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FOCUSED REMEDIAL ACTION PLAN FOR SITE 250 NS MAYPORT FL  
12/1/2005  
TETRA TECH NUS

# Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-94-D-0888



Rev. 0  
12/20/05

## Focused Remedial Action Plan for Site 250

Naval Station Mayport  
Mayport, Florida

Contract Task Order 0303

December 2005



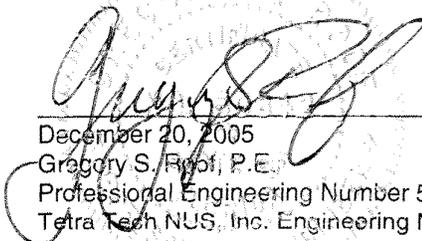
Southern Division

Naval Facilities Engineering Command  
2155 Eagle Drive

North Charleston, South Carolina 29406



The professional opinions rendered in this document identified as Focused Remedial Action Plan for Building 250, Naval Station Mayport, Mayport, Florida were developed in general accordance with commonly accepted procedures consistent with applicable standards of practice. This document was prepared under the supervision of the signing engineer and is based on information obtained from others. If conditions are determined to exist differently than those described in this document, then the undersigned professional engineer should be notified to evaluate the effects of any additional information on the project described in this document.



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December 20, 2005  
Gregory S. Ryot, P.E.  
Professional Engineering Number 50842  
Tetra Tech NUS, Inc. Engineering No. 7988

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## ACRONYMS

ASTs	Aboveground Storage Tanks
BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylenes
bls	Below Land Surface
CLEAN	Comprehensive Long-term Environmental Action Navy
COCs	Constituents of Concern
CTO	Contract Task Order
DPT	Direct Push Technology
DRO	Diesel Range Organics
EEG	Ellis Environmental Group
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FID	Flame Ionization Detector
FL-PRO	Florida Petroleum Range Organics
FLUCL	Florida UCL
ft	Feet (Foot)
GAG	Gasoline Analytical Group
GCTLs	Groundwater Cleanup Target Levels
HASP	Health and Safety Plan
ICs	Institutional Controls
KAG	Kerosene Analytical Group
µg/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MPT	Mayport Partnering Team
msl	Mean Sea Level
MTBE	Methyl Tertiary-Butyl Ether
NAVFAC EFD SOUTH	Southern Division, Naval Facilities Engineering Command
NAVSTA	Naval Station
Navy	United States Navy
OVA	Organic Vapor Analyzer
PAHs	Polynuclear Aromatic Hydrocarbons
ppm	Parts per Million
PWC	Public Works Center
RAP	Remedial Action Plan
SA	Site Assessment

## ACRONYMS (Continued)

SAR	Site Assessment Report
SCTLs	Soil Cleanup Target Levels
TOC	Top of Casing
TRPH	Total Recoverable Petroleum Hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
UCL	Upper Confidence Level
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds
yd <sup>3</sup>	cubic yards

## EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (TtNUS) has completed a Focused Remedial Action Plan (RAP) at Site 250 at Naval Station (NAVSTA) Mayport in general accordance with the requirements of Chapter 62-770.700, Florida Administrative Code (FAC), except as detailed herein. This Focused RAP is being submitted to the Florida Department of Environmental Protection (FDEP) for approval.

TtNUS performed the following tasks during the preparation of this Focused RAP:

- Reviewed the information provided in the Site Assessment Report (SAR) (TtNUS, 2004).
- Evaluated the NAVSTA Mayport Partnering Team (MPT) recommended treatment option for soil contamination at Site 250.
- Prepared this Focused RAP to provide a conceptual outline for soil excavation at Site 250.
- Specified a quarterly groundwater monitoring plan for Site 250.

In this Focused RAP, Chapter 62-770.700, FAC, was not followed in its entirety. Chapter 62-770.700(3)(e)(2), FAC, stipulates that a RAP should include the results of an evaluation of remedial alternatives and a discussion of why other remedial alternatives considered were rejected based on criteria specified. Statistical analysis determined that a removal of source area soils would reduce the 95% upper confidence level (UCL) for the site to be less than FDEP soil cleanup target levels (SCTLs) for industrial direct exposure. As a result, the MPT determined that a site closure strategy would be pursued to remove source area soils and to establish institutional controls (ICs) to prevent future development of the site for residential purposes (TtNUS, 2004). Therefore, per agreements by the MPT members, additional remedial treatment alternatives were not evaluated and compared in this Focused RAP.

This Focused RAP identified soil excavation and off-site disposal as the selected remedial treatment option to address soil contamination at Site 250. Soil impacts greater than the FDEP industrial and leachability SCTLs were identified at two locations. One impacted location was associated with an adjacent storm sewer, and the other impacted location was near two former aboveground storage tanks (ASTs) and one former underground storage tank (UST) locations. Naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, and total recoverable petroleum hydrocarbons (TRPH) were the four most frequently detected compounds reported during the assessment. A statistical evaluation of site data was conducted and presented in the SAR subsequently approved by the FDEP. Through discussions with the MPT, it was determined that approximately 100 cubic yards (yd<sup>3</sup>) of soil near the locations of the former

ASTs and UST should be removed and replaced with clean backfill in order to remain conservative with the excavation of impacted soils at Site 250. This limited excavation will result in the site soil achieving a 95% UCL concentration less than FDEP SCTLs for direct industrial exposure and an industrial usage IC being implemented at Site 250.

No remedial technology is required to address groundwater at Site 250 since assessment results indicated no constituents in excess of FDEP groundwater cleanup target levels (GCTLs) were present. Once the impacted soil is excavated and transported to an off-site disposal facility, groundwater at the site will be monitored for a minimum of one year in accordance with the requirements of Chapter 62-770, FAC. Completion of these remedial actions and successful results of subsequent groundwater monitoring should allow for closure of the site under Risk Management Option Level II (Chapter 62-770, FAC).

## 1.0 INTRODUCTION

### 1.1 PURPOSE AND SCOPE

This Focused RAP was prepared by TtNUS for the United States Navy (Navy) Southern Division, Naval Facilities Engineering Command (NAVFAC EFD SOUTH) under Contract Task Order (CTO) 0303, for the Comprehensive Long-term Environmental Action Navy (CLEAN) III Contract Number N62467-94-D-0888. The Focused RAP was prepared to evaluate excavation as the recommended treatment option for the contaminated soil at Site 250 at NAVSTA Mayport, Mayport, Florida (see Figure 1-1 in Appendix A).

Site 250 has been investigated on several occasions dating back to 1998. Ellis Environmental Group (EEG) excavated and removed a 12,500-gallon UST containing waste oil from the site in July 1998. Prior to UST excavation and removal, soil samples collected from a stained area in the tank pit were found to contain several waste oil constituents at concentrations exceeding FDEP SCTLs. Two limited assessments were performed in the area of the removed waste oil UST subsequent to tank removal. In 2002, two 10,000-gallon ASTs containing fuel oil, located south of the waste oil UST, were also removed by EEG, but no assessment of environmental media was reportedly performed during the removal of these tanks. From August 2003 through May 2004, a Site Assessment (SA) was conducted at Site 250 by TtNUS. This effort was undertaken to evaluate the extent and magnitude of petroleum hydrocarbons in soils and groundwater at Site 250 resulting from past fuel storage at the site.

The purpose of this Focused RAP is to evaluate the MPT recommended remedial treatment option that will remediate the soil and groundwater in accordance with the requirements of Chapter 62-770, FAC. This Focused RAP will evaluate whether the selected treatment option protects human health and the environment, reduces petroleum concentrations within impacted soil and groundwater, and retards further migration of contaminants to downgradient areas. The goal of the remedial action is to allow for closure of the site under Risk Management Option Level II in accordance with Chapter 62-770, FAC.

This Focused RAP identified soil excavation and off-site disposal as the selected remedial treatment option to address soil contamination at Site 250. Soil impacts greater than the FDEP industrial and leachability SCTLs were identified at two locations. One impacted location was associated with an adjacent storm sewer and the other impacted location was near two former ASTs and one former UST locations. Naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, and TRPH were the four most frequently detected compounds reported during the assessment. A statistical evaluation of site data was conducted and presented in the SAR subsequently approved by the FDEP. Through discussions with the MPT, it was determined that approximately 100 yd<sup>3</sup> of soil near the locations of the former ASTs and UST should be removed and replaced with clean backfill in order to remain conservative with the excavation of

impacted soils at Site 250. This limited excavation will result the site soil achieving a 95% UCL concentration less than FDEP SCTLs for direct industrial exposure and an industrial usage IC being implemented at Site 250.

## **1.2 SITE DESCRIPTION**

NAVSTA Mayport is located within the corporate limits of the city of Jacksonville, Duval County, Florida, approximately 12 miles to the northeast of downtown Jacksonville, and adjacent to the town of Mayport. The station complex is located on the northern end of the peninsula bound by the Atlantic Ocean to the east and the St. Johns River to the north and west. NAVSTA Mayport occupies the entire northern part of the peninsula except for the town of Mayport, which is located to the west between the station and the St. Johns River (see Figure 1-1 in Appendix A).

Site 250 is located northeast of the intersection of Massey Avenue and Maine Street. The site is located near the center of the base adjacent to Delta Pier and approximately 175 feet (ft) west of the turning basin (see Figure 1-2 in Appendix A). The area of investigation is centered on the location where two 10,000-gallon fuel oil ASTs and one 12,500-gallon waste oil UST were removed.

Surface features in the area of investigation are showing on a site plan provided in Figure 1-5 (see Appendix A). The northern edge of a long, narrow storm water retention pond trending southeast to northwest is southeast of the former tank hold. The removed waste oil UST and two fuel oil ASTs were located in what is now an area covered with grass extending approximately 80 ft northward from the retention pond. Building 234, a corrugated metal building, is located approximately 60 ft west of this grassy area. Areas to the north and west of the grass area and to the north and east of the retention pond are also paved with asphalt, primarily for parking. The Mayport Turning Basin is located approximately 175 ft east of the grass area where the tanks were formerly located.

## **1.3 SITE HISTORY**

A 12,500-gallon UST was installed in 1980 for storage of waste oils prior to burning of the oils in a boiler used to produce steam. The tank was removed by EEG in July 1998. A copy of the Tank Closure Report is provided in Appendix B. Prior to tank excavation, EEG collected stained soil samples and sludge samples from the impacted soils. These samples were analyzed for TRPH, metals, polynuclear aromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs) to determine if the stained soil was to be characterized as hazardous waste by toxicity. Based on analytical results, the soils were not classified as hazardous waste. However, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were identified at concentrations exceeding the respective FDEP criteria, and TRPH was reported at a concentration of 28,000 milligrams per kilogram (mg/kg), exceeding its FDEP SCTL for industrial direct

exposure, 2,500 mg/kg. All “excessively contaminated soil” (25 yd<sup>3</sup>), as defined by Chapter 62-770.200(19), FAC, was reportedly removed and transported off site for disposal. Additionally, approximately 2,000 gallons of sludge and petroleum contact water were pumped from the tank and disposed of off-site under a non-hazardous materials manifest. There was no reference in the report to the condition of the removed waste oil UST.

The performance of additional site assessment was requested by NAVFAC EFD SOUTH. Consequently, TtNUS completed a limited site investigation of the former waste oil UST area in March 1999 using direct push technology (DPT). A copy of the Limited Site Assessment Letter Report is provided in Appendix C. Soil samples collected 0 to 2 ft below land surface (bls), 2 to 4 ft bls, and 4 to 6 ft bls at six boring locations in and around the former waste oil UST were screened for organic vapor content using an organic vapor analyzer (OVA) equipped with a flame ionization detector (FID). Organic vapor concentrations exceeding 50 parts per million (ppm), indicative of “excessively contaminated soil”, were recorded on four of the six samples collected 4 to 6 ft bls and on three of the samples collected 2 to 4 ft bls. Two samples from the depth interval 4 to 6 ft bls had readings greater than 1000 ppm. No organic vapors were detected in the surface samples (0 to 2 ft bls).

Four soil samples collected 4 to 6 ft bls and two groundwater samples collected from temporary well points were analyzed by a fixed-base laboratory for waste oil parameters listed in Chapter 62-770, FAC. TRPH was the only targeted constituent identified by the laboratory at concentrations exceeding regulatory criteria. Three of the four samples had reported TRPH concentrations exceeding the FDEP SCTL for industrial direct exposure, 2,500 mg/kg, the highest being 6,700 mg/kg, and one groundwater sample had a reported TRPH concentration of 11,000 micrograms per liter (µg/L), exceeding the FDEP GCTL of 5,000 µg/L.

During late August to early September 1999, Public Works Center (PWC) Norfolk screened the soil in and around the area surrounding the removed UST and the two existing 10,000-gallon fuel oil ASTs in search of contamination. A letter report containing field notes and laboratory soil analytical data compiled during the investigation is provided in Appendix D. Fourteen soil samples from five boring locations were collected and analyzed for diesel range organics (DRO). DRO was identified in six of the soil samples, all located west or northwest of the former UST location in the direction of Building 234. The highest concentration was 8,900 mg/kg DRO in a sample collected 4 to 6 ft bls northwest of the removed tank. PWC hypothesized that contamination at the site was following a “linear track,” noting that it (the contamination) “was observed to diminish to zero only a few feet from known ‘hot spots’,” and suspected that a subsurface utility conduit was acting as a transmitter of contaminants.

In November 2002, the two 10,000-gallon fuel oil ASTs, located south of the former waste oil UST, were removed by EEG. A copy of the Letter Closure Report, submitted on December 17, 2002, is included in Appendix E. Initially, 200 gallons of diesel fuel/rainwater mixture were pumped from the two tanks. The tanks and piping were then washed, generating 160 gallons of petroleum contact water. The two quantities of wastewater were tracked by individual manifests and disposed of off-site. A soil and groundwater quality investigation was not conducted in the area underlying the ASTs after their removal. No reference to the structural condition of the ASTs is provided.

TtNUS completed a SA to determine the extent of petroleum hydrocarbons in soil and groundwater at Site 250. The data collected during the investigation was used to prepare a SAR as required by Chapter 62-770.600, FAC. The SAR was completed and submitted to the FDEP on December 29, 2004. Analytical data generated during the SA at Site 250 indicates that discharges of regulated substances previously stored at the site (waste oil and fuel oil) have occurred. Reported concentrations of targeted constituents in soil samples and distribution of contaminants in these media are typical of fuel storage operations where overspills or minor releases may have occurred accidentally during filling operations or during tank excavation and removal events, but are not indicative of persistent releases occurring over extended time periods. In the area where the waste oil tank was buried, soil tests were performed for hazardous waste determination, and the removal area was backfilled. No groundwater impacts in excess of FDEP GCTLs were identified.

#### **1.4 REPORT ORGANIZATION**

This report is organized into seven sections. Below is a list of the sections and a brief description of their purpose:

Section 1.0	Introduction	Summarizes the report's purpose, scope, site information, and report organization.
Section 2.0	SAR Findings and Conclusions	Reviews the approved SAR, and summarizes the SAR's findings and conclusions.
Section 3.0	Focused RAP Goals	Establishes the soil treatment objectives for the remedial system/plan.
Section 4.0	Contaminant Distribution	Estimates the mass of contaminants in the soil.
Section 5.0	Remedial Treatment Option	Presents the treatment option for remediation at the site and develops budgetary costs for the option.
Section 6.0	Source Removal Plan	Presents all of the assumptions made and provides the detailed source removal plan including post-excavation quarterly groundwater monitoring.
	References	Lists all references used.

## **2.0 SITE ASSESSMENT REPORT FINDINGS AND CONCLUSIONS**

A SA was conducted at Site 250 by TtNUS to evaluate the extent of petroleum hydrocarbons in soil and groundwater at the site. Soil and groundwater quality were assessed at the site in two phases: a screening phase (Phase I) in which soil and groundwater grab samples were collected by DPT methods and analyzed by an on-site mobile laboratory; and a second phase (Phase II) in which additional soil samples were collected for fixed-base laboratory analysis, and permanent monitoring wells were installed at optimum locations based upon Phase I analytical results. A SAR was submitted to the MPT in December 2004. The following is a summary of the SAR.

### **2.1 LITHOLOGIC FINDINGS**

The most resolute description of material underlying Site 250 was obtained during retrieval of 5-ft macrocore samples collected by DPT during advancement of deep boring SB-11 to 40 ft bls on August 12, 2003. Soil cuttings generated during excavation of monitoring well boreholes by hollow stem augurs were also described by TtNUS' on-site scientist. Soil boring logs are contained within the SAR.

Soils encountered in the upper 40 ft were exclusively clastic, consisting of (in order of abundance) fine and very fine sand, shell hash, and silt and clay. Silt and clay components were disseminated; thus, no confining units were encountered. Generally, little to no silt or clay was encountered in the upper 25 ft, and the highest silt-plus-clay content (approximately 5 to 10 percent) occurred between 25 and 30 ft bls. Shell hash was most abundant from 5 to 20 ft bls and from 30 to 40 ft bls. Sediments were light brown to white in the upper 20 ft and became light greenish brown to olive gray from 20 to 40 ft bls. This area near the Mayport Turning Basin has been backfilled.

### **2.2 CONTAMINATED SOIL ASSESSMENT**

The vertical and horizontal extent of petroleum impacted soil in the vadose zone was assessed through soil vapor analysis performed during the soil boring investigation and monitoring well installation described in the SAR (TtNUS, 2004).

During the SA field activities performed in August 2003 and November 2003, the extent of soil contamination was determined by the installation of soil borings and OVA-FID screening of soil samples (TtNUS, 2004). During the first site mobilization (August 11 to 14, 2003), samples collected from 20 borings (SB-01 through SB-21, excluding SB-11) were screened. Four soil samples from these 20 borings produced net organic vapor readings exceeding 50 ppm: SB-14, 1 ft bls (405 ppm); SB-02, 1 ft bls (100 ppm); SB-20, 3 ft bls (80 ppm); and SB-12, 1 ft bls (76 ppm). During the second site

mobilization (November 25, 2003), samples from 10 additional soil borings (SB-22 through SB-31) were screened for organic vapors. Out of these ten soil samples, no measurements equal to or exceeding 50 ppm were recorded. OVA-FID results of soil screening are summarized in Table 2-1. A copy of the soil boring location map is included in Figure 3-3 (see Appendix A).

In addition to OVA-FID analysis, 19 soil samples were collected and analyzed in the field by an on-site mobile laboratory for benzene, toluene, ethylbenzene, and total xylenes (BTEX); methyl tertiary-butyl ether (MTBE); naphthalene; 1-methylnaphthalene; 2-methylnaphthalene; and TRPH during the Phase I assessment (August 11 to 15, 2003). Naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, and TRPH were the four most frequently detected compounds reported during the assessment. Table 2-2 summarizes the results for the soil sampling analytical results as presented in the SAR for the on-site mobile laboratory. These samples are illustrated in Figure 3-4 (see Appendix A).

Also during the Phase I assessment, additional soil samples were collected in general accordance with the Chapter 62-770.600, FAC, sampling method for fixed-base laboratory analysis of high, medium, and low sample concentrations. Samples collected at SB-14 (1 ft), SB-02 (1 ft), and SB-18 (3 ft) were submitted to the fixed-base laboratory for analysis as the high-, medium-, and low-range, respectively, based on the elevated mobile laboratory screening data and OVA-FID screening data. The samples were analyzed for VOCs, PAHs, and TRPH.

During the Phase II assessment (November 25, 2003), ten additional soil samples (SB-22 through SB-31) were collected at the site and submitted to a fixed-base laboratory for analysis of TRPH and PAHs. As a result of a laboratory exceedance at SB-29 (a TRPH value of 12,000 mg/kg), five additional soil samples were collected to delineate this sample point. The delineation of SB-29 occurred on May 11 and 12, 2004, and involved the collection of soil borings SB-32 through SB-36 which were also analyzed for TRPH and PAHs. A summary of the fixed-base soil samples is also provided in Table 2-3 and illustrated in Figure 3-5 (see Appendix A). The analytical results from the fixed-base laboratory were comparable to those reported by the mobile laboratory.

The results indicated that there are impacted soils at Site 250 exceeding FDEP target levels in affect at that time. Based on soil screening data and the fixed-base laboratory results, the contaminants appear to be smeared throughout the soil in the vadose zone.

**TABLE 2-1  
SOIL VAPOR HEADSPACE MEASUREMENTS  
FOCUSED REMEDIAL ACTION PLAN, SITE 250  
NAVAL STATION MAYPORT  
MAYPORT, FLORIDA**

Soil Boring Number	Date of Measurement	Sample Depth (ft bls)	Headspace Readings (ppm)		
			Unfiltered Reading	Carbon Filtered Reading	Net Reading
SB-01	8/11/2003	1	0	0	0
		3	0	0	0
SB-02	8/11/2003	1	116	16	<b>100*</b>
		3			Moist NS
SB-03	8/11/2003	1	0	0	0
		3	50	50	0
SB-04	8/11/2003	1	0	0	0
		3	0	0	0
SB-05	8/11/2003	1	0	0	0
		3	0	0	0
SB-06	8/11/2003	1	1	0	1
		3	0	0	0
SB-07	8/12/2003	1	0	0	0
		3	0	0	0
SB-08	8/12/2003	1	0	0	0
		3	0	0	0
SB-09	8/12/2003	1	0	0	0
		3			Moist NS
SB-10	8/12/2003	1	0	0	0
		3			Moist NS
SB-11	08/12/2003	1	0	0	0
		3			Moist NS
SB-12	8/12/2003	1	85	9	<b>76*</b>
		3			Moist NS
SB-13	8/12/2003	1	0	0	0
		3			Moist NS
SB-14	8/12/2003	1	411	6	<b>405*</b>
		3			Moist NS
SB-15	8/13/2003	1	0	0	0
		3			Moist NS
SB-16	8/14/2003	1	0	0	0
		3	0	0	0
SB-17	8/14/2003	1	0	0	0
		3	0	0	0
SB-18	8/14/2003	1	0	0	0
		3	0	0	0
SB-19	8/14/2003	1	0	0	0
		3	0	0	0
SB-20	8/14/2003	1	0	0	0
		3	85	5	<b>80</b>
SB-21	8/15/2003	1	0	0	0
		3	0	0	0

**Notes:**

Moist NS = Soil was too moist due to groundwater influence to collect an OVA sample.

