

METHOD BLANK QUALIFICATION CODES

CRQL = The sample result for the blank contaminant is less than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is rejected and the CRQL for that compound is reported.

U = The sample result for the blank contaminant is greater than the sample CRQL and is less than 10X the method blank value. The sample result for the blank contaminant is qualified as non detected at the compound value reported.

No Action = The sample result for the blank contaminant is greater than the sample CRQL and is greater than 10X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	CONGENER ID	DL	QL

NO QUALIFICATIONS WERE REQUIRED

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS, CYANIDE AND SULFIDE

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation for Region II, February 1994, and NEESA Level D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each categ~~ory~~ to the Summary of Data Qualification table.

SDGs # PRNS09

A validation was performed on the Metals, cyanide and sulfide Data from SDG PRNS09. The data was evaluated based on the following parameters.

*	•	Data Completeness
*	•	Holding Times
	•	Calibrations
*	•	Blanks
*	•	Interferences
	•	Matrix Spike Recovery
*	•	Matrix Duplicates
*	•	Field Duplicates
*	•	Laboratory Control Samples
	•	Serial Dilutions

* - All criteria were met for this parameter.

Calibration Verification Standard results

1. The all Calibration Verification Standards (CRI) for Thallium were below than 80%. All non-detect results are qualified as estimated, "UJ".

Matrix Spike Recovery results

2. The matrix spike recoveries for soils for Antimony (34%), Sulfide (60%) and Chromium (74%) were below the lower control limits (>10% but <75%). All positive and non-detect results are qualified as estimated, "J" and "UJ".

3. The matrix spike recoveries for Copper (177%) and Mercury (154%) were above the upper control limits (>125% but <200%). All positive results are qualified as estimated, "J".

Serial Dilution results

4. The serial dilution results for soils for Zinc were greater than 10% but less than 100%. All positive results are qualified as estimated, "J".

5. All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
1. all soil samples	Tl.	+/U	J/UJ
2. all soil samples	Sb, S and Cr.	+/U	J/UJ
3. all soil samples	Cu and Hg.	+	J
4. all soil samples	Zn.	+	J
5. all "B" results	all analytes	B	J

HEARTLAND
ENVIRONMENTAL SERVICES, INC.

Data Validation Report

SDG#:	PRNS02
Date:	January 19, 2001
Client Name:	CH2M Hill
Project/Site Name:	Roosevelt Roads CTO-99
Date Sampled:	December 13 - 14, 2000
Number of Samples:	11 Non-Aqueous Sample(s) with 1 MS/MSD(s)
Laboratory:	Severn Trent Laboratories, Inc.
Validation Guidance:	National Functional Guidelines for Organic Data, October, 1999 and Inorganic Data, February, 1994, Region II Modifications
QA/QC Level:	NEESA D
Method(s) Utilized:	SW846 Third Edition
Analytical Fractions:	Pesticides/PCBs and Metals

Analytical data in this report were screened to determine usability of results and also to determine contractual compliance relative to these requirements and deliverables. This screening assumes analytical results are correct as reported and merely provides an interpretation of the reported quality control results. A minimum of 10% of all laboratory calculations have been verified as part of this validation. All instrument output, i.e. spectra, chromatograms, etc., for each sample have been carefully reviewed. The end-user is urged to review the Specific Findings and associated Data Qualifications presented in this report. Annotated Form 1s or spreadsheets for all samples reviewed are included after the Data Assessment Narratives. Form 1s for MS/MSD samples or spreadsheets are not annotated.

The release of this Data Validation Report is authorized by the following signature:

Craig G. Searfoss
Paul B. Humburg, President

1-19-01.
Date

4127 Plaza 94 South • St. Charles, MO 63304
(636) 936-1332 • Fax (636) 936-1335

SDG# PRNS02

Samples and Fractions Reviewed

Sample Identifications Analytical Fractions

CH2M HILL ID	MATRIX	P/P		MET	
53SB01-00	SOIL		X		X
53SB01-03	SOIL		X		X
53SB01-05	SOIL		X		X
53SB02-00	SOIL		X		X
53SB02-00 MS	SOIL		X		X
53SB02-00 MSD	SOIL		X		X
53SB02-02	SOIL		X		X
53SB02-00D	SOIL		X		X
53SB03-00	SOIL		X		X
53SB03-01	SOIL		X		X
53SB04-00	SOIL		X		X
53SB04-02	SOIL		X		X
53SB04-00D	SOIL		X		X
Total Billable Samples (Water/Soil)		0	13	0	13