\* = petroleum odor associated with sample

**TABLE 2-2**  
**MOBILE LABORATORY SOIL ANALYTICAL RESULTS**  
**FOCUSED REMEDIAL ACTION PLAN, SITE 250**  
**NAVAL STATION MAYPORT**  
**MAYPORT, FLORIDA**

Compound	FDEP SCTL (mg/kg)			Sample ID, Sample Date, and Sample Interval						
				SB-01	SB-02	SB-03	SB-04	SB-05	SB-06	SB-07
	Residential	Industrial	Leachability	8/11/2003	8/11/2003	8/11/2003	8/11/2003	8/11/2003	8/11/2003	8/12/2003
				3 ft	1 ft	3 ft	3 ft	3 ft	3 ft	1 ft
<b>Constituents (USEPA Method 8021B) (mg/kg)</b>										
Naphthalene	40	70	1.7	<.050	15	<.050	<.050	<.050	<.050	<.050
1-Methylnaphthalene	68	470	2.2	<.050	27	<.050	<.050	<.050	<.050	<.050
2-Methylnaphthalene	80	560	6.1	<.050	29	<.050	<.050	<.050	<.050	<.050
TRPH ( mg/kg)	340	2,500	340	ND	140	ND	ND	4.2	ND	ND

Compound	FDEP SCTL (mg/kg)			Sample ID, Sample Date, and Sample Interval						
				SB-08	SB-09	SB-10	SB-12	SB-13	SB-14	SB-15
	Residential	Industrial	Leachability	8/12/2003	8/12/2003	8/12/2003	8/12/2003	8/12/2003	8/12/2003	8/14/2003
				1 ft	1 ft	3 ft	1 ft	1 ft	1 ft	1 ft
<b>Constituents (USEPA Method 8021B) (mg/kg)</b>										
Naphthalene	40	70	1.7	<.050	<.050	<.050	<.050	<.050	<1.0	<.050
1-Methylnaphthalene	68	470	2.2	<.050	<.050	<.050	0.10	<.050	5.7	<.050
2-Methylnaphthalene	80	560	6.1	<.050	<.050	<.050	0.13	<.050	4.7	<.050
TRPH (mg/kg)	340	2,500	340	ND	ND	ND	5.3	ND	1300	ND

Compound	FDEP SCTL (mg/kg)			Sample ID, Sample Date, and Sample Interval				
				SB-16	SB-17	SB-18	SB-19	SB-20
	Residential	Industrial	Leachability	8/14/2003	8/14/2003	8/14/2003	8/14/2003	8/14/2003
				3 ft	3 ft	3 ft	3 ft	3 ft
<b>Constituents (USEPA Method 8021B) (mg/kg)</b>								
Naphthalene	40	70	1.7	<.050	<.050	<.050	<.050	<.050
1-Methylnaphthalene	68	470	2.2	<.050	<.050	0.080	<.050	0.41
2-Methylnaphthalene	80	560	6.1	<.050	<.050	<.050	<.050	0.066
TRPH (mg/kg)	340	2,500	340	ND	ND	11	ND	11

**Notes:**

< = less than

ND = No volatile TRPH peaks detected

USEPA = United States Environmental Protection Agency

**TABLE 2-3**  
**FIXED-BASE LABORATORY SOIL ANALYTICAL RESULTS**  
**FOCUSED REMEDIAL ACTION PLAN, SITE 250**  
**NAVAL STATION MAYPORT**  
**MAYPORT, FLORIDA**

Compound	FDEP SCTLs			Sample ID/Sample Date/Sample Depth							
	Direct Exposure Residential <sup>1</sup>	Leachability Based on Groundwater Criteria <sup>1</sup>	Industrial	MPT-250							
				SB-02	SB-14	SB-18	SB-22	SB-23	SB-24	SB-25	SB-26
				8/15/2003	8/15/2003	8/15/2003	11/25/2003	11/25/2003	11/25/2003	11/25/2003	11/25/2003
1 ft	1 ft	3 ft	1 ft	1 ft	1 ft	1 ft	1 ft				
<b>VOCs (USEPA Method 8021B) (mg/kg)</b>											
Toluene	380	0.5	2600	<110	<130	2.8	NA	NA	NA	NA	NA
<b>PAHs (USEPA Method 8270) (mg/kg)</b>											
Naphthalene	40	1.7	70	4.7	0.27	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
1-Methylnaphthalene	68	2.2	470	54	6.0	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
2-Methylnaphthalene	80	6.1	560	62	4.7	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Acenaphthylene	1,100	27	11,000	0.50	<0.35	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Acenaphthlene	1,900	2.1	18,000	1.5	<0.35	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Benzo(a)anthracene	1.4	5	3.2	<0.035	<0.35	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Benzo(b)fluoranthene	1.4	4.8	10	<0.035	<0.35	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Benzo(k)fluoranthene	15	52	25	<0.035	<0.35	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Benzo(a)pyrene	0.1	0.5	8	<0.035	<0.35	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Benzo(g,h,i)perylene	2,300	41,000	32,000	<0.035	<0.35	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Chrysene	140	450	77	<0.035	<0.035	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Indeno(1,2,3-cd)pyrene	1.5	5.3	28	<0.035	<0.35	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Fluorene	2,200	160	28,000	0.58	0.62	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Phenanthrene	2,000	250	30,000	0.071	1.0	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Anthracene	18,000	2,500	260,000	<0.035	0.20	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Fluoranthene	2,900	1,200	48,000	<0.035	0.073	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
Pyrene	2,200	880	37,000	<0.035	0.19	<0.036	<0.022	<0.021	<0.041	<0.021	<0.021
<b>FL-PRO (USEPA Method 8270) (mg/kg)</b>											
TRPH	340	340	2,500	8,100	4,000	71	1,100	130	75	270	26

See notes at end of table.

**TABLE 2-3 (CONTINUED)**  
**FIXED-BASE LABORATORY SOIL ANALYTICAL RESULTS**  
**FOCUSED REMEDIAL ACTION PLAN, SITE 250**  
**NAVAL STATION MAYPORT**  
**MAYPORT, FLORIDA**

Compound	FDEP SCTLs			Sample ID/Sample Date/Sample Depth							
	Direct Exposure Residential <sup>1</sup>	Leachability Based on Groundwater Criteria <sup>1</sup>	Industrial	MPT-250							
				SB-27	SB-28	SB-29	SB-30	SB-31	SB-32	SB-32	SB-33
				11/25/2003	11/25/2003	11/25/2003	11/25/2003	11/25/2003	5/11/04	5/11/04	5/11/04
1 ft	3 ft	3 ft	3 ft	3 ft	1 ft	3 ft	1 ft				
<b><u>VOCs (USEPA Method 8021B) (mg/kg)</u></b>											
Toluene	380	0.5	2600	NA	NA	NA	NA	NA	NA	NA	NA
<b><u>PAHs (USEPA Method 8270) (mg/kg)</u></b>											
Naphthalene	40	1.7	70	<0.021	<0.022	<2.2	<0.021	<0.021	<37	<37	<34
1-Methylnaphthalene	68	2.2	470	<0.021	<0.022	<2.2	<0.021	<0.021	<37	<37	<34
2-Methylnaphthalene	80	6.1	560	<0.021	<0.022	<2.2	<0.021	<0.021	<37	<37	<34
Acenaphthylene	1,100	27	11,000	<0.021	<0.022	<2.2	<0.021	<0.021	<37	<37	<34
Acenaphthlene	1,900	2.1	18,000	<0.021	<0.022	<2.2	<0.021	<0.021	<37	<37	<34
Benzo(a)anthracene	1.4	5	3.2	<0.021	<0.022	<2.2	<0.021	<0.021	<37	0.110	<34
Benzo(b)fluoranthene	1.4	4.8	10	<0.021	<0.022	<2.2	<0.021	<0.021	0.041	0.044	0.064
Benzo(k)fluoranthene	15	52	25	<0.021	<0.022	<2.2	<0.021	<0.021	<37	<37	<34
Benzo(a)pyrene	0.1	0.5	8	<0.021	<0.022	<2.2	<0.021	<0.021	<37	<37	0.040
Benzo(g,h,i)perylene	2,300	41,000	32,000	<0.021	<0.022	<2.2	<0.021	<0.021	<37	<37	<34
Chrysene	140	450	77	<0.021	<0.022	<2.2	<0.021	<0.021	<37	<37	0.037
Indeno(1,2,3-cd)pyrene	1.5	5.3	28	<0.021	<0.022	<2.2	<0.021	<0.021	<37	<37	<34
Fluorene	2,200	160	28,000	<0.021	<0.022	<2.2	<0.021	<0.021	<37	<37	<34
Phenanthrene	2,000	250	30,000	<0.021	<0.022	<2.2	<0.021	<0.021	<37	0.280	<34
Anthracene	18,000	2,500	260,000	<0.021	<0.022	<2.2	<0.021	<0.021	<37	<37	<34
Fluoranthene	2,900	1,200	48,000	<0.021	<0.022	<2.2	<0.021	<0.021	0.044	0.110	0.040
Pyrene	2,200	880	37,000	<0.021	<0.022	<2.2	<0.021	<0.021	<37	0.880	<34
<b><u>FL-PRO (USEPA Method 8270) (mg/kg)</u></b>											
TRPH	340	340	2,500	200	7.7 J	<b>12,000</b>	28	5.4 J	110	<b>7,300</b>	21

See notes at end of table.

**TABLE 2-3(CONTINUED)  
FIXED-BASE LABORATORY SOIL ANALYTICAL RESULTS**

**FOCUSED REMEDIAL ACTION PLAN, SITE 250  
NAVAL STATION MAYPORT  
MAYPORT, FLORIDA**

Compound	FDEP SCTLs			Sample ID/Sample Date/Sample Depth						
	Direct Exposure Residential <sup>1</sup>	Leachability Based on Groundwater Criteria <sup>1</sup>	Industrial	MPT-250						
				SB-33	SB-34	SB-34	SB-35	SB-35	SB-36	SB-36
				5/11/04	5/11/04	5/11/04	5/11/04	5/11/04	5/12/04	5/12/04
			3 ft	1 ft	2.5 ft	1 ft	3 ft	1 ft	3 ft	
<b><u>VOCs (USEPA Method 8021B) (mg/kg)</u></b>										
Toluene	380	0.5	2600	NA	NA	NA	NA	NA	NA	NA
<b><u>PAHs (USEPA Method 8270) (mg/kg)</u></b>										
Naphthalene	40	1.7	70	<35	<35	<41	<35	<36	<71	<73
1-Methylnaphthalene	68	2.2	470	<35	<35	<41	<35	<36	<71	<73
2-Methylnaphthalene	80	6.1	560	<35	<35	<41	<35	<36	<71	<73
Acenaphthylene	1,100	27	11,000	<35	<35	<41	<35	<36	<71	<73
Acenaphthlene	1,900	2.1	18,000	<35	<35	<41	<35	<36	<71	<73
Benzo(a)anthracene	1.4	5	3.2	<35	<35	<41	0.083	<36	0.091	<73
Benzo(b)fluoranthene	1.4	4.8	10	0.081	<35	<41	0.160	<36	0.18	<73
Benzo(k)fluoranthene	15	52	25	0.039	<35	<41	0.073	<36	<71	<73
Benzo(a)pyrene	0.1	0.5	8	<35	<35	<41	0.097	<36	0.081	<73
Benzo(g,h,i)perylene	2,300	41,000	32,000	0.05	<35	<41	0.110	<36	0.15	<73
Chrysene	140	450	77	0.056	<35	<41	0.110	<36	0.14	<73
Indeno(1,2,3-cd)pyrene	1.5	5.3	28	<35	<35	<41	<35	<36	0.1	<73
Fluorene	2,200	160	28,000	0.2	<35	<41	<35	<36	<71	<73
Phenanthrene	2,000	250	30,000	<35	<35	<41	<35	<36	<71	<73
Anthracene	18,000	2,500	260,000	<35	<35	<41	<35	<36	<71	<73
Fluoranthene	2,900	1,200	48,000	<35	<35	<41	0.140	<36	0.1	<73
Pyrene	2,200	880	37,000	0.17	<35	<41	0.097	<36	0.11	<73
<b><u>FL-PRO (USEPA Method 8270) (mg/kg)</u></b>										
TRPH	340	340	2,500	48	7.7	<8	32	<7.1	46	100

**Notes:**

<sup>1</sup>Chapter 62-770, FAC (April 30, 1999)

The quality control for this data has only been checked by the laboratory.

**Bold** = values in excess of SCTLs, Chapter 62-770, FAC (April 30, 1999)

NA = not analyzed

J = estimated value

FL-PRO = Florida Petroleum Range Organics

## 2.3 GROUNDWATER ASSESSMENT

The vertical and horizontal extent of petroleum impacted groundwater in the surficial aquifer was assessed via DPT and monitoring well sampling as described in the SAR (TtNUS, 2004).

During the Phase I assessment, groundwater samples were collected at each of the soil boring locations and analyzed for BTEX, MTBE, naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, and TRPH. Concentrations exceeding FDEP GCTLs were reported in 5 of 15 shallow samples analyzed (SB-01, SB-02, SB-04, SB-18, and SB-20). The highest concentrations were identified in the sample collected from SB-02, a location where elevated soil vapor readings and FDEP SCTL exceedances in laboratory-analyzed soil samples had previously been reported. No exceedances were reported in the vertical profile samples collected at SB-11 from depths of 20 ft, 30 ft, and 40 ft bls. A summary of the mobile laboratory analytical results on these samples is listed in Table 2-4. These samples are illustrated in Figure 3-6 (see Appendix A).

After the Phase I (DPT) investigation was completed, five shallow monitoring wells (screened 3 to 13 ft bls) and one deep monitoring well (screened 35 to 40 ft bls) were installed at locations considered optimum based upon results of the preliminary assessment. Permanent monitoring wells MW-01 and MW-06D were installed at the location containing the highest levels of contamination (SB-02). MW-02 and MW-04 were installed for cross-gradient control to the south. MW-03 was installed as a downgradient well and MW-05 as an upgradient well.

No concentrations exceeding FDEP GCTLs were reported in the Gasoline Analytical Group (GAG)/Kerosene Analytical Group (KAG) analyses of groundwater samples collected from the six wells. The groundwater analytical results are summarized in Table 2-5 and illustrated in Figure 3-7 (see Appendix A). The analytical results indicate that samples from the shallow source area well (MW-01) contained the four frequently recurring compounds, but at trace concentrations. TRPH was also identified at a low concentration in MW-02, the southwestern (cross-gradient) control well. Low concentrations of compounds not previously reported were detected at the vertical profile well, MW-06D, less than FDEP GCTLs.

A second round of groundwater sampling was performed on November 24, 2003. A summary of detected compounds from the second event is also provided in Table 2-5 and illustrated in Figure 3-7 (see Appendix A). Analytical data reported during this second event were similar to those reported in the first event. No GCTL exceedances were reported and concentrations of individual constituents were similar in both laboratory reports.

**TABLE 2-4**  
**MOBILE LABORATORY GROUNDWATER ANALYTICAL RESULTS**  
**FOCUSED REMEDIAL ACTION PLAN, SITE 250**  
**NAVAL STATION MAYPORT**  
**MAYPORT, FLORIDA**

Compound	FDEP GCTLs <sup>1</sup>	Sample ID and Sample Date								
		SB-01	SB-02	SB-03	SB-04	SB-05	SB-06	SB-07	SB-08	SB-09
		8/11/2003	8/11/2003	8/11/2003	8/11/2003	8/11/2003	8/11/2003	8/12/2003	8/12/2003	8/12/2003
<b>Constituents (USEPA Method 8021B) (µg/L)</b>										
Naphthalene	20	<b>61.4</b>	<b>100</b>	<5.0	<50	<5.0	<5.0	<5.0	<5.0	<5.0
1-Methylnaphthalene	20	<b>118</b>	<b>600</b>	14.5	<b>88</b>	<5.0	<5.0	<5.0	<5.0	<5.0
2-Methylnaphthalene	20	<b>105</b>	<b>690</b>	13.3	<b>82</b>	<5.0	<5.0	<5.0	<5.0	<5.0
TRPH ( mg/L)	5	3.2	<b>51</b>	0.78	<b>11</b>	0.44	ND	ND	ND	ND

Compound	FDEP GCTLs <sup>1</sup>	Sample ID and Sample Date								
		SB-10	SB-11 20'	SB-11 30'	SB-11 40'	SB-16	SB-17	SB-18	SB-19	SB-20
		8/12/2003	8/12/2003	8/12/2003	8/12/2003	8/14/2003	8/14/2003	8/14/2003	8/14/2003	8/14/2003
<b>Constituents (USEPA Method 8021B) (µg/L)</b>										
Naphthalene	20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1-Methylnaphthalene	20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<b>89.5</b>	<5.0	<b>47.3</b>
2-Methylnaphthalene	20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<b>36</b>	<5.0	<b>22</b>
TRPH (mg/L)	5	ND	0.54	0.68	0.56	ND	ND	<b>8.2</b>	0.58	1.8

**Notes:**

<sup>1</sup>Chapter 62-770, FAC (April 30, 1999)

**Bolded** values exceed FDEP target levels.

ND = No volatile TRPH peaks detected

mg/L = milligrams per liter

**TABLE 2-5**  
**FIXED-BASE LABORATORY GROUNDWATER ANALYTICAL RESULTS**  
**FOCUSED REMEDIAL ACTION PLAN, SITE 250**  
**NAVAL STATION MAYPORT**  
**MAYPORT, FLORIDA**

Compound	FDEP GCTL <sup>1</sup>	Sample ID and Date											
		MW-01		MW-02		MW-03		MW-04		MW-05		MW-06D	
		9/23/03	11/24/03	9/23/03	11/24/03	10/7/03	11/24/03	9/23/03	11/24/03	9/23/03	11/24/03	9/23/03	11/24/03
<b>VOCs (USEPA Method 8260) (µg/L)</b>													
MTBE	50	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	2.4	NA
1,1-DCA	70	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	2	NA
c-1,2-DCE	70	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	<1.0	NA	1.3	NA
<b>PAHs (USEPA Method 8310) (µg/L)</b>													
Naphthalene	20	0.23	0.13 J	<0.10	<0.20	<0.10	NS	<0.10	<0.20	<0.10	<0.20	<0.10	<0.20
1-Methylnaphthalene	20	1.3	0.9	<0.10	<0.20	<0.10	NS	<0.10	<0.20	<0.10	<0.20	<0.10	<0.20
2-Methylnaphthalene	20	1.1	0.84	<0.10	<0.20	<0.10	NS	<0.10	<0.20	<0.10	<0.20	<0.10	<0.20
Acenaphthene	20	<0.10	<0.20	<0.10	<0.20	0.14	NS	<0.10	<0.20	<0.10	<0.20	<0.10	<0.20
<b>FL-PRO (USEPA Method 8270) (mg/L)</b>													
TRPH	5	0.5	0.31 J	0.22	0.38 J	1.3	NS	<0.20	0.43 J	<0.20	<0.50	<0.50	0.56
<b>Total Lead (Method 200.7 mg/L)</b>													
	15	<0.010	NA	<0.010	NA	<0.010	NA	<0.010	NA	<0.010	NA	<0.010	NA

**Notes:**

<sup>1</sup>Chapter 62-770, FAC (April 30, 1999)

Wells were installed on August 7, 2001.

NA = not analyzed

J = estimated value

NS = not sampled

## 2.4 STATISTICAL MODEL OF SOIL CONTAMINATION

During the March 2004 MPT meeting in Jacksonville, Florida, it was proposed that a statistical analysis be performed to determine if the site as a whole posed unacceptable human health risks related to constituents of concern (COCs) in soils. The primary reason for this decision was that a portion of the impacted soils identified are near a storm sewer, which may be a source of the contaminants. FDEP's approved software (FLUCL [Florida UCL]) was used as the statistical tool for determining the risk posed by Site 250 at the 95% UCL.

Data used in the statistical model included both mobile and fixed-base laboratory results. Since replicate data was available for some of the samples, calculations were made using both average values and the highest value detected for replicate samples. Copies of the model output for each parameter using both average and high replicate values are provided in Appendix F (copied from the SAR [TtNUS, 2004]).

Statistical analysis was performed using two scenarios to calculate the risk posed by the site at the 95% UCL in the SAR (TtNUS, 2004). Scenario one included using the available data for Site 250 collected during the SA to evaluate the risks posed by the site in its current condition, and scenario two included the evaluation of the data after the removal of impacted soils in the source area at Site 250. Each scenario was run using average and high concentration results.

Model results for scenario one (current site conditions) using average concentration values indicates the 95% UCL exceeds the following SCTL values: leachability (1-methylnaphthalene, 2-methylnaphthalene, and TRPH) and residential exposure (TRPH). Model results for the 95% UCL value using the highest detected concentrations indicate the 95% UCL exceeds the following SCTL values: leachability (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, TRPH), residential (TRPH), and industrial (TRPH). Model results are provided in Table 2-6.

In order to evaluate potential source removal scenarios, alternative models were run on the data set. The alternative models considered the removal of soil contamination found in the source area represented by soil borings SB-20, SB-29, SB-30 and SB-32. Removal of these data points from the data set simulates the risk posed by the site after source removal. The 95% UCL calculations in this scenario were developed using average TRPH concentrations and highest concentrations as previously described. The results of the model indicate that 95% UCL values exceed the following SCTLs using average concentrations; leachability (1-methylnaphthalene, 2-methylnaphthalene, and TRPH) and residential (TRPH). Model results for the 95% UCL value using the highest concentrations indicate the 95% UCL exceeds the following SCTL values: leachability (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, and TRPH) and residential (TRPH). The 95% UCL value to evaluate risk for this data set determined that the site risk is reduced to less than the FDEP SCTLs for direct industrial exposure via removal of SB-20,

**TABLE 2-6**  
**STATISTICAL METHODS USED TO ACHIEVE 95% UCL**  
**FOCUSED REMEDIAL ACTION PLAN, SITE 250**  
**NAVAL STATION MAYPORT**  
**MAYPORT, FLORIDA**

Chemical of Concern	FDEP SCTLs (mg/kg)			95% UCL Value <sup>1</sup>			
	Residential	Industrial	Leachability	Average Values	Average Values Minus Excavated Source Area <sup>2</sup>	High Values	High Values Minus Excavated Source Area <sup>2</sup>
Naphthalene	40	70	1.7	1.43	1.60	2.15	2.43
1-Methylnaphthalene	68	470	2.2	5.83	6.62	7.68	8.74
2-Methylnaphthalene	80	560	6.1	6.48	7.36	8.74	9.95
TRPH (mg/kg)	340	2500	340	2337	887	2659	1434

**Notes:**

<sup>1</sup> = The 95 percentile upper confidence level value was calculated using FDEP's FLUCL software.

<sup>2</sup> = The Planned Excavated Area contains soil borings SB-20, SB-29, SB-30, and SB-32.

SB-29, SB-30 and SB-32. Therefore, no exceedances of FDEP SCTLs for industrial direct exposure result using this excavation scenario. Model results are provided in Table 2-6.

Additional model runs were conducted in an attempt to determine if excavation could be conducted to reduce site risk to less than residential and/or leachability scenarios. It was found that this could only be accomplished via removal of soils adjacent to or beneath the storm sewer line. As a result, the Navy decided to pursue closure and Risk Management Option Level II (Chapter 62-770, FAC) to remove source area soils to reduce risks to levels less than FDEP SCTLs for industrial direct exposure and to establish ICs to prevent future development of the site for residential purposes.

## **2.5 SAR CONCLUSIONS AND RECOMMENDATIONS**

In the SAR, TtNUS recommended that the source area soils be excavated, a soil excavation report be completed, and post-excavation quarterly monitoring be completed. Since impacted soil adjacent to the storm sewer shall be left in place, an IC should be placed on this area restricting future development to non-residential purposes.

The SAR concluded that petroleum constituents have impacted soils at Site 250 as a result of past fuel storage. The potential source area at the site is a grass-covered area where one 12,500-gallon waste oil UST and two 10,000-gallon ASTs were removed. "Excessively contaminated soil" was present in four soil samples (SB-02, 1 ft bls; SB-12, 1 ft bls; SB-14, 1 ft bls; and SB-20, 3 ft bls) collected at the site. Three of the four samples were located approximately 50 ft west or southwest of the potential source area and the fourth was located approximately 15 ft southwest of the former waste oil UST location. Naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, and TRPH were the four most frequently recurring compounds in laboratory analyses throughout the SA.

FLUCL statistical analysis was performed using mobile and fixed-base laboratory soil analytical data for the purpose of evaluating the risk posed by the site. The results of these calculations indicate that a 95% UCL value less than industrial SCTLs for each constituent can be achieved through the removal of soil surrounding and including the elevated TRPH soil identified at SB-20, SB-29, SB-30, and SB-32. The soil surrounding these sample points has been pre-characterized for excavation purposes to less than FDEP SCTLs for industrial direct exposure. The proposed excavation shall involve the removal of approximately 100 yd<sup>3</sup> of soil.

No groundwater exceedances were confirmed. Once the impacted soil is excavated and transported to an off-site disposal facility, groundwater at the site will be monitored for a minimum of one year. The first event should be conducted immediately after construction/backfilling. This event shall be considered the

first of four quarterly sampling events. The subsequent events shall be conducted once per quarter until four events are completed.

### **3.0 REMEDIAL ACTION PLAN GOALS**

The objective of this Focused RAP is to present a technology relevant and cost-effective to:

- Reduce the petroleum-impacted soil at the site.
- Protect human health and the environment by reducing the concentrations of petroleum hydrocarbons detected at the site to target cleanup levels.

The goals and expected accomplishments of this Focused RAP include the following:

- Evaluate the NAVSTA MPT recommended treatment option, soil excavation, for petroleum-impacted soil at Site 250.
- Provide a conceptual design for soil excavation at Site 250.
- Specify a groundwater monitoring plan to track the post-excavation remediation status of Site 250.
- Establish the requirements of ICs at Site 250.

The target cleanup concentrations for the soil and groundwater at the subject site are based on analytes detected in the soil and groundwater in exceedance of Chapter 62-777, FAC, April 2005. The following subsections list the target levels for the site-specific COCs.

#### **3.1 SOIL TARGET LEVELS**

Based on the selected SCTLs listed in Table II of Chapter 62-777, FAC, April 2005, Table 3-1 presents the soil remediation goals for the site-specific COCs. Site-specific soil COCs were defined as any constituent exceeding residential direct exposure or leachability criteria for FDEP SCTLs.

#### **3.2 GROUNDWATER TARGET LEVELS**

Since groundwater was not shown to be impacted above GCTLs, groundwater remediation goals are not appropriate. Post-excavation groundwater monitoring will be necessary in general accordance with Chapter 62-770, FAC.

**TABLE 3-1  
COCs AND ASSOCIATED SCTLs**

**FOCUSED REMEDIAL ACTION PLAN, SITE 250  
NAVAL STATION MAYPORT  
MAYPORT, FLORIDA**

<b>Site-Specific COCs</b>	<b>Concentrations from Table II*</b>
Naphthalene	1.2 mg/kg
1-Methylnaphthalene	3.1 mg/kg
2-Methylnaphthalene	8.5 mg/kg
TRPH	340 mg/kg

\* Concentration is the lower of the residential direct exposure or leachability based on groundwater criteria Table II, Chapter 62-777, FAC, April 2005.

## **4.0 CONTAMINANT DISTRIBUTION**

### **4.1 ESTIMATED MASS OF CONTAMINANTS IN SOIL**

Soil investigations identified and characterized an area of impacted soil at a depth of 1 ft and 3 ft bls near the former ASTs and UST. Soil contamination was defined within the “smear zone” from land surface to the water table (at an average depth of 3 ft bls). Two analysis methods (OVA and fixed-base laboratory analysis) were used to determine the presence of impacted soil.

Per the SAR and MPT discussions, four soil samples (SB-20, SB-29, SB-30, and SB-32) in the area of the former storage tanks require remediation to reduce the 95% UCL of the average values for the data set to less than the soil clean-up criteria shown in Table 3-1. Soil borings surrounding these sample locations were analyzed for TRPH and PAHs and were found to be equal to or less than FDEP SCTLs for residential direct exposure. As a result, the extent of the impacted area was defined. It was requested by the NAVSTA MPT that the area of remediation extend to soils that are “clean” and are less than the FDEP SCTLs for residential direct exposure to ensure complete removal of impacted soils above industrial SCTLs in the vicinity of SB-20, SB-29, SB-30, and SB-32.

The volume of soil contained in the impacted (SB-20, SB-29, SB-30, and SB-32) area to a depth of 3 ft is approximately 70 yd<sup>3</sup>. As shown in Table 4-1, a conservative estimate of 100 yd<sup>3</sup> of soil requiring remediation was derived due to a fluctuating groundwater table.

### **4.2 ESTIMATED MASS OF CONTAMINANTS IN GROUNDWATER**

Groundwater samples were taken from monitoring wells installed in documented soil impacted areas and areas where screening level data indicated potential exceedances of FDEP GCTLs. No groundwater exceedances were confirmed. Since the laboratory analytical data concluded there is no groundwater contamination to be addressed at Site 250, no area or volume calculations were performed.

**TABLE 4-1  
WATER TABLE ELEVATION DATA  
FOCUSED REMEDIAL ACTION PLAN, SITE 250  
NAVAL STATION MAYPORT  
MAYPORT, FLORIDA**

Well ID Number MPT-250-	Total Well Depth (ft)	TOC Elevation (ft msl)	October 29, 2003		November 26, 2003	
			Depth to Water Below TOC (ft)	Water Table Elevation (ft msl)	Depth to Water Below TOC (ft)	Water Table Elevation (ft msl)
MW-01	12.1	6.43	3.53	2.90	3.99	2.44
MW-02	13	6.43	3.47	2.96	4.00	2.43
MW-03	13.2	7.27*	4.59	2.68	5.07	2.20
MW-04	13	7.27	4.32	2.95	5.00	2.27
MW-05	12.2	5.99	3.05	2.94	3.46	2.53
MW-06D	40	6.38	3.42	2.96	3.57	2.81

**Notes:**

Determined from TtNUS Survey, November 26, 2003.  
MSL = mean sea level  
TOC = top of casing

## **5.0 REMEDIAL TREATMENT OPTION**

Through statistical analysis it was determined that the 95% UCL value representing the soil data set could be reduced to less than FDEP SCTLs for direct industrial exposure via removal of soils in the vicinity of the former tank hold. Using this information, the NAVSTA MPT determined that the site closure strategy for Site 250 would include the removal of source area soils. Additionally, the MPT agreed to implement ICs to prevent future development of the site for residential purposes. The team also agreed on the preparation of this Focused RAP that includes soil excavation and the implementation of ICs as the only remedy evaluated. Therefore, additional remedial treatment alternatives were not evaluated and compared in this Focused RAP. TtNUS conducted an evaluation of the recommended treatment option to address impacted soils at Site 250. The selected option was evaluated based on ability to meet clean-up objectives (effectiveness), applicability based on site conditions, feasibility of implementation, and reliability.

### **5.1 SUMMARY OF RECOMMENDED SOIL TREATMENT OPTION**

Based on the previous assessment data, a total volume of approximately 100 yd<sup>3</sup> of soil is estimated to be remediated. TtNUS has evaluated excavation to remove source area soils and the implementation of ICs to prevent future development of the site for residential purposes per direction from the NAVSTA MPT.

The recommended treatment option consists of the physical removal and off-site disposal of soils impacted with petroleum hydrocarbon constituents exceeding the cleanup target levels. The excavation of the impacted soil should extend from land surface to the top of the water table, which was 3 ft to 3.5 ft bls during the time of this investigation, and is estimated at approximately 100 yd<sup>3</sup>.

Excavation offers the complete and immediate removal of contaminants from the site over a short duration. Soil removal operations can be accomplished using standard equipment. The excavated soil will be transported to an off-site permitted disposal facility for disposal. The soil has been pre-characterized, so no delays are anticipated. The excavation will be backfilled with clean material comparable to the material that is removed from Site 250. Following backfill activities, quarterly post-excavation groundwater monitoring will commence.

## **5.2 COST AND SCHEDULE FOR RECOMMENDED TREATMENT OPTION**

Scheduling for work to be performed at Site 250 has already been undertaken by NAVFAC EFD SOUTH and the subcontractor. The estimated cost for soil excavation, transportation, off-site treatment/disposal, site restoration, and quarterly groundwater monitoring for one year is approximately \$142,800. More detailed cost information is presented in Table G1 in Appendix G.

## 6.0 SOURCE REMOVAL PLAN

The evaluated treatment option for impacted soils at Site 250 is excavation to remove source area soils to reduce the 95% UCL for the data set, the implementation of ICs to prevent future development of the site for residential purposes, and post-excavation quarterly groundwater monitoring.

### 6.1 EXCAVATION AND DISPOSAL DETAILS

Major components of soil excavation plan include the following:

- Pre-excavation activities
- Excavation
- Off-site Disposal
- Backfill and compaction
- Site restoration and/or grading
- Post-excavation groundwater monitoring

Seven soil borings (SB-28, SB-30, SB-31, SB-33, SB-34, SB-35, and SB-36) form the soil excavation boundaries and coordinates of these seven points are provided in Table 6-1 and illustrated in Figure 6-1 (see Appendix A). The excavation boundary coordinates will provide direction to a contractor to locate the soil pre-characterization sample points, forming the excavation boundary.

The excavation of the impacted soil should extend to the water table, which was 3 ft to 3.5 ft bls during the time of this investigation. Groundwater in nearby wells was approximately 3 ft bls. At an excavation depth of 3 ft, approximately 70 yd<sup>3</sup> of compacted soil would be excavated. Due to a fluctuating groundwater table, a conservative estimate of 100 yd<sup>3</sup> of soil to be excavated was derived.

**TABLE 6-1  
EXCAVATION COORDINATES  
FOCUSED REMEDIAL ACTION PLAN, SITE 250  
NAVAL STATION MAYPORT  
MAYPORT, FLORIDA**

<b>Boring Number</b>	<b>Northing<sup>1</sup></b>	<b>Easting<sup>1</sup></b>	<b>Latitude</b>	<b>Longitude</b>
SB-20	2201704.1863	526595.1116	30°23'21.09	81°24'39.43
SB-28	2201698.4977	526583.2793	30°23'21.03	81°24'39.56
SB-29	2201712.6236	526591.3183	30°23'21.17	81°24'39.47
SB-30	2201708.8473	526604.8816	30°23'21.13	81°24'39.32
SB-31	2201695.2513	526599.4846	30°23'21.00	81°24'39.38
SB-32	2201717.5116	526600.3863	30°23'21.22	81°24'39.37
SB-33	2201722.4032	526587.0760	30°23'21.27	81°24'39.52
SB-34	2201708.1047	526582.2629	30°23'21.13	81°24'39.58
SB-35	2201721.9004	526610.1494	30°23'21.26	81°24'39.26
SB-36	2201729.7404	526596.5998	30°23'21.34	81°24'39.41

**Notes:**

<sup>1</sup> The State Plane coordinates shown hereon are based on Florida State Plane, East Zone, 1983/1990 Datum, US Survey Feet, and were established by GPS measurements.

**6.2 PRE-EXCAVATION ACTIVITIES**

Prior to the excavation, the following information, reports, and communications will be completed by the subcontractor:

- The contractor shall oversee all aspects of work-site health and safety throughout the project. A Health and Safety Plan (HASP) documenting all site operations conducted at NAVSTA Mayport shall be developed and kept on-site at all times. The HASP must comply with requirements stipulated in the Occupational Safety and Health Administration Standard 29 Code of Federal Regulations 1910.120. The site-specific HASP must be approved by the following NAVFAC EFD SOUTH and the NAVSTA Mayport Environmental Department personnel and submitted no later than 30 days prior to beginning work:

Ms. Beverly Washington  
Remedial Project Manager  
NAVFAC EFD SOUTH  
PO Box 190010  
North Charleston, SC 29419-9010

Mr. Scott Dombrosky  
Environmental Department  
Code 320, Navy PWC Jacksonville  
Naval Air Station Jacksonville  
Jacksonville, FL

- An active garage maintained by PWC is located on site. It is the contractor's responsibility to notify PWC (phone number 904-542-3558, extension 4322) two weeks in advance of the beginning of the excavation work. It is common practice that PWC stores material or equipment near the area of the excavation. It is also the contractor's responsibility to communicate with PWC to move all stored materials to a safe distance from the excavation site. The PWC contact name(s) and time(s) of the conversation should be documented by the subcontractor. If PWC is not notified, the work to be performed by the subcontractor may be slowed or stopped do to operations ongoing at the garage.
- Survey coordinates have been provided in Table 6-1. The contractor shall conduct a site survey to identify and flag the surveyed coordinates that designate the limits of the excavation.
- Prior to beginning the excavation, a Dig Permit shall be obtained from the Public Works Engineering Division located at Building 1966 (on base). This permit process should be initiated no later than three weeks prior to beginning work. The dig permit requires the signatures of multiple personnel and multiple parties. Once the permit is obtained, it is required to remain on-site throughout the project. If utilities are found to be inside the excavation, hand digging will be used to remove soils within 3 ft of the located utility. No active utilities are anticipated to be within the excavation area.
- The contractor shall provide written documentation detailing which waste disposal facility and any subcontractors to be used. The soil shall be taken to a licensed disposal facility.

### **6.3 EXCAVATION ACTIVITIES**

All excavation procedures including site control, posting of signs, and cones shall be adhered to and carried out according to the HASP and the Work Plan. The extent of the excavation has been defined using surveyed coordinates. A copy of the coordinates documenting the sample boring locations is presented in Table 6-1.

- The contractor shall be responsible for maintaining the schedule and documentation of all activities including the excavation. A daily log should include, but is not limited to, work performed, subcontractors, personnel, equipment, site conditions, and all health and safety related matters. Copies of the daily activities log shall be provided to the Navy upon completion of the project.

- The excavation of the impacted soil shall extend to the top of the surficial water table. If the top of the surficial water table is less than 3 ft bls at the time of the excavation, the soil shall be removed to a minimum of 3 ft bls. At a depth of 3 ft bls, 70 yd<sup>3</sup> of compacted soil would be removed. It is estimated that up to 100 yd<sup>3</sup> of soil may be removed.
- The excavated soils may be stockpiled and covered with heavy-duty polyethylene sheeting at the site. This shall be done in a manner to avoid the potential for contaminating surrounding soil and surface water. Alternately, soil may be stockpiled in properly lined and covered roll-off containers or drums or directly loaded onto trucks for transportation to the approved disposal facility.
- No post-excavation soil sampling will be required. The extent of the excavation has been pre-determined.

#### **6.4 BACKFILL/SITE RESTORATION**

The site shall be backfilled with material comparable to what was removed. The backfill shall be void of vegetation and manmade materials. If such materials are found to be in the backfill, the undesirable backfill shall be removed and replaced at the subcontractor's expense. All fill material used shall be obtained from an uncontaminated source. The materials will be certified as clean or tested by the excavation contractor to ensure the material is suitable for use as backfill prior to being brought to the site. The soil shall be tamped or tracked in with equipment to assist with compaction. Lime rock that currently covers the site will be restored. A minimum of 6 inches of lime rock is required to cover the excavation area. Compaction of the lime rock should be completed with a smooth-drum roller or similar device.

#### **6.5 DISPOSAL**

The soils shall be properly disposed of based on waste characterization activities. A soil sample for disposal characterization was collected and analyzed for TRPH using the FL-PRO Method, PAHs using USEPA Method 8270, VOCs using USEPA Method 8260, and metals (arsenic, cadmium, chromium and lead) using USEPA Method 6010. Laboratory analysis of soil samples for disposal purposes has been conducted and can be provided upon request. The impacted soil shall not remain on site longer than two days after its excavation and will be manifested for disposal at a permitted disposal facility.

#### **6.6 DOCUMENTATION**

Once the excavation is complete, the subcontractor shall prepare a Source Removal Report documenting all remedial action activities. The report shall contain all elements required by the FDEP to obtain site

closure including date, time, description of work completed, photographs, figures, tables, groundwater analytical results, soil disposal manifests, and clean fill certification. The report shall also indicate the ICs to be implemented at the site. The report shall be submitted to Ms. Beverly Washington, Remedial Project Manager, NAVFAC EFD SOUTH, and Mr. Scott Dombrosky, PWC Environmental Director, in draft form for approval.

## **6.7 GROUNDWATER MONITORING**

Once the excavation is completed and the FDEP has approved the excavation report, the monitoring phase of work can begin. The monitoring plan included in the report shall be limited to four quarters. The wells included as part of the plan shall be MW-2, MW-3, and MW-4. The positions of the wells in relation to the soil impact are cross gradient and downgradient, and each well sample should be analyzed for the GAG/KAG analytical group as outlined in Chapter 62-770, FAC. The first event should be conducted immediately after construction/backfilling. This event shall be considered the first of four quarterly sampling events. The subsequent events shall be conducted once per quarter until four events are completed.

Upon the completion of each report, the report will be submitted to the Navy and PWC in draft form. Following Navy approval, a letter will be issued to FDEP. If no constituents are detected after two successive monitoring events, the contractor shall recommend no further action and obtain FDEP concurrence prior to the next monitoring event. If constituents are detected but remain less than GCTL values, the contractor shall recommend no further action after four quarters of monitoring.

## REFERENCES

FDEP (Florida Department of Environmental Protection), 1997. Florida Administrative Code, Petroleum Contamination Site Cleanup Site Criteria, Chapter 62-770. September.

Mullens, M., and Rogers, T., 1993. *AIECHE/DIPPR Environmental Safety, and Health Data, Design Institute for Physical Property Research* – Research Project 911, American Institute for Chemical Engineers. June.

R. S. Means, 2005. *Environmental Remediation Cost Data – Unit Price*, 11<sup>th</sup> Annual Edition, Azimuth Group, Ltd. And ECHOS, L.L.C.

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TtNUS, 2003. *Remedial Action Plan for Underground Storage Tank Site 20*, Naval Air Station Pensacola, Pensacola, Florida.

TtNUS, 1999. *Remedial Action Plan for Former Fire Fighting Training Facility*, Naval Air Station Jacksonville, Jacksonville, Florida.

USEPA 1995. *How to Evaluate Alternative Cleanup Technologies for Underground Storage Tank Sites, A Guide For Corrective Action Plan Reviewers*, USEPA 510-B-95-007. May.