P/P= Pesticides/PCBs
MET= Metals

DATA ASSESSMENT NARRATIVE

PESTICIDES/PCBs BY METHOD 8081/8082

General

The organic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, surrogate and matrix spike recoveries, GC performance and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW-846 Methods 8081/8082; the Region II Validation Guidelines, SOP HW-23, April 1995, and NEESA Level D requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDG #PRNS02

A validation was performed on the Pesticides/PCBs Data from SDG PRNS02. The data was evaluated based on the following parameters:

*	•	Data Completeness
*	•	Holding Times
*	•	GC Performance
	•	Calibration
*	•	Blanks
*	•	Surrogate Recoveries
*	•	Matrix Spike/Matrix Spike Duplicates
*	•	Pesticide/Aroclor Clean-Up Checks
	•	Field Duplicates
*	•	Compound Identification
	•	Compound Quantitation

* - All criteria were met for this parameter.

Calibrations

The continuing calibration standard JDC21022.D exhibited four (4) compounds with %D's greater than 20% but less than 90% on one or both columns. For the following samples and compounds, the reported positive and non-detect results were qualified as estimated, J/UJ.

All Samples	dieldrin (15.2%)
	endrin (24.4%)
	endrin aldehyde (23.1%)
	methoxychlor (18.2%)

Field Duplicates

The following field duplicate pairs exhibited non-compliant RPDs for reported positive results greater than the compound CRQLs. The reported positive results are qualified as estimated, J, for the noted compounds.

53SB02-00	4,4'-DDE
53SB02-00D	4,4'-DDT
53SB04-00	4,4'-DDE
53SB04-00D	4,4'-DDT

Compound Quantitation

Several samples exhibited column quantitation %Ds greater than 25%. The following guidelines were used to qualify the data:

1. The positive sample result which exhibited a column quantitation difference >25%, but ≤70% is qualified as estimated, J.

The following samples and compounds have been qualified for high column quantitation %Ds.

Sample ID	Compound	%D	Lab Qual.	HESI Qual.
53SB02-00	4,4'-DDD	50	P	J
53SB02-00D	4,4'-DDD	44.7	P	J
53SB03-00	4,4'-DDE	27.3	P	J
53SB04-00	heptachlor	43.7	P	J

System Performance and Overall Assessment

The data, as reported, did require qualifications.

GLOSSARY OF DATA QUALIFIERS

QUALIFICATION CODES

U = Not detected

J = Estimated value

UJ = Reported quantitation limit is qualified as estimated

NJ = Result is considered presumptively present at an estimated concentration

R = Result is rejected and unusable

D = Result value is based on dilution analysis

METHOD BLANK QUALIFICATION CODES

CRQL =	The sample result is greater than the CRQL and less than five times (5X) the blank value. Reject the sample result and report the CRQL qualified as non-detect, U.
U =	The sample result is less than the CRQL and less than five times (5X) the blank value. Qualify the sample result as non-detect, U.
No Action =	The sample result for the blank contaminant is greater than the sample CRQL and is greater than 5X the method blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.

SUMMARY OF DATA QUALIFICATIONS

SAMPLE ID	COMPOUND ID	DL	QL
All Samples	dieldrin (15.2%) endrin (24.4%) endrin aldehyde (23.1%) methoxychlor (18.2%)	+/-	J/UJ
53SB02-00 53SB02-00D	4,4'-DDE 4,4'-DDT	+	J
53SB04-00 53SB04-00D	4,4'-DDE 4,4'-DDT	+	J
53SB02-00	4,4'-DDD	+P	J
53SB02-00D	4,4'-DDD	+P	J
53SB03-00	4,4'-DDE	+P	J
53SB04-00	heptachlor	+P	J

* DL denotes the Form I qualifier supplied by the laboratory
QL denotes the qualifier used by the data validation firm
+ in the DL column denotes a positive result
- in the DL column denotes a non detect result

DATA ASSESSMENT NARRATIVE
METALS

General

The inorganic findings offered in this screening report assumes that all analytical results are correct as reported and is based upon the examination of the reported holding times, blank analysis results, matrix spike and LCS recoveries, matrix duplicates and calibration results. This report was prepared in compliance relative to the analytical and deliverable requirements specified in the SW846 methods: the Functional Guidelines for Inorganic Data Validation for Region II, February 1994, and DQO Level IV requirements. All comments made within this report should be considered when examining the analytical results. Please refer the specific findings found in each category to the Summary of Data Qualification table.