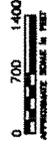
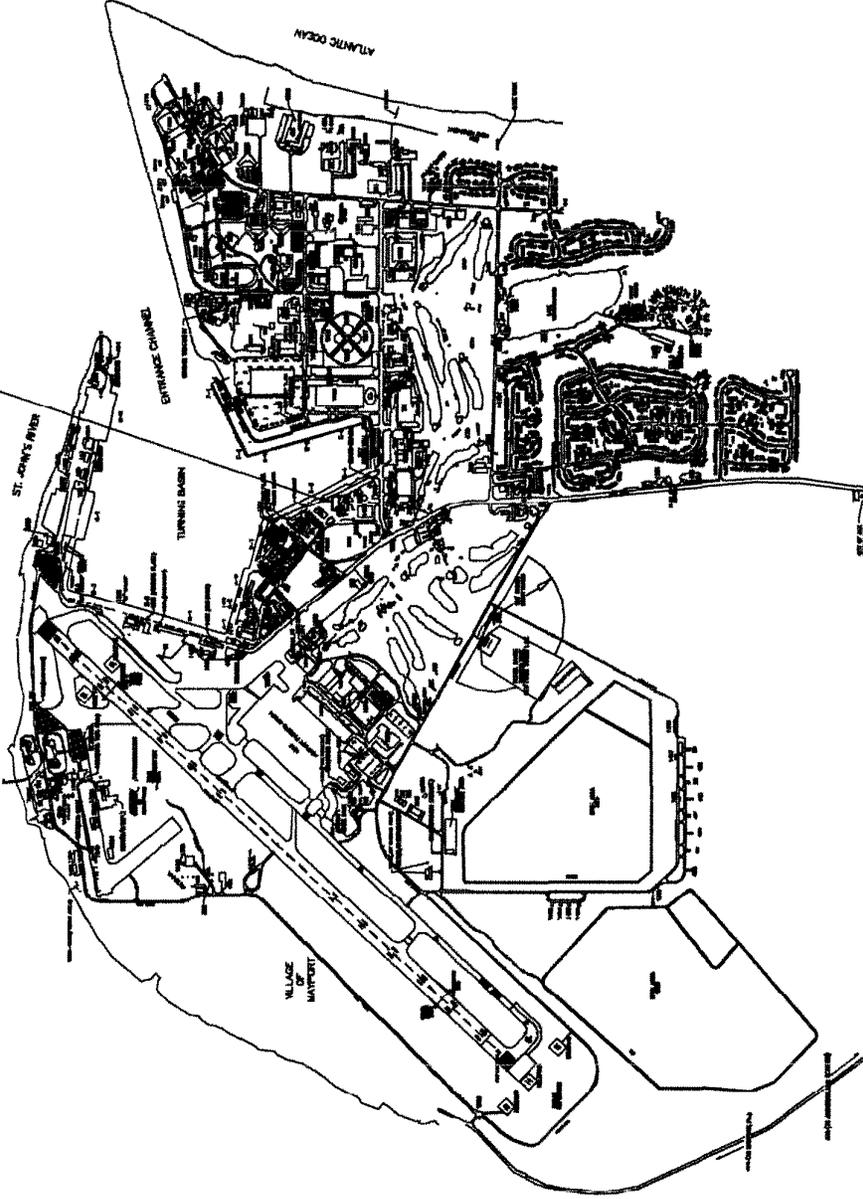
**APPENDIX A**

**SAR FIGURES**



MAYPORT AND CROSSKEYS 250 DATA SUMMARY

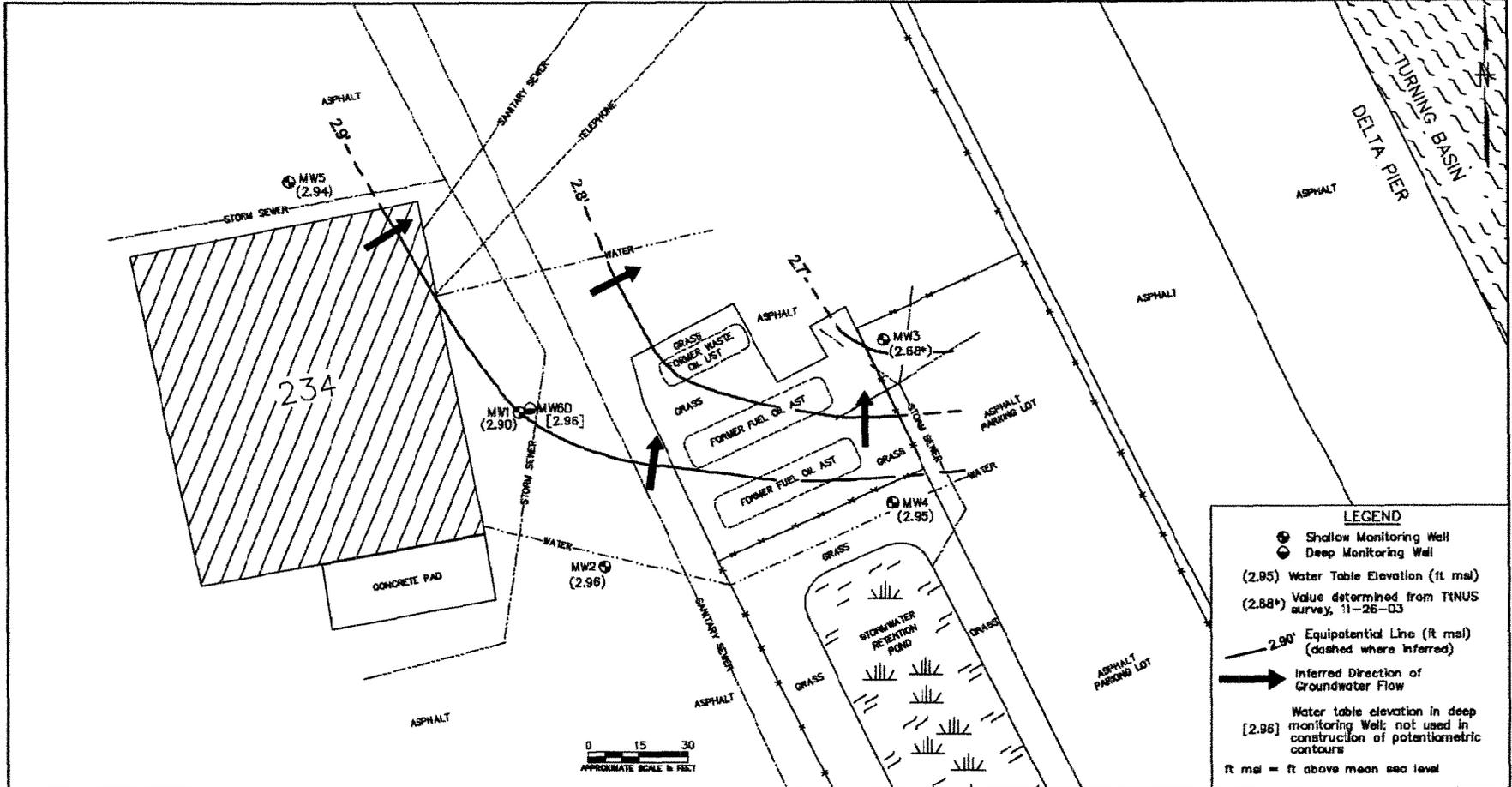
SITE 250



NO. DATE		REVISIONS	BY	CHG	APPD	REFERENCES			CONTRACT NO. 58663 APPROVED BY _____ DATE _____ APPROVED BY _____ DATE _____ DRAWING NO. FIGURE 1-2 REV. 0	
							DRAWN BY J.L.K. DATE 10/20/03 CHECKED BY _____ DATE _____ COST/SCHED.-AREA _____ SCALE _____ AS NOTED		SITE LOCATION MAP SITE 250 SITE ASSESSMENT REPORT NAVAL STATION MAYPORT MAYPORT, FLORIDA	



MAPPORT 08\CTO303\2003\CH01\588303.DWG



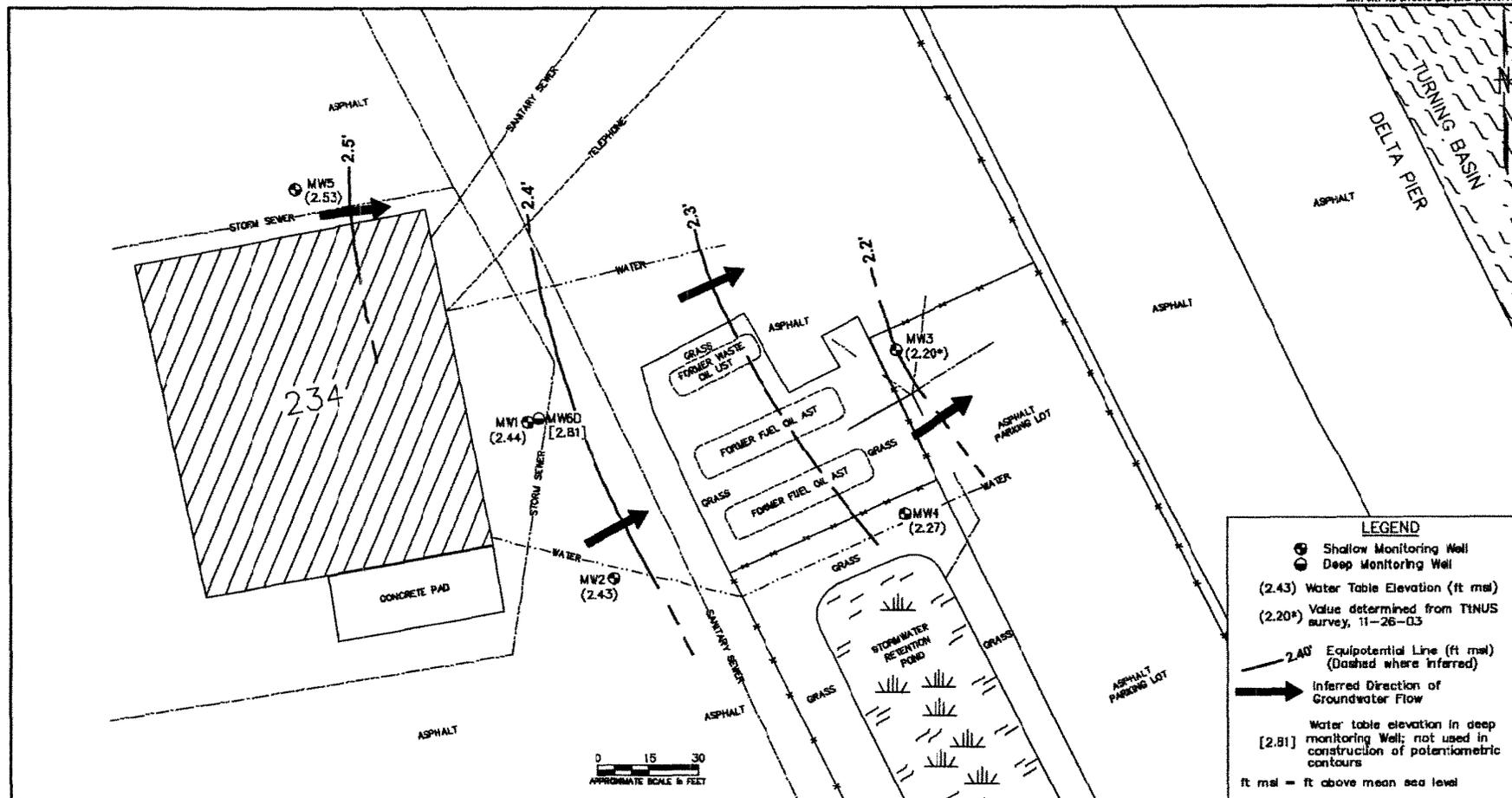
**LEGEND**

- Shallow Monitoring Well
- ⊙ Deep Monitoring Well
- (2.95) Water Table Elevation (ft msl)
- (2.88\*) Value determined from TINUS survey, 11-26-03
- - - 2.90 Equipotential Line (ft msl) (dashed where inferred)
- Inferred Direction of Groundwater Flow
- [2.96] Water table elevation in deep monitoring Well; not used in construction of potentiometric contours
- ft msl = ft above mean sea level

NO.	DATE	REVISION	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE		GROUNDWATER ELEVATION CONTOUR MAP		CONTRACT NO.	
							LJK	11/3/03		OCTOBER 29, 2003		5883	
										SITE 250		APPROVED BY	DATE
										SITE ASSESSMENT REPORT		APPROVED BY	DATE
									NAVAL STATION MAYPORT		DRAWING NO.	FIGURE 3-1	
									MAYPORT, FLORIDA		REV.	0	

FORM OADR NO. 303-104-02 -- REV 6 -- 1/20/88

MAYPORT NS/RT/2003/250/GND/ENR/07103



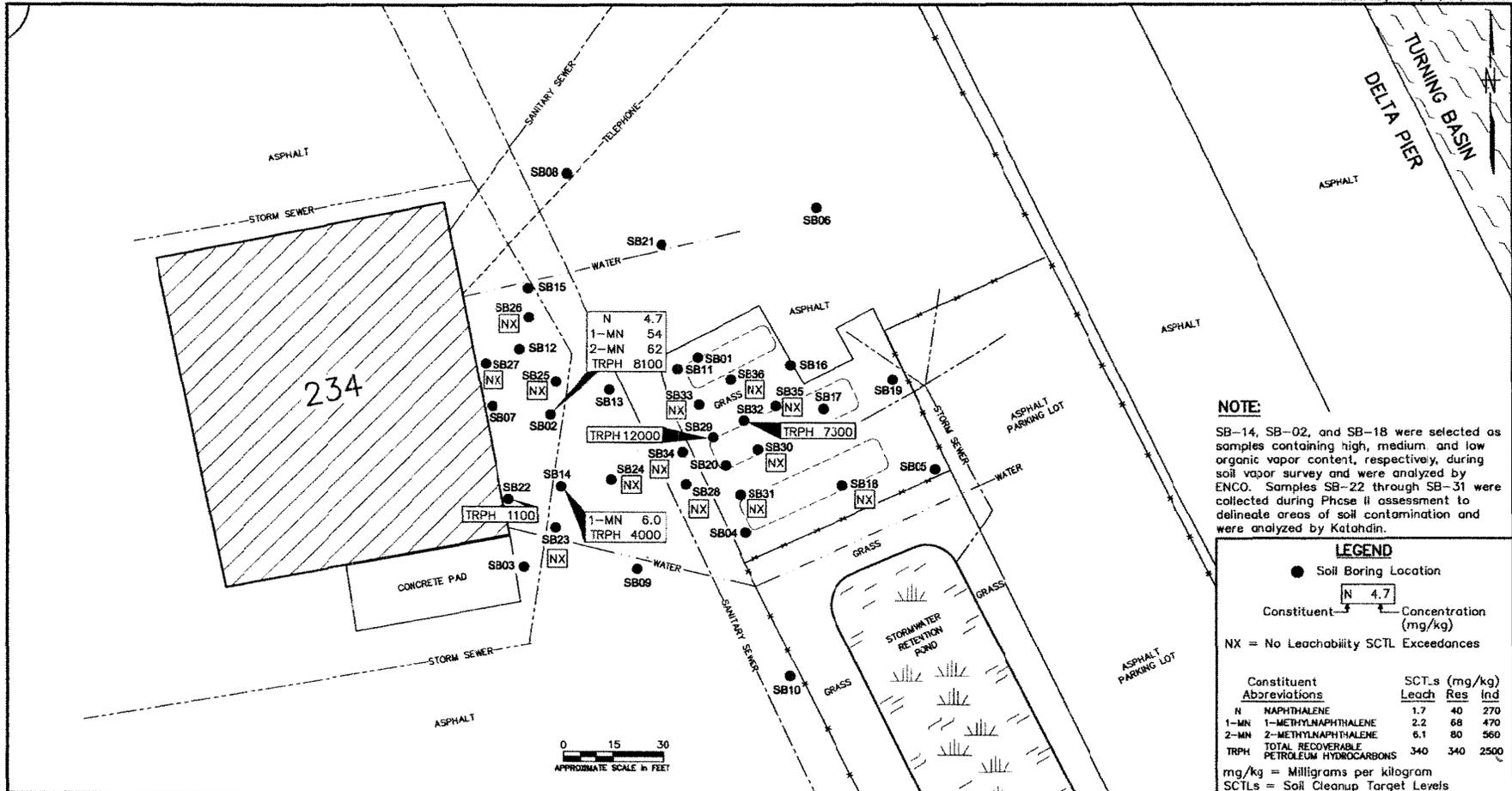
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							LLK	12/01/03			APPROVED BY	DATE		
											APPROVED BY	DATE		
											DRAWING NO. <td>FIGURE 3-2</td> <td>REV. <td>0</td> </td>	FIGURE 3-2	REV. <td>0</td>	0

FORM GND NO. ENR\_BH/2002 - REV 0 - 1/22/03

05JAX0016



MAYPORT NS\CTO303\250\CAD\06635AD001



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

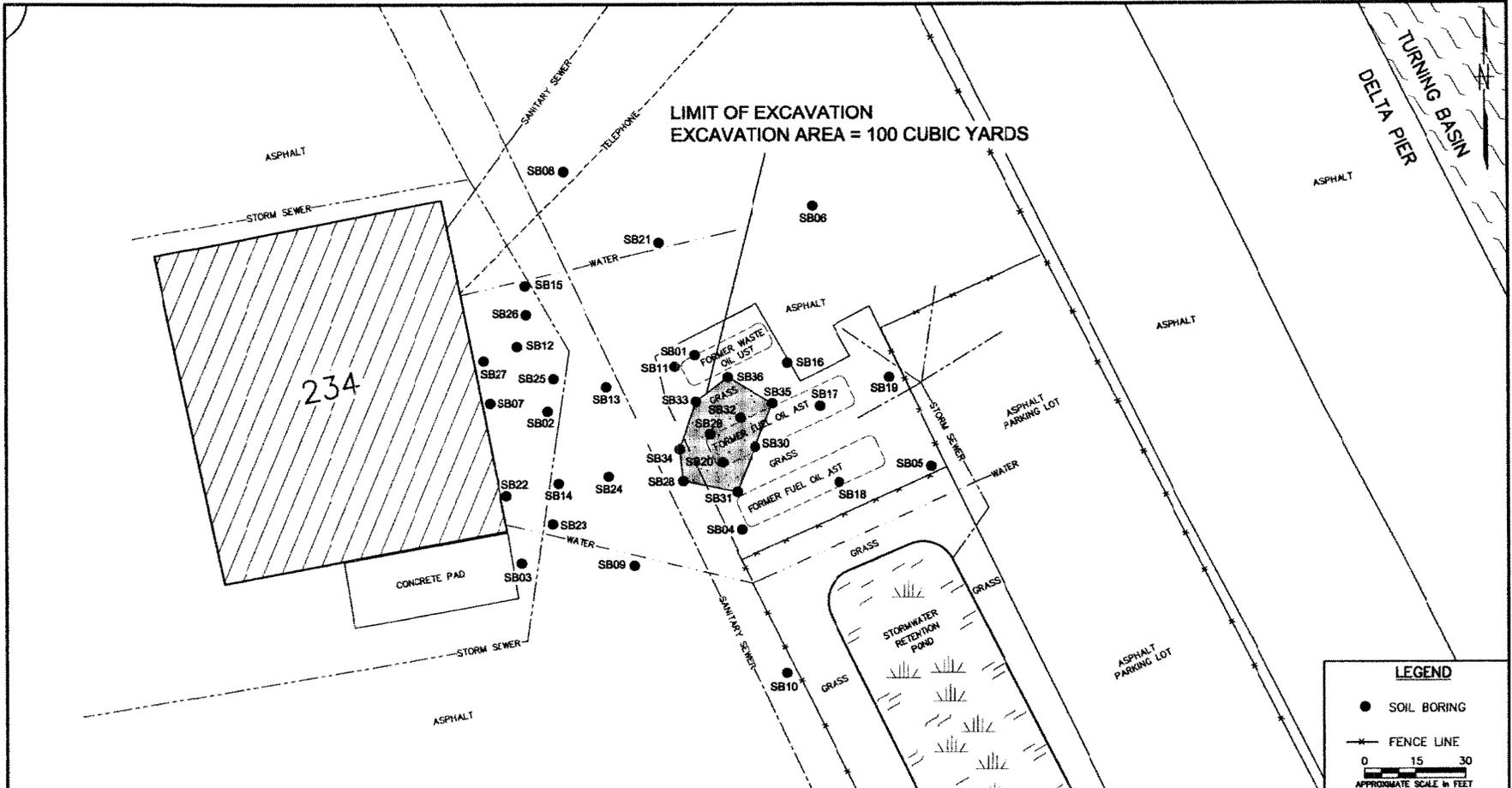
DRAWN BY LLK DATE 10/21/03  
CHECKED BY DATE  
COST/SCHED-AREA  
SCALE AS NOTED



FIXED-BASE SOIL ANALYTICAL RESULTS  
EXCEEDING SCTLs  
SITE 250  
SITE ASSESSMENT REPORT  
NAVAL STATION MAYPORT  
MAYPORT, FLORIDA

CONTRACT NO.	5863
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	FIGURE 3-5
REV.	1

FORM CADD NO. SHV\_BLDWIC - REV 0 - 1/20/98



**LEGEND**

- SOIL BORING
- +— FENCE LINE

0 15 30  
APPROXIMATE SCALE IN FEET

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

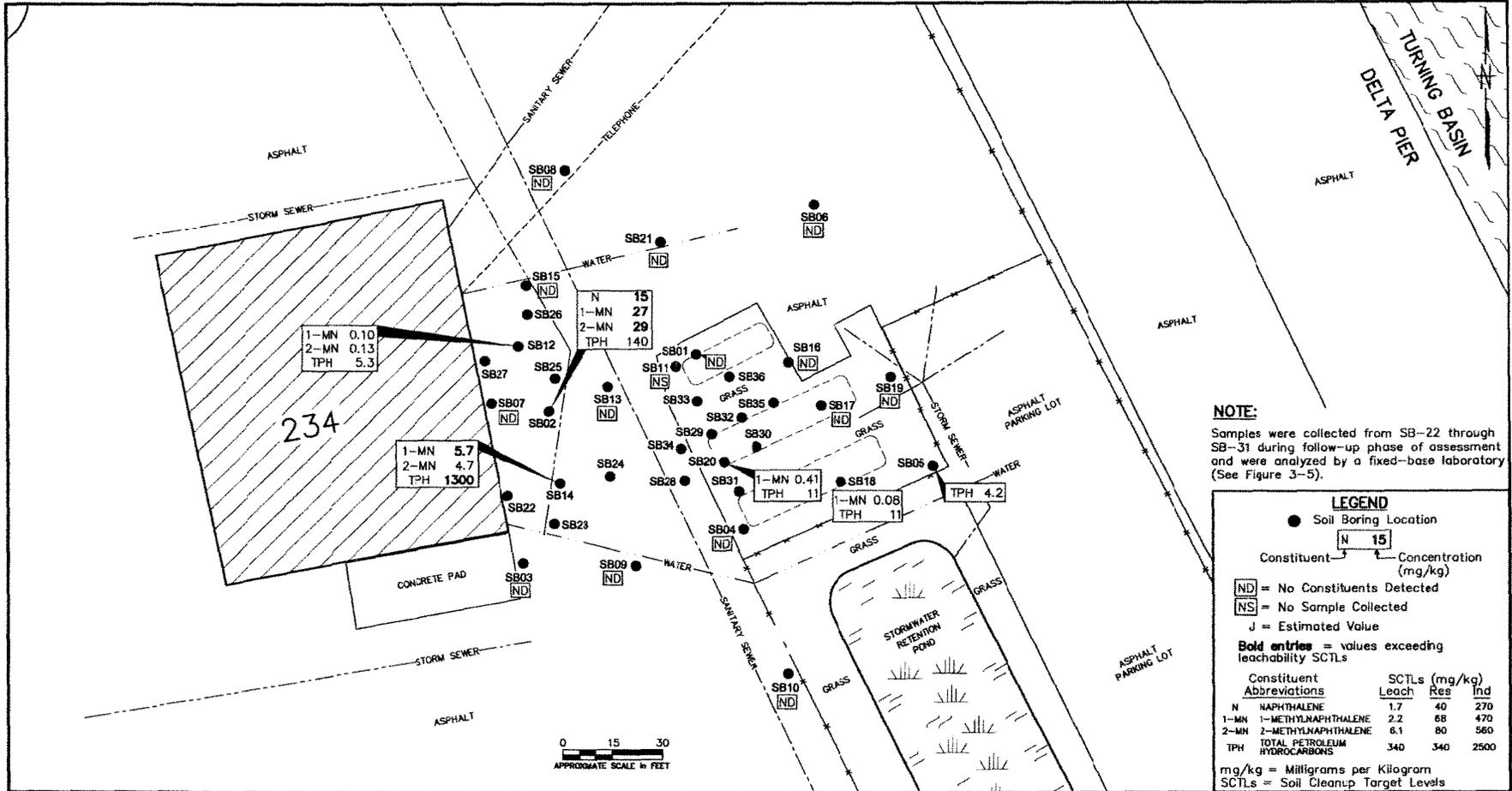
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 COST/SCHED-AREA:        
 SCALE: AS NOTED



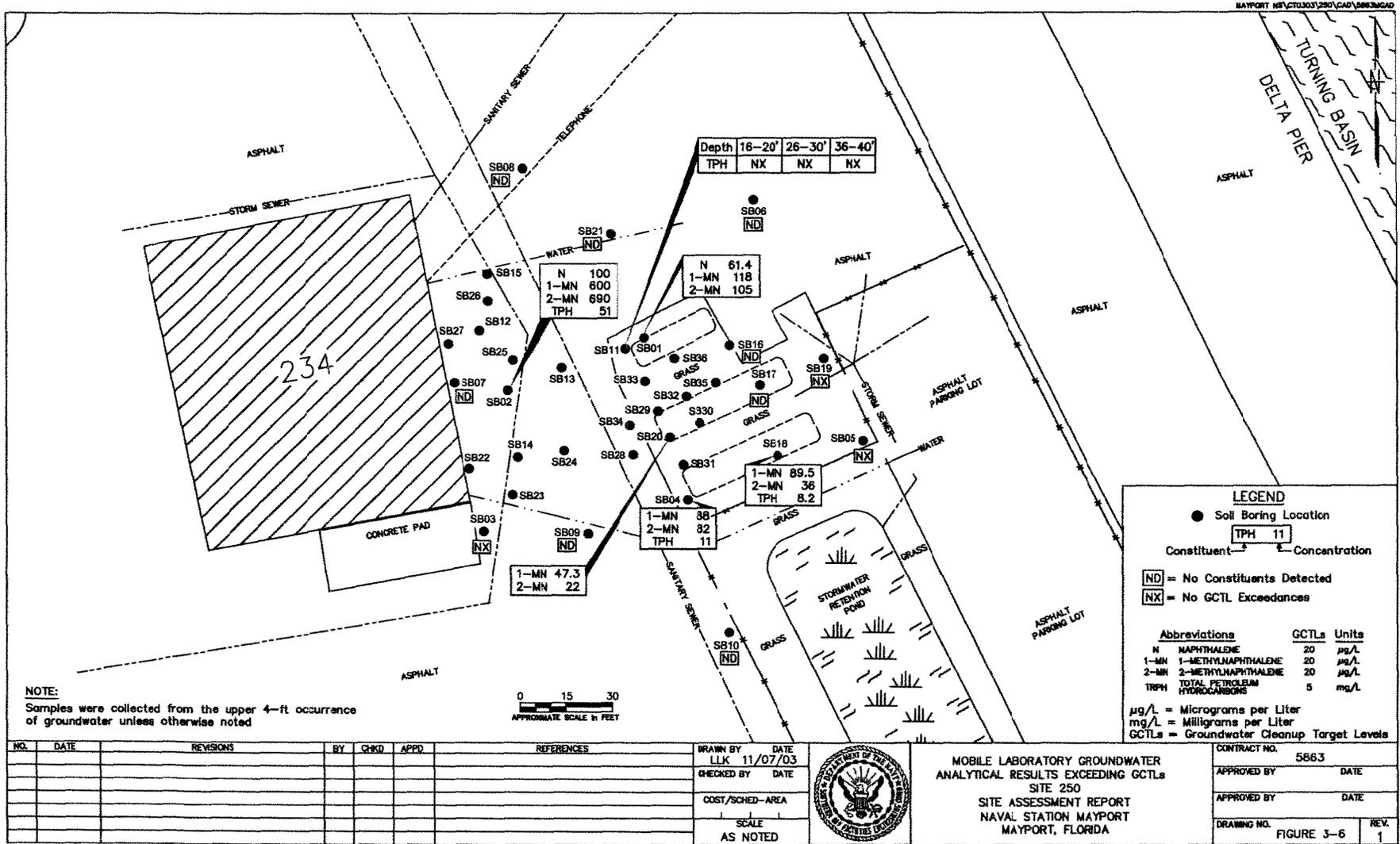
PROPOSED AREA OF EXCAVATION  
 SITE 250  
 SITE ASSESSMENT REPORT  
 NAVAL STATION MAYPORT  
 MAYPORT, FLORIDA

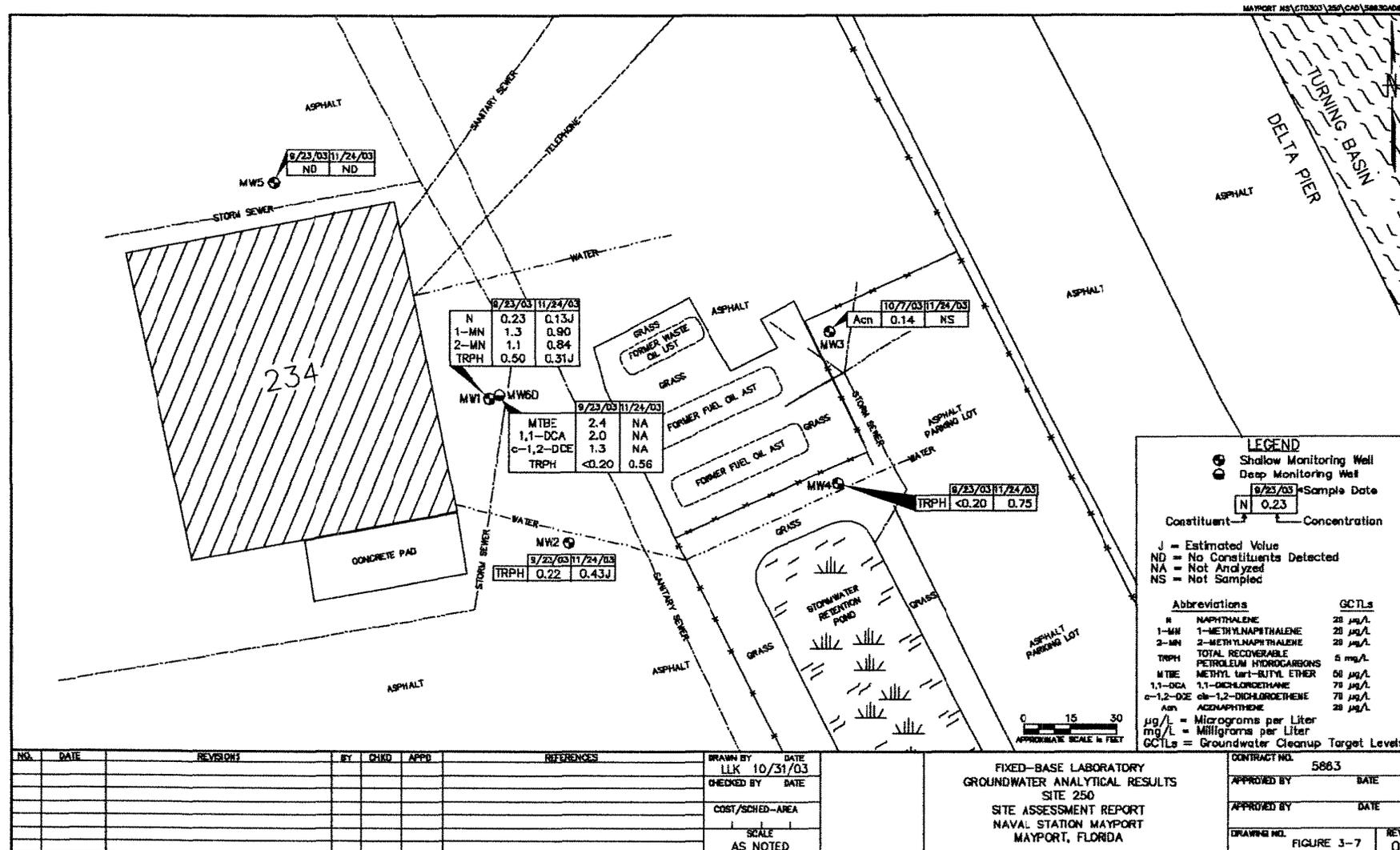
CONTRACT NO. 5863  
 APPROVED BY:      DATE:        
 APPROVED BY:      DATE:        
 DRAWING NO. FIGURE 6-1      REV. 0

MAYPORT NS/CT0303/250/CAD/5863/MSAD



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE		<b>MOBILE LABORATORY SOIL ANALYTICAL RESULTS</b> SITE 250 SITE ASSESSMENT REPORT NAVAL STATION MAYPORT MAYPORT, FLORIDA	CONTRACT NO.	APPROVED BY	DATE
							LLK	11/06/03			5863		
							COST/SCHED-AREA	SCALE			DRAWING NO.	REV.	
							AS NOTED				FIGURE 3-4	1	





FORM OADR NO. 303-98-0002 - REV 0 - 1/20/98

05JAX0016

**APPENDIX B**

**TANK CLOSURE REPORT**

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**TANK CLOSURE REPORT FOR  
THE WASTE OIL TANK AT BUILDING 250  
MAYPORT NAVAL STATION**

Prepared for:

NAVFAC COMBINED ACQUISITION OFFICE  
MAYPORT ZONE  
P.O. BOX 280157  
NAVAL STATION MAYPORT FL. 32228-0157  
CONTRACT ORDER: N68931-98-M-5093  
DELIVERY ORDER: SBA# 0491-98-80193

Prepared by:

Ellis Environmental Group, LC  
106 SW 140 Terrace  
Newberry Florida 32667  
352-332-3888

NAVFAC COMBINED ACQUISITION OFFICE  
MAYPORT ZONE  
P.O. BOX 280157  
NAVAL STATION MAYPORT FL. 32228-0157  
ATTN: BOBBY CHESTNUT  
CONTRACT ORDER: N68931-98-M-5093  
DELIVERY ORDER: SBA# 0491-98-80193

**RE: REMOVAL OF WASTE OIL STORAGE TANK AT BUILDING 250 UNDER  
CONTRACT # N68931-98-M-5093**

## **INTRODUCTION**

On May 30, 1998 Ellis Environmental Group, LC. (EEG) was awarded a contract to remove a 10,000 gallon waste oil storage tank in the vicinity of building 250 of the Mayport Naval Air Station. After completing contract Submittals and attending a pre construction meeting on June 4, 1998, EEG mobilized to the site to complete the tank removal task on July 6, 1998.

## **SITE HISTORY**

The Mayport Naval Station is located near the mouth of the St. Johns River and is accessible from Atlantic boulevard and Mayport road. The installation consists of Post-World War II Facilities as well as training, ship support, and docking areas. The installation is located on a very flat, sandy terrain with little or no slope. The St Johns river forms the northern border of the Naval station. The installation is completely serviced with waste and storm water collection and control systems that prevent super charge or migratory discharge into the inland waterway. (see Figure 1 for site location)

The 10,000 gallon tank was installed at building 250 in June of 1980 as a storage system of waste oils prior to burning those oils in a boiler that provided steam and hot water for the Naval facility (Figure 1 Project Location). This use of the underground Storage Tank (UST) as a storage system for heating oils precludes any regulatory concerns and renders this tank a "non regulated" item for the purposes of reporting and removal under FAC 62-770. In May of 1998 Florida Department of Environmental Protection's (FDEP) designate, The Jacksonville Department of Environmental Protection (JDEP) was sent a notification of tank removal. Direct conversations with the JDEP indicated that they were aware the tank was not regulated and agreed that no representative from their office would be on the Mayport site during any of the removal phase. Further, no reports or documents are required to be sent to them concerning the removal and closure of this tank system.

## TANK REMOVAL

On June 4, 1998, samples of the soils and samples of the sludge in the tank were taken in accordance with the EEG Comprehensive Quality Assurance Plan ( COMQAP) approved by the Florida Department of Environmental Protection (FDEP) #940141. The soils in the pump pit were also sampled for analysis . The pump pit samples were composed of lime rock aggregate and extended from 3.5 feet Below Grade (BG) to approximately 5 feet BG. They were visibly stained with product and were, therefore, sampled. The samples were taken at that time to identify the Hazardous - non-Hazardous constituents of the various media and to prepared for removal and proper disposal of the soils and the tank contents. The results of these analysis are presented in Attachment A. The analysis of the sludge in the tank showed the lead concentration to be 0.07 mg/L. This is well below the regulatory limits and can be considered non hazardous waste materials. The soil analysis indicated a TRPH of over 28000 mg/kg and PAHs which is indicative of heavy petroleum type of waste. The total lead and Chromium were below regulatory levels and, therefore, this soil can also be disposed of as non hazardous waste. The analytical results were received on June 18, 1998. This allowed EEG to plan the transportation and disposal of the waste well in advance of the actual removal date. .

On July 6, 1998 EEG and its subcontractors mobilized to the Mayport site to remove the 10,000 gallon waste oil tank. Figure 2 illustrates the location of the tank in relation to building 250 on the Mayport Naval Station site. Figure 3 is a photograph of the site taken by the project manager prior to beginning the tank removal project. A Safety meeting was held with all the closure participants to discuss the work schedule and the potential hazards. The tank removal project began approximately 8:35 A.M. .

The utilities were identified and tagged out of service. Volt Ohm Meter (VOM) readings were taken to be certain that all electrical supply to the lines was indeed discontinued. Wire was pulled and the conduit was cut and capped. Fuel lines , meters, vent lines were disconnected and vacuumed to remove any product. Pumps , filters and lines were disconnected in the pump pit and the pit itself was readied for removal. The tank manways were removed and the product and sludge that remained in the tank was removed. The tank was washed and the water was removed for disposal. A certified marine inspector tested and declared the tank gas free. Approximately 2000 gallons of sludge and waste water were removed using a vacuum truck suction system. This waste stream was shipped to Industrial Waste Services of Jacksonville, Florida for disposal under a non hazardous materials manifest. The Generator copy of the manifest was given to a public works representative. .

The pump pit concrete was removed and decontaminated on a plastic lay-down water retention area. Once decontaminated the concrete was crushed and placed on the truck for disposal. The wash water was vacuumed up and disposed of .The Man ways and other concrete removed were handled in a similar manner. Figure 4 illustrates the excavation and manway removal.

Having removed all the appruences, excavation began on and around the tank. The tank straps were exposed and cut. Initial information indicated that the ground water was at 3.5 feet BG. However, no groundwater was encountered down to and including the level at the bottom of the tank ( approximately 11 feet). At this time the tank was uncovered and lifted. The tank proved

---

to be 28.5 feet long and 8.1 feet in diameter. This dimension verifies that the tank is not a 10,000 gallon tank but rather a 12,500 gallon tank. The tank was removed and placed directly on the transport vehicle. Holes were cut in the tank as required for transportation. The tank was transported off site and delivered to an acceptable disposal facility. The disposal certification is provided in Attachment B.

Excavation of soils under the pump pit indicated the presence of a petroleum vapor smell. This was as expected. The presence of contaminated soils was observed from a point directly under the pit and running along the tank outer wall for about 8 feet and down to a depth of 11 feet. These soils were removed and placed in a roll-off container for disposal at an approved soil treatment facility. The amount of soils removed was approximately 25 yards or 35 tons.

Once the tank and contaminated soils were removed, the excavation was back filled with 32 tons of stone and 100 tons of fill. The fill was graded and sodded as per the contract arrangements.

#### **Summary and Conclusions**

The removal of the waste oil tank was uneventful. The tank however, was not a 10,000 tank but was a 12,500 gallon tank. All soils, sludges and wash waters were disposed of under non-hazardous manifest as a petroleum related product at approved or licensed facilities. The tank pit was back filled with clean fill and stone, and sod was placed over the area. This tank closure was considered a clean closure and should require no further action.