SDGs # PRNS02

A validation was performed on the Metals Data from SDG PRNS02. The data was evaluated based on the following parameters.

*	●	Data Completeness
*	●	Holding Times
	●	Calibrations
*	●	Blanks
*	●	Interferences
	●	Matrix Spike Recovery
	●	Matrix Duplicates
*	●	Field Duplicates
*	●	Laboratory Control Samples
*	●	Serial Dilutions

* - All criteria were met for this parameter.

Calibration Verification Standard results

1. The first Calibration Verification Standard (CRI) for Arsenic (123%) was greater than 120%. All positive results for the first half of samples within the affected range are qualified as estimated, "J". The samples included are 53SB01-00, 53SB01-03, 53SB01-05 and 53SB092-00.

Matrix Spike Recovery results

2. The matrix spike recovery for soils for Antimony (41%) and Mercury (70%) were below the lower control limits (>10% but <75%). All positive and non-detect results are qualified as estimated, "J" and "UJ".

3. The matrix spike recoveries for soils for Barium (135%), Cadmium (139%), Chromium (181%) and Tin (132%) were above the upper control limits (>125% but <200%). All positive results are qualified as estimated, "J".

4. The matrix spike recovery for soils for Lead (870%) was greater than 200%. All positive results are rejected.

Matrix Spike Duplicate RPD results

5. The matrix duplicate RPD results for soils for Lead (101%) and Zinc (151%) were greater than 100%. All positive results are qualified as estimated, "J".

6. All sample results left with a "B" qualifier after all other qualifications, will be qualified with a "J" qualifier in place of the "B". Value is below the CRDL but greater than the IDL.

SUMMARY OF DATA QUALIFICATIONS

Sample ID	Analyte	DL	QL
1. 53SB01-00, 53SB01-03, 53SB01-05 and 53SB02-00.	As.	+	J
2. all soil samples	Sb and Hg.	+/U	J/UJ
3. all soil samples	Ba, Cd, Cr and Sn.	+	J
4. all soil samples	Pb.	+	R
5. all soil samples	Pb and Zn.	+	J
6. all "B" results	all analytes	B	J

Baker

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April 11, 2001

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

Attn: Ms. Nicoletta DiForte
Chief, RCRA Caribbean Section

Re: Contract N62470-95-D-6007
Navy CLEAN, District III
Contract Task Order (CTO) 0099
U.S. Naval Station, Roosevelt Roads (NSRR), Puerto Rico
RCRA/HSWA Permit No. PR2170027203
Draft Sampling and Analysis Report for SWMUs 53 and 54

Dear Ms. DiForte:

Baker Environmental, Inc. (Baker), on behalf of the Navy, is pleased to provide you with two copies of the Draft Sampling and Analysis Report for SWMUs 53 and 54 for your review. This report has been prepared in accordance with Module III.C.5 of the NSRR RCRA Part B Permit. Additional distribution has been made as indicated below.

Please do not hesitate to contact me at (412) 269-2009, or Mr. Christopher T. Penny at LANTDIV at (757) 322-4815, if you have any questions.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Mark E. Kimes, P.E.
Activity Coordinator

MEK/lp
Attachments

cc: Mr. Christopher T. Penny, LANTDIV - Code EV23 (3 copies)
Ms. Madeline Rivera, NSRR (4 copies)
Mr. Tim Gordon, US EPA Region II (2 copies)
Mr. Carl Soderberg, US EPA Caribbean Office (1 copy)
Ms. Constance Crossley, Booz Allen & Hamilton (1 copy)
PREQB (2 copies)
Mr. John Tomik, CH2M Hill Virginia Beach (1 copy)