**FIGURES**

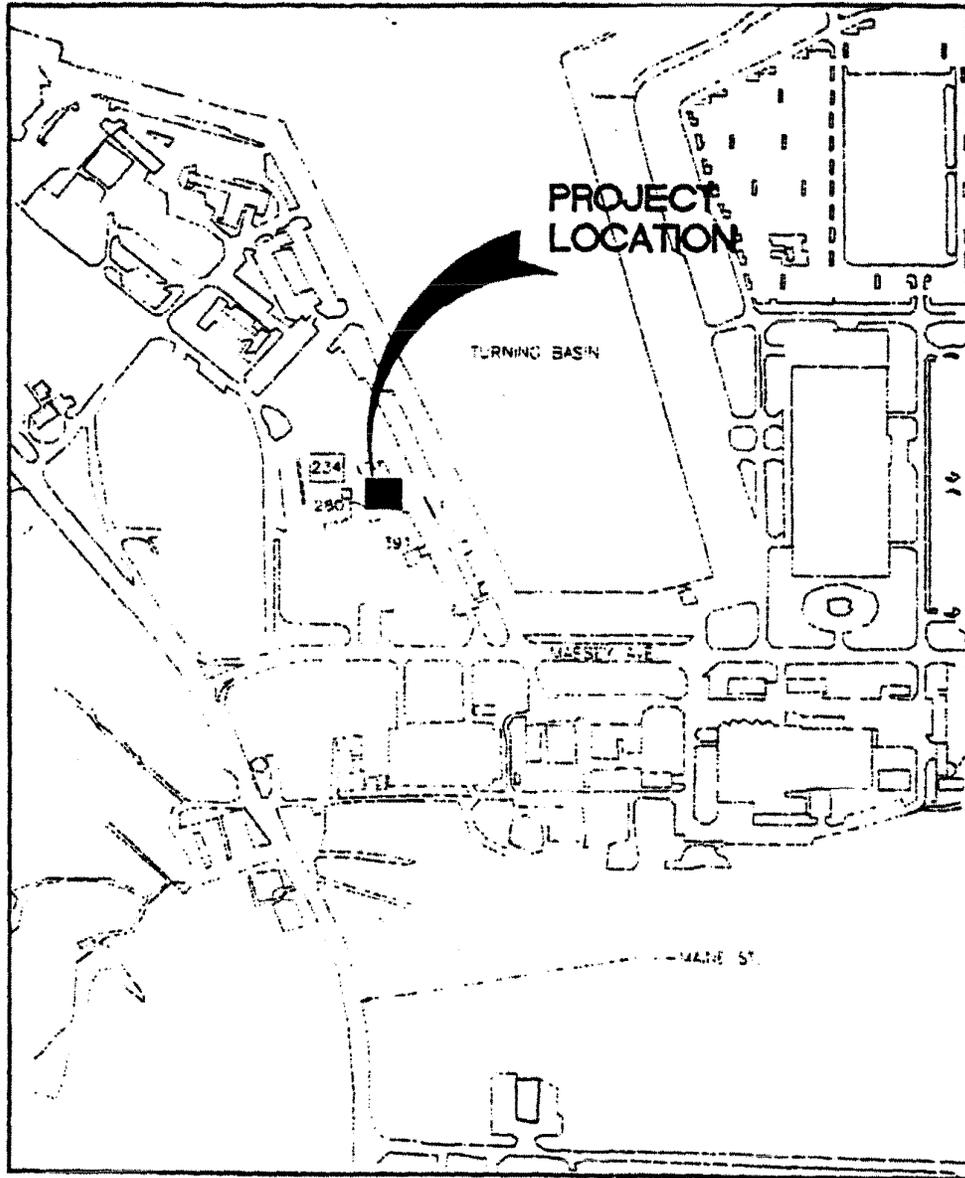


Figure 1

Project Location  
N68931-98-M-5093



Ellis  
Environmental  
Group, LC

WASTE OIL STORAGE TANK REMOVAL  
July 6, 1998

Mayport Naval Station  
Mayport, Florida

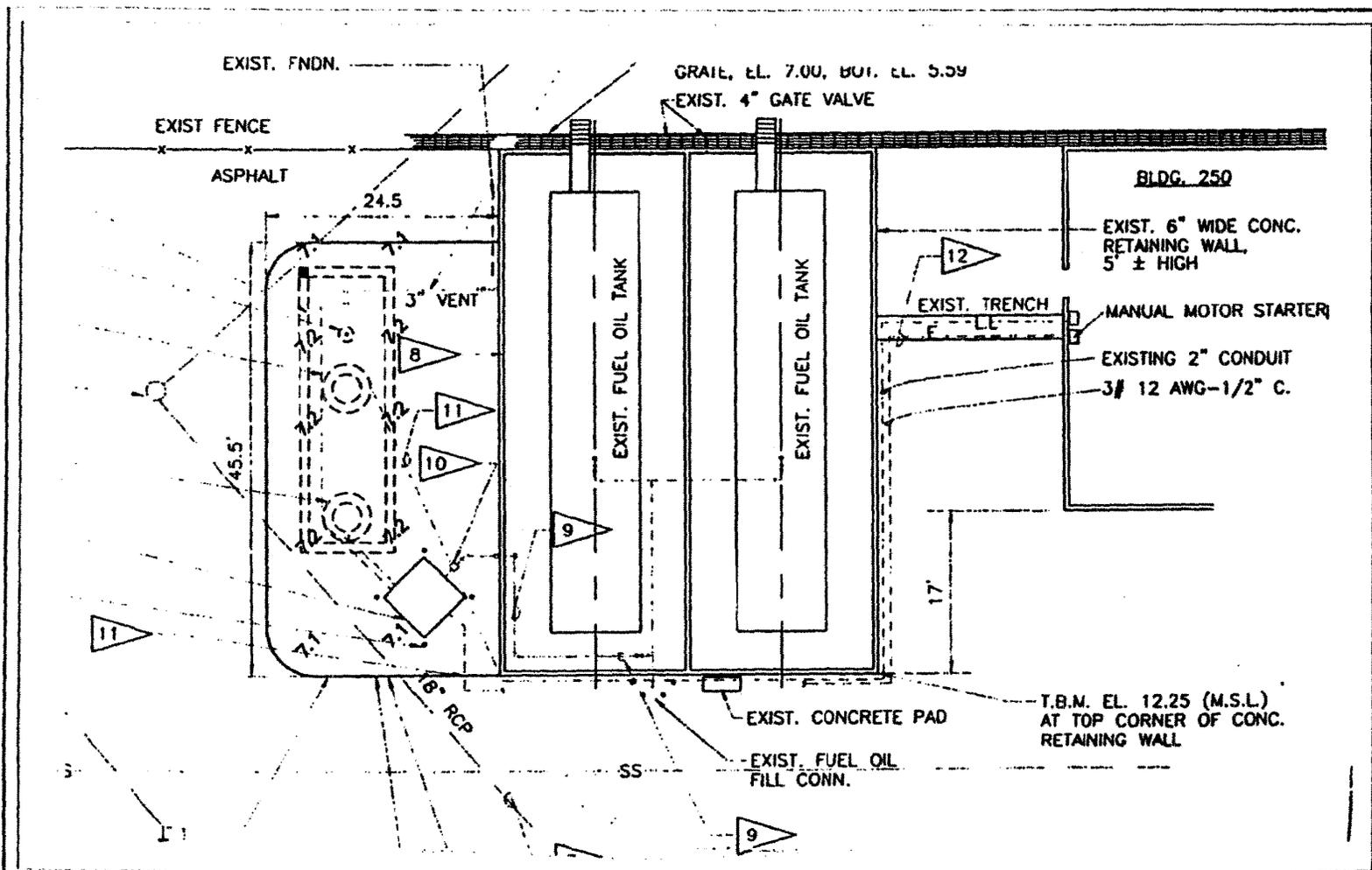


Figure 2

Waste Oil Tank Location  
N68931-98-M-5093



Waste Oil Storage Tank Removal  
July 6, 1998

Mayport Naval Station  
Mayport, Florida

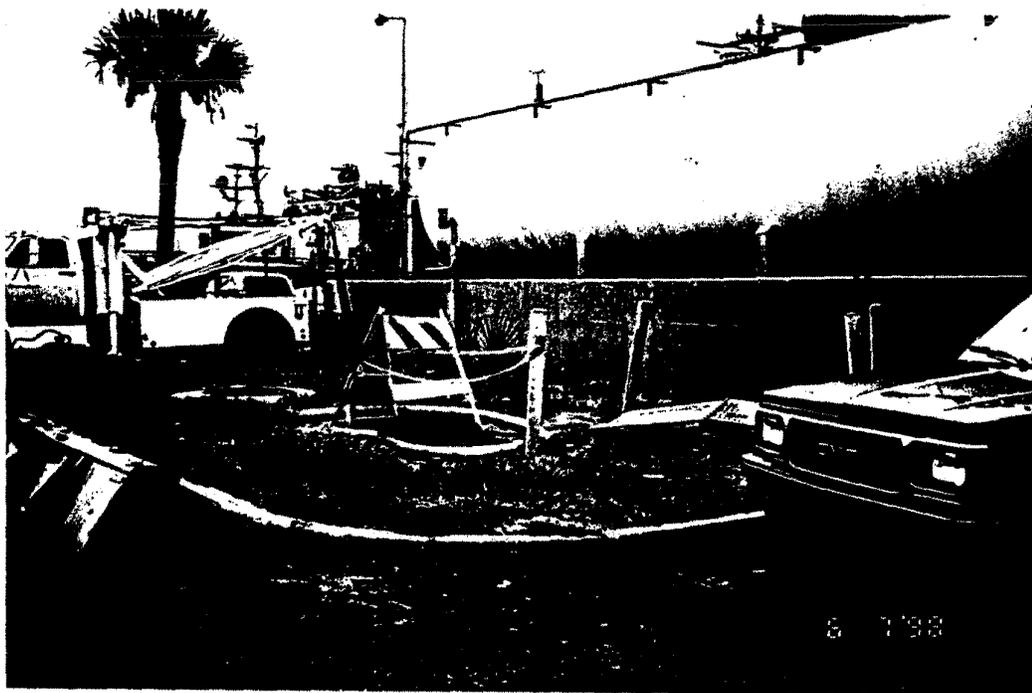


Figure 3

Photograph of Site  
During Tank Removal  
N68931-98-M-5093



Ellis  
Environmental  
Group, LC

WASTE OIL STORAGE TANK REMOVAL  
July 6, 1998

Mayport Naval Station  
Mayport, Florida



Figure 4

Photograph of Site During  
Man Way Removal



Ellis  
Environmental  
Group, LC

WASTE OIL STORAGE TANK REMOVAL  
July 6, 1998

Mayport Naval Station  
Mayport, Florida

**ATTACHMENT**

**A**

Environmental Conservation Laboratories  
4810 Executive Park Court, Suite 211  
Jacksonville, Florida 32216-6069  
904 / 296-3007  
Fax 904 / 296-6210  
www.encolabs.com



DHRS Certification No. EA2277

CLIENT : Marine Industrial Service  
ADDRESS: 2308 Larsen Road  
Jacksonville, FL 32207

REPORT # : JR2237A  
DATE SUBMITTED: July 10, 1998  
DATE REPORTED : July 24, 1998

PAGE 1 OF 2

ATTENTION: Mr. Tom Phillips

**SAMPLE IDENTIFICATION**

Samples submitted and  
identified by client as:

07/10/98

#1 - NAS MAYPORT UST @ 08:00

PROJECT MANAGER

  
Scott D. Martin

ENCO LABORATORIES  
 REPORT # : JR2237A  
 DATE REPORTED: July 24, 1998

PAGE 2 OF 2

RESULTS OF ANALYSIS

TCLP METALS	METHOD	NAS MAYPORT UST	LAB BLANK	Units
TCLP Lead	1311/6010	1.0 U	0.20 U	mg/L
Date Analyzed		07/21/98	07/21/98	

QUALITY CONTROL DATA

Parameter	% RECOVERY MS/MSD/LCS	ACCEPT LIMITS	% RPD MS/MSD	ACCEPT LIMITS
TCLP Metals				
TCLP Lead, 1311/6010	98/ 99/104	68-126	1	17

Environmental Conservation Laboratories Comprehensive QA Plan #960038

- < = Less Than
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- LCS = Laboratory Control Standard
- RPD = Relative Percent Difference

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Environmental Conservation Laboratories  
4810 Executive Park Court, Suite 211  
Jacksonville, Florida 32216-8089  
904 / 296-3007  
Fax 904 / 296-6210  
www.encolabs.com



DHRS Certification No. E82277

**CLIENT :** Marine Industrail Service  
**ADDRESS:** 2308 Larsen Road  
Jacksonville, FL 32207

**REPORT # :** JR2237  
**DATE SUBMITTED:** July 10, 1998  
**DATE REPORTED :** July 15, 1998

PAGE 1 OF 3

**ATTENTION:** Mr. Tom Phillips

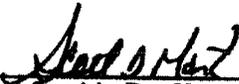
**SAMPLE IDENTIFICATION**

Samples submitted and  
identified by client as:

07/10/98

#1 - NAS MAYPORT UST @ 08:00

**PROJECT MANAGER**

  
\_\_\_\_\_  
Scott D. Martin

ENCO LABORATORIES  
 REPORT # : JR2237  
 DATE REPORTED: July 15, 1998

PAGE 2 OF 3

## RESULTS OF ANALYSIS

<u>NPA METHOD 8100 - POLY AROMATIC HYDROCARBONS</u>	<u>NAS MAYPORT UST</u>	<u>LAB BLANK</u>	<u>Units</u>
Naphthalene	12000 D1	330 U	µg/Kg
2-Methylnaphthalene	26000 D1	330 U	µg/Kg
1-Methylnaphthalene	19000 D1	330 U	µg/Kg
Acenaphthylene	3500 U D1	330 U	µg/Kg
Acenaphthene	3500 U D1	330 U	µg/Kg
Fluorene	3500 U D1	330 U	µg/Kg
Phenanthrene	3500 U D1	330 U	µg/Kg
Anthracene	3500 U D1	330 U	µg/Kg
Fluoranthene	3500 U D1	330 U	µg/Kg
Pyrene	3500 U D1	330 U	µg/Kg
Chrysene	3500 U D1	330 U	µg/Kg
Benzo(a)anthracene	3500 U D1	330 U	µg/Kg
Benzo(b)fluoranthene	3500 U D1	330 U	µg/Kg
Benzo(k)fluoranthene	3500 U D1	330 U	µg/Kg
Benzo(a)pyrene	3500 U D1	330 U	µg/Kg
Indeno(1,2,3-cd)pyrene	3500 U D1	330 U	µg/Kg
Dibenzo(a,h)anthracene	3500 U D1	330 U	µg/Kg
Benzo(g,h,i)perylene	3500 U D1	330 U	µg/Kg
<u>Surrogate:</u>	<u>% RECOV</u>	<u>% RECOV</u>	<u>LIMITS</u>
2-Fluorobiphenyl	*	21	14-146
Date Extracted	07/13/98	07/13/98	
Date Analyzed	07/15/98	07/15/98	

<u>MISCELLANEOUS</u>	<u>METHOD</u>	<u>NAS MAYPORT UST</u>	<u>LAB BLANK</u>	<u>Units</u>
Percent Solids	SM2540G	93	NR	%
Date Analyzed		07/10/98		

- \* - Surrogate recovery unavailable due to matrix interference.
- U - Compound was analyzed for but not detected to the level shown.
- NR - Analysis not requested for this sample.
- DW - Analysis is reported on a "dry weight" basis.
- D1 - Analyte value determined from a 1:10 dilution.

ENCO LABORATORIES  
REPORT # : JR2237  
DATE REPORTED: July 15, 1998

PAGE 3 OF 3

QUALITY CONTROL DATA

<u>Parameter</u>	<u>% RECOVERY</u> <u>MS/MSD/LCS</u>	<u>ACCEPT</u> <u>LIMITS</u>	<u>% RPD</u> <u>MS/MSD</u>	<u>ACCEPT</u> <u>LIMITS</u>
<u>EPA Method 8100</u>				
2-Methylnaphthalene	59/ 46/ 38	28-133	25	21
1-Methylnaphthalene	60/ 48/ 45	23-143	22	21
Acenaphthylene	57/ 46/ 38	15-153	21	16
Fluorene	54/ 45/ 35	11-163	18	13
Pyrene	58/ 50/ 41	15-175	15	15

Environmental Conservation Laboratories Comprehensive QA Plan #960038

< = Less Than  
MS = Matrix Spike  
MSD = Matrix Spike Duplicate  
LCS = Laboratory Control Standard  
RPD = Relative Percent Difference

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A Better Company For Your Professional Analytical Needs

Report No. 23736  
Subject: MAY PORT NAVAL WASTE TANK  
Received: JUN 04 1998

Date JUN 16 1998  
DOH/DEP # 82135/E82031

ELLIS ENVIRONMENTAL GROUP, L.L.C.  
611 N.W. 60TH ST., STE. B  
GAINESVILLE, FL 32607

RESULTS OF ANALYSIS	ANALYSIS METHOD	D. LMT	ANALYST	ANALYSIS DATE/TIME
<u>Sample 1 MAY PORT NAVAL WASTE TANK SOIL 06/04/98</u>				
PURGEABLE AROMATICS LIST - SOIL				
EPA 602		DONE	KH	06/12/98 08:00AM
BENZENE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
MONOCHLORO BENZENE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
O-DICHLORO BENZENE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
M-DICHLORO BENZENE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
P-DICHLORO BENZENE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
ETHYLBENZENE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
TOLUENE	EPA 624 S	110 UG/KG DRY WT	KH	06/12/98 08:00AM
PURGEABLE HALOCARBONS LIST - SOILS				
BROMODICHLOROMETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
BROMOFORM	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
BROMOMETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
CARBON TETRACHLORIDE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
CHLOROETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
2-CHLOROETHYL VINYL ETHER	EPA 624 S	<7.5 UG/KG DRY WT	KH	06/12/98 08:00AM



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A Better Company For Your Professional Analytical Needs

Report No. 23736  
Subject: MAY PORT NAVAL WASTE TANK  
Received: JUN 04 1998

Date JUN 16 1998

DOH/DEF # 82135/EB2031

ELLIS ENVIRONMENTAL GROUP, L.L.C.  
611 N.W. 60TH ST., STE. B  
GAINESVILLE, FL 32607

RESULTS OF ANALYSIS	ANALYSIS METHOD	D. LMT	ANALYST	ANALYSIS DATE/TIME
<u>Sample No. 1 (Continued)</u>				
CHLOROFORM	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
CHLOROMETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
DIBROMOCHLOROMETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
DICHLORODIFLUOROMETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
1,1-DICHLOROETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
1,2-DICHLOROETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
1,1-DICHLOROETHENE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
TRANS-1,2-DICHLOROETHENE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
1,2-DICHLOROPROPANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
CIS-1,3-DICHLOROPROPENE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
TRANS-1,3-DICHLOROPROPENE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
DICHLOROMETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
1,1,2,2-TETRACHLOROETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
TETRACHLOROETHENE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
1,1,1-TRICHLOROETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
1,1,2-TRICHLOROETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM

Page #2  
Report Continues



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A Better Company For Your Professional Analytical Needs

Report No. 23736  
Subject: MAY FORT NAVAL WASTE TANK  
Received: JUN 04 1998

Date JUN 16 1998  
DOH/DEF # 82135/EB2031

ELLIS ENVIRONMENTAL GROUP, L.L.C.  
611 N.W. 60TH ST., STE. B  
GAINESVILLE, FL 32607

RESULTS OF ANALYSIS	ANALYSIS METHOD	D. LMT	ANALYST	ANALYSIS DATE/TIME
<u>Sample No. 1 (Continued)</u>				
TRICHLOROETHENE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
TRICHLOROFLUOROMETHANE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
VINYL CHLORIDE	EPA 624 S	<2.5 UG/KG DRY WT	KH	06/12/98 08:00AM
PERCENT SOLIDS	ASTM D2216	94.70 %	MB	06/08/98 09:00AM
ARSENIC	SW 7061	1.46 MG/KG	MB	06/09/98 08:00AM
BARIUM	SW 6010	42.4 MG/KG	RF	06/10/98 12:58PM
CHROMIUM	SW 6010	46.7 MG/KG	RF	06/10/98 12:58PM
LEAD	SW 6010	142 MG/KG	RF	06/10/98 12:58PM
MERCURY	SW 7470	.188 MG/KG	MB	06/11/98 09:50AM
SELENIUM	SW 7741	< .201 MG/KG	MB	06/10/98 08:00AM
SILVER	SW 6010	< .6400 MG/KG	RF	06/12/98 11:05AM
TOTAL RECOVERABLE PETROLEUM HYD	EPA 418.1S	28000 MG/KG	KH	06/08/98 08:00AM

Additional Notes & Comments for Sample Report 23736

23736\*1 EPA 624 S Subcontracted To: ENVIRO LAB 83160  
23736\*1 EPA 418.1S Subcontracted To: ENVIRO LAB 83160

Respectfully Submitted for ABC Research

*K Hatfield for VK*  
Victor Kowalski, Ph.D.  
Director, Quality Control

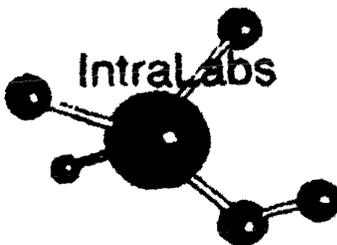


06/12/98 11:28 IWS LAB + 3463177

NO. 494 P002/00

06/12/98 09:34 904-781-1486  
06/12/98 17:11 904-781-1486

PAGE 02



I.W.S. Tom Reader  
1640 Talleyrand Ave.  
Jacksonville, FL 32206

Page: 1  
June 11, 98  
Report#: 9806000299  
Order #: 80037008  
FDEP CompQAP#920323

Site location/Project  
2453

Sample Id: 2453  
Collected: 06/04/98 11:30  
Received: 06/05/98 10:00  
Collected by: Client

PARAMETER	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Arsenic, TCLP	BDL	mg/L	1311/7061A	0.010	06/05/98	06/08/98	EB6349
Barium, TCLP	BDL	mg/L	1311/7080A	0.100	06/05/98	06/08/98	EB6349
Cadmium, TCLP	BDL	mg/L	1311/7130	0.050	06/05/98	06/08/98	EB6349
Chromium, TCLP	BDL	mg/L	1311/7190	0.100	06/05/98	06/08/98	EB6349
Lead, TCLP	0.071	mg/L	1311/7421	0.005	06/05/98	06/09/98	EB6349
Mercury, TCLP (Cold Vapor AA)	BDL	mg/L	1311/7470A	0.000	06/05/98	06/08/98	EB6349
Selenium, TCLP	BDL	mg/L	1311/7741A	0.010	06/05/98	06/08/98	EB6349
Silver, TCLP	BDL	mg/L	1311/7760A	0.100	06/05/98	06/08/98	EB6349
TCLP Extraction Procedure	DONE		1311 Extra				EB6349

Report Comments:

BDL Indicates Analyte is Below Detection Limit  
Qualifier following result conforms to FAC 62-160 Table 7  
62-160: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PCL shall be used.

MEDF: Matrix Effected Dilution Factor  
Unless otherwise noted, mg/Kg denotes wet weight

Thomas A. Carr, Principal

**ATTACHMENT**

**B**

**MIS** Marine Industrial Services, Inc.

P.O. Box 43175  
Jacksonville, FL  
32203-3175  
(904) 346-3266

July 28, 1998

Ellis Environmental  
611 NW 60th Street, Suite B  
Gainesville, FL 32607  
Phone: (352)332-3888  
Fax: (352)332-3222

Subject: Disposal of 1-10,000 gallon underground storage tank removed from Mayport Naval Air Station

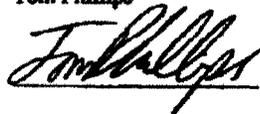
Attn: Mr. Joe Capella

Dear Joe,

This letter is to verify that the 10,000 gallon underground storage tank removed from Mayport Naval Air Station, Jacksonville FL by Marine Industrial Services on July 6, 1998 for Ellis Environmental was cleaned and transported to Berman Brothers Inc. 2500 Evergreen Av. Jacksonville, FL for recycling as steel scrap.

Sincerely,

Tom Phillips



Marine Industrial Services, Inc.

**NON-HAZARDOUS WASTE MANIFEST**

1. Generator's US EPA ID No. **FL91700242607970** Manifest Document No. **38226**

2. Page 1 of **N.O. 82976**

3. Generator's Name and Mailing Address  
**NAVYPOST MILITARY AIR STATION**

**BUILDING 8200 - 856 1986**

4. Generator's Phone (924) **270-6468**

5. Transporter 1 Company Name  
**HAZARD INDUSTRIAL SERVICES**

6. US EPA ID Number  
**FL 0000908376**

A. Transporter's Phone  
**904-246-8266**

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address  
**HAZARD INC**

**11222 WOODCROSS HWY  
SCHEFFER, GA**

10. US EPA ID Number  
**295102012361**

C. Facility's Phone  
**912-579-9979**

11. Waste Shipping Name and Description

a. **PETROLEUM CONTAMINATED SOIL**

12. Containers No.	Type	13. Total Quantity	14. Unit wt/vol
001	RO	23	CL

D. Additional Descriptions for Materials Listed Above

① petroleum contaminated soil

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name **Wayne C. Hagwood**

Signature **Wayne C. Hagwood** Month **10** Day **28** Year **97**

17. Transporter 1 Acknowledgement of Receipt of Materials  
Printed/Typed Name **TOM PHILLIPS - HCS**

Signature **Tom Phillips** Month **10** Day **29** Year **97**

18. Transporter 2 Acknowledgement of Receipt of Materials  
Printed/Typed Name

Signature Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name **Peggy Crews**

Signature **Peggy Crews** Month **11** Day **23** Year **97**

TRANSPORTER #1

NON-HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No.	Manifest No. <b>7009</b>	2. Page 1 of <b>W.O. #2976</b>
3. Generator's Name and Mailing Address <b>NEPTUNE ROYAL AIR STATION</b> <b>BUILDING #250</b> Phone ( )		A. Transporter's Phone <b>MTS #1200</b> <b>(904)-346-3266</b>		
5. Transporter 1 Company Name <b>NEPTUNE INDUSTRIAL SERVICES INC.</b>	6. US EPA ID Number <b>P 00 00 9 08 376</b>	B. Transporter's Phone		
7. Transporter 2 Company Name	8. US EPA ID Number	C. Facility's Phone <b>(912)-579-9979</b>		
9. Designated Facility Name and Site Address <b>NEPTUNE INC.</b> <b>11122 WINDROSS HWY</b> <b>SCHWENK, GA</b>	10. US EPA ID Number <b>2 9 5 1 0 2 0 1 2 3 6 1</b>			
11. Waste Shipping Name and Description	12. Containers		13. Total Quantity	14. Unit We/Vol
	a. <b>PETROLIUM CONTAMINATED SOIL</b>	No. <b>23</b>	Type <b>RD</b>	<b>0 1 2 3 7</b>
	b.			
	c.			
	d.			
D. Additional Descriptions for Materials Listed Above		E. Handling Codes for Wastes Listed Above		
15. Special Handling Instructions and Additional Information				
16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to regulation under reporting proper disposal of Hazardous Waste.				
Printed/Typed Name		Signature		Month Day Year
17. Transporter 1 Acknowledgment of Receipt of Materials		Signature		Month Day Year
Printed/Typed Name <b>Tom Phillips, MTS</b>		Signature		<b>7 6 98</b>
18. Transporter 2 Acknowledgment of Receipt of Materials		Signature		Month Day Year
Printed/Typed Name		Signature		Month Day Year
19. Discrepancy Indication Space				
20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in item 19.				
Printed/Typed Name		Signature		Month Day Year
		Signature <b>Peggy Crows</b>		<b>7 1 98</b>

GENERATOR

TRANSPORTER

FACILITY

TRANSPORTER #1

**APPENDIX C**

**LIMITED SITE ASSESSMENT LETTER REPORT**



**TETRA TECH NUS, INC.**

794 S. Military Trail ■ Deerfield Beach, Florida 33442  
(954) 570-5885 ■ FAX (954) 570-5974 ■ www.tetrattech.com

TtNUS/DFB-99-103/7867/3.2

23 March, 1999

Project Number 7867

Commanding Officer  
Department of the Navy  
Southern Division  
Naval Facilities Engineering Command  
ATTN: Ms. Beverly Washington (Code 1848)  
Remedial Project Manager  
2155 Eagle Drive, P.O. Box 10068  
North Charleston, South Carolina 29411-0068

Reference: Clean Contract No. N62467-94-D0888  
Contract Task Order No. 0064A

Subject: Site Assessment Report for UST Site 250  
Naval Station Mayport, Florida

Dear Ms. Washington:

Tetra Tech NUS, Inc. (TtNUS) has completed a limited site assessment at UST Site 250. UST Site 250 was the former location of a 12,500-gallon waste oil tank. This limited site assessment was performed to investigate the presence of petroleum constituents in the vadose zone and in the shallow aquifer beneath UST Site 250. A tank closure report previously submitted for this tank was deemed to be inaccurate, therefore the activities described herein were requested by SouthDiv Navy to be performed.

**FIELD INVESTIGATION**

TtNUS mobilized to UST Site 250 on March 15, 1999 to install six Geoprobe™ soil borings and collect soil and groundwater samples. Four soil samples were collected from the vadose zone in soil borings GB-01, GB-02, GB-03, and GB-04. Two groundwater samples were collected from the shallow aquifer by use of temporary well points installed in soil borings GB-01 and GB-02. In each of the borings, soil was collected at 2 foot intervals and screened with an Organic Vapor Analyzer (OVA) for detection of organic vapors. Locations of Geoprobe™ soil borings are included on **Figure 1**. Lithologic boring logs from each of the borings are included as **Attachment 1**. OVA screening results are summarized on **Table 1**.

**INVESTIGATION RESULTS**

OVA screening results indicate that organic vapors were detected above FDEP guidelines for a waste oil site. In accordance with Rule 62-770.200 (2), Florida Administrative Code (FAC), OVA headspace levels in excess of 50 parts per million (ppm) for a waste oil site indicate the presence of "excessively contaminated" soils. Soil collected from borings GB-01, GB-02, GB-03 and GB-04

Ms. Beverly Washington  
SOUTHNAVFACENCOM  
March 23, 1999 – Page 2

had readings above the FDEP limit. OVA readings ranged from 10 ppm to greater than 1000 ppm.

Groundwater samples collected from the temporary well points GB-01 and GB-02 were analyzed for Volatile Organics, Semi-volatile Organics, Total Recoverable Petroleum Hydrocarbons (TRPH), RCRA metals and TCLP metals. Laboratory analytical results indicate that the sample collected from well point GB-02 contained TRPH levels of 11 mg/l, above FDEP Groundwater Cleanup Target Levels (GCTLs) of 5 mg/l. All other parameters tested for in the groundwater collected from well points GB-01 and GB-02 were not detected above FDEP GCTLs. A summary of groundwater analytical results is presented as **Table 2**.

Soil samples collected from the soil borings GB-01, GB-02, GB-03 and GB-04 were analyzed for Volatile Organics, Semi-volatile Organics, TRPH, RCRA metals, and TCLP metals. Results indicated that TRPH levels were detected above the FDEP Soil Cleanup Target Levels (SCTLs) in soil borings GB-01, GB-03 and GB-04. A summary of soil analytical results is presented as **Table 3**. Copies of soil and groundwater analytical reports are presented in **Attachment 2**.

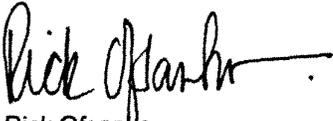
#### SUMMARY

The results of TtNUS' limited scope assessment at UST Site 250 suggest the following:

- Organic vapors in excess of 50 ppm were detected in soil collected from soil borings GB-01 through GB-04.
- Laboratory analysis of soil collected from soil borings GB-01, GB-03, and GB-04 indicates the presence of TRPH at levels above FDEP SCTLs.
- Laboratory analysis of groundwater collected from temporary well points GB-01 and GB-02 indicates that volatiles, semi-volatiles, and metals compounds are not present in the shallow aquifer. TRPH concentrations above FDEP GCTLs were detected in the groundwater collected from well point GB-02.

If you have any questions regarding this report or require further information, please contact me at (954) 570-5885 extension 250.

Very truly yours,



Rick Ofsanjo  
Task Order Manager

RO/jj

Enclosures (1)

c: Ms. D. Wroblewski (w/o enclosure)  
Mr. M. Perry/File  
Ms. C. Mitchell, NS Mayport

**TABLE 1  
SOIL VAPOR MEASUREMENTS**

<b>Soil Boring No.</b>	<b>Date of Measurement</b>	<b>Sample Interval (feet bls)</b>	<b>Total Readings (ppm)</b>	<b>Carbon Filtered (ppm)</b>	<b>Net Reading (ppm)</b>
GB-01	3/15/99	0-2	0	0	0
		2-4	50	10	40
		4-6	>1000	0	>1000
GB-02	3/15/99	0-2	0	0	0
		2-4	220	20	200
		4-6	340	40	300
GB-03	3/15/99	0-2	2	2	0
		2-4	250	0	250
		4-6	>1000	0	>1000
GB-04	3/15/99	0-2	0	0	0
		2-4	320	20	300
		4-6	340	40	300
GB-05	3/15/99	0-2	0	0	0
		2-4	10	10	0
		4-6	0	0	0
GB-06	3/15/99	0-2	0	0	0
		2-4	0	0	0
		4-6	30	20	10

ppm = part per million equivalent methane  
bls = below land surface

**TABLE 2: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY**

**Facility Name: UST Site 250, Naval Station Mayport**

<= below laboratory detection limit

NCD = no compounds detected

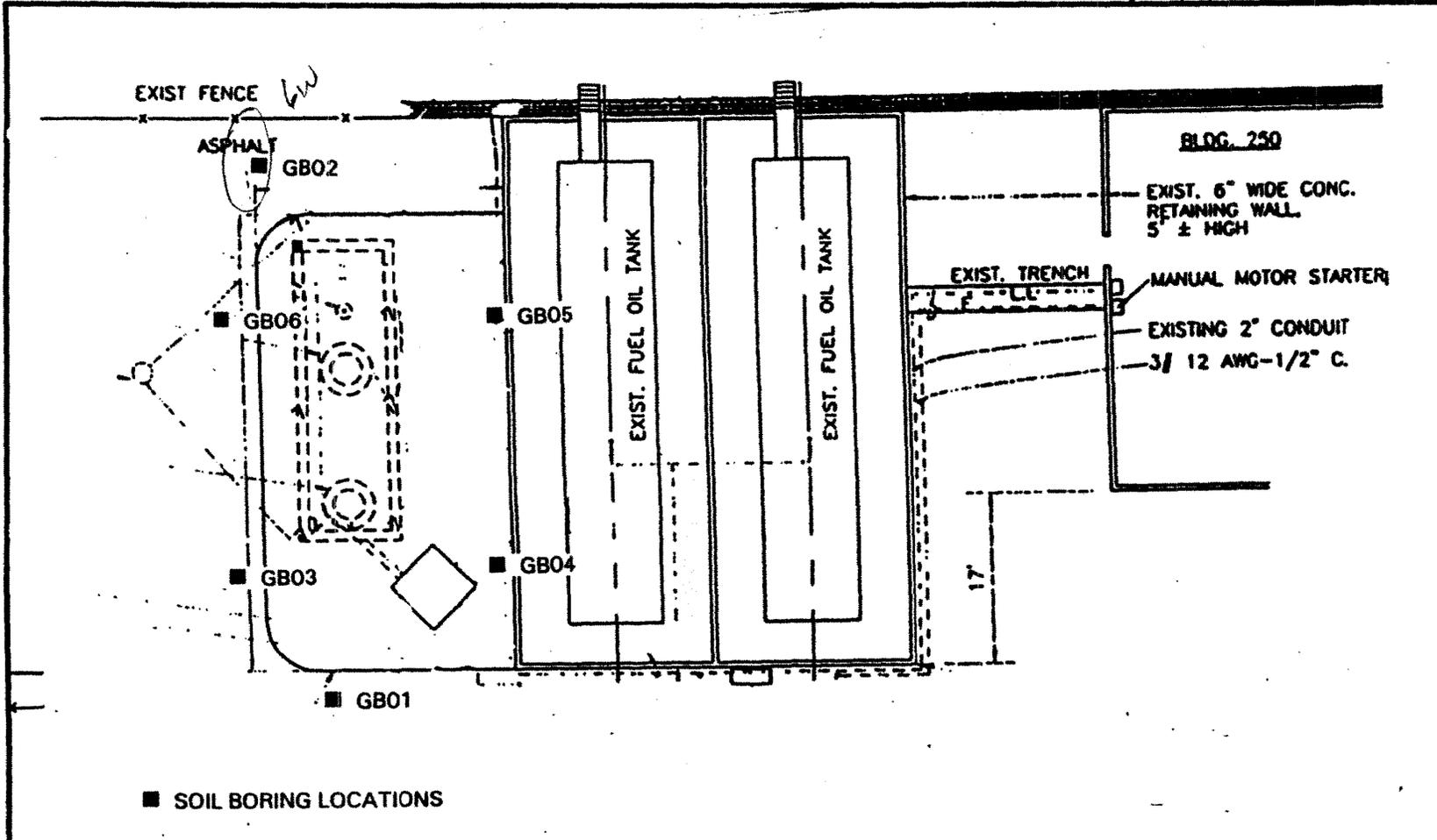
Analytical Results = ppb (ug/l)

Sample		Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE	Naphth.	Lead	TRPH
Location	Date								
0250-GW-GB01-001	3/15/99	<1.0	<2.5	<2.5	<5.0	<25	12	6.6	1200
0250-GW-GB02-001	3/15/99	<1.0	<1.0	<1.0	<2.0	<10	<10	5.0	11000
FDEP Target Levels		1.0	40.0	30.0	20.0	35.0	20.0	15.0	5000.0

**TABLE 3: SOIL ANALYTICAL SUMMARY**

Facility Name: UST Site 250, Naval Station Mayport

Sample		Benzene	Toluene	Ethyl Benzene	TRPH	Naph.
Location	Date					
0250-SS-GB01-0406	3/15/99	<1.1	<1.1	<1.1	5100.0	8.00
0250-SS-GB02-0406	3/15/99	<0.005	<0.005	<0.005	18.0	<0.37
0250-SS-GB03-0406	3/15/99	<1.2	<1.2	<1.2	6500.0	17.00
0250-SS-GB04-0406	3/15/99	<0.54	<0.540	<0.54	6700.0	<3.6
FDEP Target Levels		1.50	2000.0	240.0	2500.0	8600.00



DRAWN BY HJP 12/28/98 CHECKED BY DATE COST/SCHED-AREA SCALE AS NOTED		SITE MAP	CONTRACT NO.	
APPROVED BY DATE				
APPROVED BY DATE				
DRAWING NO.			FIGURE 1	REV. 0

**ATTACHMENT 1**  
**Lithologic borings**

# LOG OF BORING GB01

Page 1 of 1

PROJECT NO: 7867-DC	PROJECT NAME: VST SITE 250
PROJECT LOCATION: VST SITE 250	DATE DRILLED: 3-15-99 / 1130-1215
DRILLING COMPANY: PATRIDGE	SURFACE ELEVATION: Feet
DRILLING METHOD: DPT	BORING DIAMETER: Inches
DRILLING RIG: DPT	GEOLOGIST: A. OSESANKO

DEPTH feet	SAMPLE NUMBER	BLOWS/FT.	PID (ppm)				GRAPHIC LOG	USCS/ROD	GEOLOGIC DESCRIPTION Density/Consistency, Hardness, Color	WELL DIAGRAM
			Sample	B. Zone	Borehole	DR# B. Z.				
0-2					0	TOTAL				
2-4	SH				50	40			1.5'	
4-6	SS				0	>1000				
10									10'	
15										
20										
25										
30										
35										
40										

1.5' *limb rock (unconsolidated); full*  
 brown/dark brown fm/med grain.  
 sand, subangular  
 ↓  
 10' *borehole terminated @ 10ft hls*  
*soil sample collected for lab analysis*  
*from boring interval of 4-6 ft hls*  
*Sample ID is 0250-SS-GB01-0406*  
  
*Groundwater sample collected*  
*from pre-packed temp well for*  
*lab analysis. Sample ID is:*  
*0250-GW-GB01-001*



# LOG OF BORING GB03

PROJECT NO: 7867.DC	PROJECT NAME: UST SITE 250
PROJECT LOCATION: UST SITE 250	DATE DRILLED: 3-15-99 / 1255-1310
DRILLING COMPANY: PARADIGM	SURFACE ELEVATION: Feet
DRILLING METHOD: DPT	BORING DIAMETER: Inches
DRILLING RIG: DPT	GEOLOGIST: R. OFSANKU

DEPTH feet	SAMPLE NUMBER	BLOWS/FT.	PID (DDM)				GRAPHIC LOG	USCS/ROD	GEOLOGIC DESCRIPTION Density/Consistency, Hardness, Color	WELL DIAGRAM
			Sample	B. Zone	Borehole	Drill B. Z.				
0-2					2 2	0		dark organic rich top soil ↓		
2-4					250 0	250		brown/dark brown fm/med gr. sand, subangular ↓		
4-6					>1000 0	>1000		7' borehole terminated @ 7 ft bls		
10								Soil sample collected for lab analysis from boring interval 4-6 ft bls. Sample ID is: 0250-SS-GB03-0406		
15										
20										
25										
30										
35										
40										

# LOG OF BORING GB04

Page 1 of 1

PROJECT NO: 7867-DC	PROJECT NAME: UST SITE 250
PROJECT LOCATION: UST SITE 250	DATE DRILLED: 3.15.99 / 1335-1410
DRILLING COMPANY: PARTRIDGE	SURFACE ELEVATION: Feet
DRILLING METHOD: DPT	BORING DIAMETER: Inches
DRILLING RIG: DPT	GEOLOGIST: R. OFSANKO

DEPTH feet	SAMPLE NUMBER	BLOWS/FT.	PID (ppm)				GRAPHIC LOG	USCS/ROD	GEOLOGIC DESCRIPTION Density/Consistency, Hardness, Color	WELL DIAGRAM
			Sample	B. Zone	Borehole	Drill B. Z.				
0-2				-	0	TOTL 0		brown/dark brown fm/med grain. quartz sand, subangular ↓ - borehole terminated @ 7 ft bls.  Soil sample collected for lab. analysis from boring interval 4-6 ft bls. Sample ID is: 0250-55-GB04-0406		
2-4				-	720	300				
4-6				-	340 40	300				

# LOG OF BORING GB05

Page 1 of 1

PROJECT NO: 7867. DC	PROJECT NAME: UST SITE 250
PROJECT LOCATION: UST SITE 250	DATE DRILLED: 3.15.99 / 1415 - 14 3/5
DRILLING COMPANY: PARTRIDGE	SURFACE ELEVATION: Feet
DRILLING METHOD: DPT	BORING DIAMETER: Inches
DRILLING RIG: DPT	GEOLOGIST: R. OFSANKO

DEPTH feet	SAMPLE NUMBER	BLOWS/FT.	PID (ppm)				GRAPHIC LOG	USCS/ROD	GEOLOGIC DESCRIPTION Density/Consistency, Hardness, Color	WELL DIAGRAM
			Sample	B. Zone	Borehole	DR# B. Z.				
0-2					010	TOTAL		brown/dark brown f/med grain quartz sand, subangular ↓ -7' borehole terminated @ 7 ft bls.		
2-4					010					
4-6					010					
5										
10										
15										
20										
25										
30										
35										
40										

# LOG OF BORING GB06

Page 1 of

PROJECT NO: 7867.DC

PROJECT NAME: UST SITE 250

PROJECT LOCATION: UST SITE 250

DATE DRILLED: 3.15.99 / 1500 - 1530

DRILLING COMPANY: PARTRIDGE

SURFACE ELEVATION: Feet

DRILLING METHOD: DPT

BORING DIAMETER: Inches

DRILLING RIG: DPT

GEOLOGIST: R. OFSANKO

DEPTH feet	SAMPLE NUMBER	BLONS/FT.	PID (ppm)				GRAPHIC LOG	USCS/ROD	GEOLOGIC DESCRIPTION Density/Consistency, Hardness, Color	WELL DIAGRAM
			Sample	B. Zone	Borehole	Drill B. Z.				
0-2	0-2			1	0	TOTAL		brown/dark brown fm/med gr. quartz sand  - borehole terminated @ 7' bl.		
2-4	2-4			1	0					
4-6	4-6			1	2/30	10				
5										
10										
15										
20										
25										
30										
35										
40										

**ATTACHMENT 2**  
**Copies of Laboratory Analytical Results**

10/10/2018 10:10:10 AM 10/10/2018 10:10:10 AM 10/10/2018 10:10:10 AM

10/10/2018 10:10:10 AM 10/10/2018 10:10:10 AM 10/10/2018 10:10:10 AM

**SL SAVANNAH LABORATORIES**  
 & ENVIRONMENTAL SERVICES, INC.

2846 Industrial Plaza Drive (32301) • P.O. Box 13056 • Tallahassee, FL 32317-3056 • (850) 878-3994 • Fax (850) 878-9504

LOG NO: T9-30774  
 Received: 16 MAR 99  
 Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
 Tetra Tech NUS, Inc.  
 794 South Military Drive  
 Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
 Sampled By: RO  
 Code: 160190324

REPORT OF RESULTS

Page 1

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-1	0250-GW-GB01-001	03-15-99/1215	TTN004
30774-2	0250-GW-GB02-001	03-15-99/1255	TTN004
PARAMETER		30774-1	30774-2
Volatiles by GC/MS (8260)			
Benzene, ug/l		<1.0*J	<1.0
Bromodichloromethane, ug/l		<2.5*F65	<1.0
Bromoform, ug/l		<2.5*F65	<1.0
Bromomethane, ug/l		<2.5*F65	<1.0
Carbon tetrachloride, ug/l		<2.5*F65	<1.0
Chlorobenzene, ug/l		<2.5*F65	<1.0
Chloroethane, ug/l		<2.5*F65	<1.0
Chloroform, ug/l		<2.5*F65	<1.0
Chloromethane, ug/l		<2.5*F65	<1.0
Dibromochloromethane, ug/l		<2.5*F65	<1.0
1,1-Dichloroethane, ug/l		<2.5*F65	<1.0
1,2-Dichloroethane, ug/l		<2.5*F65	<1.0
1,1-Dichloroethene, ug/l		<2.5*F65	<1.0
cis-1,2-Dichloroethene, ug/l		<2.5*F65	<1.0
trans-1,2-Dichloroethylene, ug/l		<2.5*F65	<1.0
cis-1,3-Dichloropropene, ug/l		<2.5*F65	<1.0
trans-1,3-Dichloropropene, ug/l		<2.5*F65	<1.0
Ethylbenzene, ug/l		<2.5*F65	<1.0
Methylene chloride (Dichloromethane), ug/l		<5*J	<5.0
1,1,2,2-Tetrachloroethane, ug/l		<2.5*F65	<1.0
Tetrachloroethene, ug/l		<2.5*F65	<1.0
Toluene, ug/l		<2.5*F65	<1.0
1,1,1-Trichloroethane, ug/l		<2.5*F65	<1.0
1,1,2-Trichloroethane, ug/l		<2.5*F65	<1.0

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LOG NO: T9-30774  
Received: 16 MAR 99  
Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204(SS)

Project: VST Site 250/Bravo Pier-Mayport

Sampled By: RO  
Code: 182590322

Page 2

## REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-1	0250-GW-GB01-001	03-15-99/1215	TTN004
30774-2	0250-GW-GB02-001	03-15-99/1255	TTN004
PARAMETER		30774-1	30774-2
Vinyl chloride, ug/l		<2.5*F65	<1.0
Surrogate - Toluene-d8		101 %	98 %
Surrogate - 4-Bromofluorobenzene		106 %	102 %
Surrogate - Dibromofluoromethane		108 %	106 %
2-Chloroethylvinyl Ether, ug/l		<25	<10
Acrolein, ug/l		<50	<20
Acrylonitrile, ug/l		<50	<20
Xylenes, ug/l		<5.0*F65	<2.0
Methyl tert-butyl ether (MTBE), ug/l		<25*F65	<10
Analyst		MTM	MTM
Analysis Date		03.18.99	03.18.99
Batch ID		0315M	0315M
Dilution Factor		2.5	1.0
NIST Library Search (VOC)		Attached	Attached

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Mr. Arnold Lamb, QA Officer  
 Tetra Tech NUS, Inc.  
 794 South Military Drive  
 Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
 Sampled By: RO  
 Code: 175990319

REPORT OF RESULTS

Page 3

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-1	0250-GW-GB01-001	03-15-99/1215	TTN004
30774-2	0250-GW-GB02-001	03-15-99/1255	TTN004
PARAMETER		30774-1	30774-2
Semivolatile Organics (8270)			
1,3-Dichlorobenzene, ug/l		<10	<10
1,4-Dichlorobenzene, ug/l		<10	<10
Hexachloroethane, ug/l		<10	<10
bis(2-Chloroethyl)ether, ug/l		<10	<10
1,2-Dichlorobenzene, ug/l		<10	<10
bis(2-Chloroisopropyl)ether, ug/l		<10	<10
n-Nitrosodi-n-propylamine, ug/l		<10	<10
Nitrobenzene, ug/l		<10	<10
Hexachlorobutadiene, ug/l		<10	<10
1,2,4-Trichlorobenzene, ug/l		<10	<10
Isophorone, ug/l		<10	<10
Naphthalene, ug/l		12	<10
bis(2-Chloroethoxy)methane, ug/l		<10	<10
Hexachlorocyclopentadiene, ug/l		<10	<10
2-Chloronaphthalene, ug/l		<10	<10
Acenaphthylene, ug/l		<10	<10
Acenaphthene, ug/l		<10	<10
Dimethylphthalate, ug/l		<10	<10
2,6-Dinitrotoluene, ug/l		<10	<10
Fluorene, ug/l		<10	<10
4-Chlorophenylphenyl ether, ug/l		<10	<10
2,4-Dinitrotoluene, ug/l		<10	<10
Diethylphthalate, ug/l		<10	<10
N-Nitrosodiphenylamine/Diphenylamine, ug/l		<10	<10

**Note:**

Semi-volatile organics were analyzed by EPA Method 8270 to detect the target compounds within the Priority Pollutant List. A result of using Method 8270 is that some of the semi-volatile compounds could not be reported at detection limits below the FDEP Groundwater Target Cleanup Levels. Specifically, the following compounds had to be reported at a detection limit of 10 µg/L: Chrysene, benzo (a) anthracene, benzo (b) fluoranthene, benzo (k) flouranthene, benzo (a) pyrene, indeno (1,2,3-cd) pyrene, and dibenzo (a,h) anthracene. The laboratory has re-evaluated the data from the mass spectrometer and concluded that none of these compounds were identified, but detection limits could not be lowered for the compounds.

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LOG NO: T9-30774  
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 Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
 Tetra Tech NUS, Inc.  
 794 South Military Drive  
 Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204(SS)

Project: VST Site 250/Bravo Pier-Mayport  
 Sampled By: RO  
 Code: 175990319

REPORT OF RESULTS

Page 4

LOG NO	SAMPLE DESCRIPTION, LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-1	0250-GW-GB01-001	03-15-99/1215	TTN004
30774-2	0250-GW-GB02-001	03-15-99/1255	TTN004
PARAMETER		30774-1	30774-2
Hexachlorobenzene, ug/l		<10	<10
4-Bromophenyl phenyl ether, ug/l		<10	<10
Phenanthrene, ug/l		<10	<10
Anthracene, ug/l		<10	<10
Di-n-butylphthalate, ug/l		<10	<10
Fluoranthene, ug/l		<10	<10
Pyrene, ug/l		<10	<10
Benzidine, ug/l		<80	<80
Butylbenzylphthalate, ug/l		<10	<10
bis(2-Ethylhexyl)phthalate, ug/l		<10	<10
* Chrysene, ug/l — 5		<10	<10
* Benzo (a) anthracene, ug/l — 0.2		<10	<10
3,3'-Dichlorobenzidine, ug/l		<20	<20
Di-n-octylphthalate, ug/l		<10	<10
* Benzo (b) fluoranthene, ug/l — 0.2		<10	<10
* Benzo (k) fluoranthene, ug/l — 0.5		<10	<10
* Benzo (a) pyrene, ug/l — 0.2		<10	<10
* Indeno (1,2,3-cd) pyrene, ug/l — 0.2		<10	<10
* Dibenzo (a,h) anthracene, ug/l — 0.2		<10	<10
Benzo (g,h,i) perylene, ug/l		<10	<10
N-Nitrosodimethylamine, ug/l		<10	<10
2-Chlorophenol, ug/l		<10	<10
2-Nitrophenol, ug/l		<10	<10
Phenol, ug/l		<10	<10
2,4-Dimethylphenol, ug/l		<10	<10

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## REPORT OF RESULTS

Page 5

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30774-1	0250-GW-GB01-001	03-15-99/1215	TTM004
30774-2	0250-GW-GB02-001	03-15-99/1255	TTM004
PARAMETER		30774-1	30774-2
2,4-Dichlorophenol, ug/l		<10	<10
2,4,6-Trichlorophenol, ug/l		<10	<10
4-Chloro-3-methylphenol, ug/l		<10	<10
2,4-Dinitrophenol, ug/l		<50	<50
2-Methyl-4,6-dinitrophenol, ug/l		<50	<50
Pentachlorophenol, ug/l		<50	<50
4-Nitrophenol, ug/l		<50	<50
1,2-Diphenylhydrazine, ug/l		<10	<10
Surrogate - 2-Fluorophenol		68 %	69 %
Surrogate - Phenol d5		70 %	71 %
Surrogate - Nitrobenzene - d5		78 %	78 %
Surrogate - 2-Fluorobiphenyl		66 %	50 %
Surrogate - 2,4,6-Tribromophenol		99 %	73 %
Surrogate - Terphenyl - d14		39 %	28 %
Prep Date		03.16.99	03.16.99
Analyst		PS	PS
Analysis Date		03.18.99	03.18.99
Batch ID		0316H	0316A
Dilution Factor		1.0	1.0
NIST Library Search (BN/A)		Attached	Attached

# SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

2846 Industrial Plaza Drive (32301) • P.O. Box 13056 • Tallahassee, FL 32317-3056 • (850) 878-3994 • Fax (850) 878-9504

LOG NO: T9-30774  
Received: 16 MAR 99  
Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 175990319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-1	0250-GW-GH01-001	03-15-99/1215	TTN004
30774-2	0250-GW-GH02-001	03-15-99/1255	TTN004
PARAMETER		30774-1	30774-2
<b>Petroleum Range Organics (FL-PRO)</b>			
Petroleum Hydrocarbons , mg/l		1.2	11
Surrogate, o-Terphenyl		79 %	*F36
Surrogate-C39		88 %	73 %
Prep Date		03.16.99	03.16.99
Analyst		BM	BM
Analysis Date		03.17.99	03.17.99
Batch ID		0316D	0316D
Dilution Factor		1.0	1.0
<b>RCRA Metals (6010)</b>			
Arsenic, mg/l		<0.010	<0.010
Barium, mg/l		0.025	0.030
Cadmium, mg/l		<0.0050	<0.0050
Chromium, mg/l		0.017	0.013
Lead, mg/l		0.0066	<0.0050
Selenium, mg/l		<0.010	<0.010
Silver, mg/l		<0.010	<0.010
Prep Date		03.16.99	03.16.99
Analyst		CLD	CLD
Analysis Date		03.17.99	03.17.99
Batch ID		0316J	0316J
Dilution Factor		1.0	1.0

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Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

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Project: VST Site 250/Bravo Pier-Mayport  
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Code: 175990319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-1	0250-GW-GB01-001	03-15-99/1215	TTN004
30774-2	0250-GW-GB02-001	03-15-99/1255	TTN004
PARAMETER		30774-1	30774-2
<b>Mercury (7470)</b>			
Mercury, mg/l		<0.00020	<0.00020
Prep Date		03.16.99	03.16.99
Analyst		KW	KW
Analysis Date		03.17.99	03.17.99
Batch ID		0316U	0316U
Dilution Factor		1.0	1.0
<b>TCLP extraction - non-volatile (1311)</b>			
TCLP Extraction Date		03.16.99	03.16.99
Prep Date		03.16.99	03.16.99
Analyst		BP	BP
Batch ID		0316T	0316T
<b>Metals in TCLP Extract (6010)</b>			
Arsenic (TCLP-6010), mg/l		<0.20	<0.20
Barium (TCLP-6010), mg/l		<1.0	<1.0
Cadmium (TCLP-6010), mg/l		<0.10	<0.10
Chromium (TCLP-6010), mg/l		<0.20	<0.20
Lead (TCLP-6010), mg/l		<0.20	<0.20
Selenium (TCLP-6010), mg/l		<0.50	<0.50
Silver (TCLP-6010), mg/l		<0.10	<0.10
Prep Date		03.18.99	03.18.99
Analyst		DWH	DWH
Analysis Date		03.18.99	03.18.99
Batch ID		03180	03180
Dilution Factor		1.0	1.0

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 Tetra Tech NUS, Inc.  
 794 South Military Drive  
 Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204(SS)

Project: VST Site 250/Bravo Pier-Mayport  
 Sampled By: RO  
 Code: 175990319

REPORT OF RESULTS

Page 8

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-1	0250-GW-GB01-001	03-15-99/1215	TTN004
30774-2	0250-GW-GB02-001	03-15-99/1255	TTN004
PARAMETER		30774-1	30774-2
Mercury in TCLP Extract (7470)			
Mercury, mg/l		<0.020	<0.020
Prep Date		03.17.99	03.17.99
Analyst		KW	KW
Analysis Date		03.17.99	03.17.99
Batch ID		0317X	0317X
Dilution Factor		100	100

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 794 South Military Drive  
 Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
 Sampled By: RO  
 Code: 182290319

REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-3	0250-SS-GB01-0406	03-15-99/1150	TTN004
30774-4	0250-SS-GB02-0406	03-15-99/1245	TTN004
30774-5	0250-SS-GB03-0406	03-15-99/1305	TTN004
30774-6	0250-SS-GB04-0406	03-15-99/1405	TTN004

PARAMETER	30774-3	30774-4	30774-5	30774-6
<b>Volatiles by GC/MS (8260)</b>				
Benzene, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
Bromodichloromethane, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
Bromoform, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
Bromomethane, ug/kg dw	<2200*F65	<10	<2400*F65	<1100*F65
Carbon tetrachloride, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
Chlorobenzene, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
Chloroethane, ug/kg dw	<2200*F65	<10	<2400*F65	<1100*F65
Chloroform, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
Chloromethane, ug/kg dw	<2200*F65	<10	<2400*F65	<1100*F65
Dibromochloromethane, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
1,1-Dichloroethane, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
1,2-Dichloroethane, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
1,1-Dichloroethene, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
cis-1,2-Dichloroethene, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
trans-1,2-Dichloroethylene, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
cis-1,3-Dichloropropene, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
trans-1,3-Dichloropropene, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
Ethylbenzene, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
Methylene chloride (Dichloromethane), ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
1,1,2,2-Tetrachloroethane, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
Tetrachloroethene, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65

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LOG NO: T9-30774  
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Mr. Arnold Lamb, QA Officer  
 Tetra Tech NUS, Inc.  
 794 South Military Drive  
 Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204(SS)

Project: VST Site 250/Bravo Pier-Mayport  
 Sampled By: RO  
 Code: 182390319

REPORT OF RESULTS

Page 10

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-3	0250-SS-GB01-0406	03-15-99/1150	TTN004
30774-4	0250-SS-GB02-0406	03-15-99/1245	TTN004
30774-5	0250-SS-GB03-0406	03-15-99/1305	TTN004
30774-6	0250-SS-GB04-0406	03-15-99/1405	TTN004

PARAMETER	30774-3	30774-4	30774-5	30774-6
Toluene, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
1,1,1-Trichloroethane, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
1,1,2-Trichloroethane, ug/kg dw	<1100*F65	<5.0	<1200*F65	<540*F65
Vinyl chloride, ug/kg dw	<2200*F65	<10	<2400*F65	<1100*F65
2-Chloroethylvinyl Ether, ug/kg dw	<11000*F65	<50	<12000*F65	<5400*F65
Acrolein, ug/kg dw	<22000*F65	<100	<24000*F65	<11000*F65
Acrylonitrile, ug/kg dw	<22000*F65	<100	<24000*F65	<11000*F65
Surrogate - Toluene-d8	102 %	101 %	101 %	102 %
Surrogate - 4-Bromofluorobenzene	113 %	101 %	108 %	103 %
Surrogate - Dibromofluoromethane	129 %	127 %	128 %	128 %
Analyst	WHE	WHE	WHE	WHE
Analysis Date	03.19.99	03.19.99	03.19.99	03.19.99
Batch ID	0315N	0315N	0315N	0315N
Dilution Factor	200	1.0	200	100
NIST Library Search (VOC)	Attached	Attached	Attached	Attached

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Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport

Sampled By: RO  
Code: 175990319

REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED	SDC#	
30774-3	0250-SS-GB01-0406	03-15-99/1150	TTN004	
30774-4	0250-SS-GB02-0406	03-15-99/1245	TTN004	
30774-5	0250-SS-GB03-0406	03-15-99/1305	TTN004	
30774-6	0250-SS-GB04-0406	03-15-99/1405	TTN004	
PARAMETER	30774-3	30774-4	30774-5	30774-6
Semivolatile Organics (8270)				
1,3-Dichlorobenzene, ug/kg dw	<3700	<370	<3800	<3600*F65
1,4-Dichlorobenzene, ug/kg dw	<3700	<370	<3800	<3600*F65
Hexachloroethane, ug/kg dw	<3700	<370	<3800	<3600*F65
bis(2-Chloroethyl)ether, ug/kg dw	<3700	<370	<3800	<3600*F65
1,2-Dichlorobenzene, ug/kg dw	<3700	<370	<3800	<3600*F65
bis(2-Chloroisopropyl)ether, ug/kg dw	<3700	<370	<3800	<3600*F65
n-Nitrosodi-n-propylamine, ug/kg dw	<3700	<370	<3800	<3600*F65
Nitrobenzene, ug/kg dw	<3700	<370	<3800	<3600*F65
Hexachlorobutadiene, ug/kg dw	<3700	<370	<3800	<3600*F65
1,2,4-Trichlorobenzene, ug/kg dw	<3700	<370	<3800	<3600*F65
Isophorone, ug/kg dw	<3700	<370	<3800	<3600*F65
Naphthalene, ug/kg dw	8000	<370	17000	<3600*F65
bis(2-Chloroethoxy)methane, ug/kg dw	<3700	<370	<3800	<3600*F65
Hexachlorocyclopentadiene, ug/kg dw	<3700	<370	<3800	<3600*F65
2-Chloronaphthalene, ug/kg dw	<3700	<370	<3800	<3600*F65
Acenaphthylene, ug/kg dw	<3700	<370	<3800	<3600*F65
Acenaphthene, ug/kg dw	<3700	<370	<3800	<3600*F65
Dimethylphthalate, ug/kg dw	<3700	<370	<3800	<3600*F65
2,6-Dinitrotoluene, ug/kg dw	<3700	<370	<3800	<3600*F65
Fluorene, ug/kg dw	4300	<370	<3800	<3600*F65
4-Chlorophenylphenyl ether, ug/kg dw	<3700	<370	<3800	<3600*F65
2,4-Dinitrotoluene, ug/kg dw	<3700	<370	<3800	<3600*F65

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LOG NO: T9-30774  
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Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 175990319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED	SDG#	
30774-3	0250-SS-GB01-0406	03-15-99/1150	TTN004	
30774-4	0250-SS-GB02-0406	03-15-99/1245	TTN004	
30774-5	0250-SS-GB03-0406	03-15-99/1305	TTN004	
30774-6	0250-SS-GB04-0406	03-15-99/1405	TTN004	
PARAMETER	30774-3	30774-4	30774-5	30774-6
Diethylphthalate, ug/kg dw	<3700	<370	<3800	<3600*F65
N-Nitrosodiphenylamine/Diphenylamine, ug/kg dw	<3700	<370	<3800	<3600*F65
Hexachlorobenzene, ug/kg dw	<3700	<370	<3800	<3600*F65
4-Bromophenyl phenyl ether, ug/kg dw	<3700	<370	<3800	<3600*F65
Phenanthrene, ug/kg dw	4800	<370	11000	<3600*F65
Anthracene, ug/kg dw	<3700	<370	<3800	<3600*F65
Di-n-butylphthalate, ug/kg dw	<3700	<370	<3800	<3600*F65
Fluoranthene, ug/kg dw	<3700	<370	<3800	<3600*F65
Pyrene, ug/kg dw	<3700	<370	<3800	<3600*F65
Benzidine, ug/kg dw	<31000	<3000	<31000	<29000*F65
Butylbenzylphthalate, ug/kg dw	<3700	<370	<3800	<3600*F65
bis(2-Ethylhexyl)phthalate, ug/kg dw	<3700	<370	<3800	<3600*F65
Chrysene, ug/kg dw	<3700	<370	<3800	<3600*F65
Benzo(a)anthracene, ug/kg dw	<3700	<370	<3800	<3600*F65
3,3'-Dichlorobenzidine, ug/kg dw	<7500	<730	<7700	<7200*F65
Di-n-octylphthalate, ug/kg dw	<3700	<370	<3800	<3600*F65
Benzo(b)fluoranthene, ug/kg dw	<3700	<370	<3800	<3600*F65
Benzo(k)fluoranthene, ug/kg dw	<3700	<370	<3800	<3600*F65
Benzo(a)pyrene, ug/kg dw	<3700	<370	<3800	<3600*F65
Indeno(1,2,3-cd)pyrene, ug/kg dw	<3700	<370	<3800	<3600*F65
Dibenzo(a,h)anthracene, ug/kg dw	<3700	<370	<3800	<3600*F65
Benzo(g,h,i)perylene, ug/kg dw	<3700	<370	<3800	<3600*F65

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LOG NO: T9-30774  
Received: 16 MAR 99  
Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 182590322

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-3	0250-SS-GB01-0406	03-15-99/1150	TTN004
30774-4	0250-SS-GB02-0406	03-15-99/1245	TTN004
30774-5	0250-SS-GB03-0406	03-15-99/1305	TTN004
30774-6	0250-SS-GB04-0406	03-15-99/1405	TTN004

PARAMETER	30774-3	30774-4	30774-5	30774-6
N-Nitrosodimethylamine, ug/kg dw	<3700	<370	<3800	<3600*F65
2-Chlorophenol, ug/kg dw	<3700	<370	<3800	<3600*F65
2-Nitrophenol, ug/kg dw	<3700	<370	<3800	<3600*F65
Phenol, ug/kg dw	<3700	<370	<3800	<3600*F65
2,4-Dimethylphenol, ug/kg dw	<3700	<370	<3800	<3600*F65
2,4-Dichlorophenol, ug/kg dw	<3700	<370	<3800	<3600*F65
2,4,6-Trichlorophenol, ug/kg dw	<3700	<370	<3800	<3600*F65
4-Chloro-3-methylphenol, ug/kg dw	<3700	<370	<3800	<3600*F65
2,4-Dinitrophenol, ug/kg dw	<19000	<1900	<20000	<19000*F65
2-Methyl-4,6-dinitrophenol, ug/kg dw	<19000	<1900	<20000	<19000*F65
Pentachlorophenol, ug/kg dw	<19000	<1900	<20000	<19000*F65
4-Nitrophenol, ug/kg dw	<19000	<1900	<20000	<19000*F65
1,2-Diphenylhydrazine, ug/kg dw	<3700	<370	<3800	<3600*F65
Surrogate - 2-Fluorophenol	*F33	46 †	*F33	*F33
Surrogate - Phenol d5	*F33	49 †	*F33	*F33
Surrogate - Nitrobenzene - d5	*F33	45 †	*F33	*F33
Surrogate - 2-Fluorobiphenyl	*F33	47 †	*F33	*F33
Surrogate - 2,4,6-Tribromophenol	*F33	60 †	*F33	*F33
Surrogate - Terphenyl - d14	*F33	59 †	*F33	*F33
Prep Date	03.16.99	03.16.99	03.16.99	03.16.99
Analyst	PS	PS	PS	PS
Analysis Date	03.17.99	03.18.99	03.18.99	03.18.99
Batch ID	0316H	0316H	0316H	0316H
Dilution Factor	10	1.0	10	10
NIST Library Search (BN/A)	Attached	Attached	Attached	Attached

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Mr. Arnold Lamb, QA Officer  
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794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204(SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 175990319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED	SDG#	
30774-3	0250-SS-GB01-0406	03-15-99/1150	TTN004	
30774-4	0250-SS-GB02-0406	03-15-99/1245	TTN004	
30774-5	0250-SS-GB03-0406	03-15-99/1305	TTN004	
30774-6	0250-SS-GB04-0406	03-15-99/1405	TTN004	
PARAMETER	30774-3	30774-4	30774-5	30774-6
<b>Petroleum Range Organics (FL-PRO)</b>				
Petroleum Hydrocarbons , mg/kg dw	5100	18	6500	6700
Surrogate, o-Terphenyl	*F33	43 %	*F33	*F33
Surrogate-C39	*F33	92 %	*F33	*F33
Prep Date	03.16.99	03.16.99	03.16.99	03.16.99
Analyst	BM	BM	BM	BM
Analysis Date	03.17.99	03.17.99	03.17.99	03.17.99
Batch ID	0316I	0316I	0316I	0316I
Dilution Factor	20	1.0	40	40
<b>RCRA Metals (6010)</b>				
Arsenic, mg/kg dw	<1.0	<1.0	<1.0	<1.0
Barium, mg/kg dw	9.1	5.4	7.0	1.5
Cadmium, mg/kg dw	<0.50	<0.50	<0.50	<0.50
Chromium, mg/kg dw	2.1	2.6	1.8	<1.0
Lead, mg/kg dw	4.4	7.2	1.1	1.3
Selenium, mg/kg dw	<1.0	<1.0	<1.0	<1.0
Silver, mg/kg dw	<1.0	<1.0	<1.0	<1.0
Prep Date	03.17.99	03.17.99	03.17.99	03.17.99
Analyst	CLD	CLD	CLD	CLD
Analysis Date	03.18.99	03.18.99	03.18.99	03.18.99
Batch ID	0317C	0317C	0317C	0317C
Dilution Factor	1.0	1.0	1.0	1.0

# SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

2846 Industrial Plaza Drive (32301) • P.O. Box 13056 • Tallahassee, FL 32317-3056 • (850) 878-3994 • Fax (850) 878-9504

LOG NO: T9-30774  
Received: 16 MAR 99  
Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-999204(SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 175990319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-3	0250-SS-GB01-0406	03-15-99/1150	TTN004
30774-4	0250-SS-GB02-0406	03-15-99/1245	TTN004
30774-5	0250-SS-GB03-0406	03-15-99/1305	TTN004
30774-6	0250-SS-GB04-0406	03-15-99/1405	TTN004

PARAMETER	30774-3	30774-4	30774-5	30774-6
Mercury (7471)				
Mercury, mg/kg dw	<0.020	<0.020	0.027	<0.020
Prep Date	03.17.99	03.17.99	03.17.99	03.17.99
Analyst	KW	KW	KW	KW
Analysis Date	03.17.99	03.17.99	03.17.99	03.17.99
Batch ID	0317R	0317R	0317R	0317R
Dilution Factor	1.0	1.0	1.0	1.0
TCLP extraction - non-volatile (1311)				
TCLP Extraction Date	03.16.99	03.16.99	03.16.99	03.16.99
Prep Date	03.16.99	03.16.99	03.16.99	03.16.99
Analyst	BP	BP	BP	BP
Batch ID	0316T	0316T	0316T	0316T
Metals in TCLP Extract (6010)				
Arsenic (TCLP-6010), mg/l	<0.20	<0.20	<0.20	<0.20
Barium (TCLP-6010), mg/l	<1.0	<1.0	<1.0	<1.0
Cadmium (TCLP-6010), mg/l	<0.10	<0.10	<0.10	<0.10
Chromium (TCLP-6010), mg/l	<0.20	<0.20	<0.20	<0.20
Lead (TCLP-6010), mg/l	<0.20	<0.20	<0.20	<0.20
Selenium (TCLP-6010), mg/l	<0.50	<0.50	<0.50	<0.50
Silver (TCLP-6010), mg/l	<0.10	<0.10	<0.10	<0.10
Prep Date	03.18.99	03.18.99	03.18.99	03.18.99
Analyst	DWH	DWH	DWH	DWH
Analysis Date	03.18.99	03.18.99	03.18.99	03.18.99
Batch ID	03180	03180	03180	03180
Dilution Factor	1.0	1.0	1.0	1.0

**SL SAVANNAH LABORATORIES**  
 & ENVIRONMENTAL SERVICES. INC.

2846 Industrial Plaza Drive (32301) • P.O. Box 13056 • Tallahassee, FL 32317-3056 • (850) 878-3994 • Fax (850) 878-9504

LOG NO: T9-30774  
 Received: 16 MAR 99  
 Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
 Tetra Tech NUS, Inc.  
 794 South Military Drive  
 Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
 Sampled By: RO  
 Code: 182290319  
 Page 16

REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED	SDG#	
30774-3	0250-SS-GB01-0406	03-15-99/1150	TTN004	
30774-4	0250-SS-GB02-0406	03-15-99/1245	TTN004	
30774-5	0250-SS-GB03-0406	03-15-99/1305	TTN004	
30774-6	0250-SS-GB04-0406	03-15-99/1405	TTN004	
PARAMETER	30774-3	30774-4	30774-5	30774-6
Mercury in TCLP Extract (7470)				
Mercury, mg/l	<0.020	<0.020	<0.020	<0.020
Prep Date	03.17.99	03.17.99	03.17.99	03.17.99
Analyst	KW	KW	KW	KW
Analysis Date	03.17.99	03.17.99	03.17.99	03.17.99
Batch ID	0317X	0317X	0317X	0317X
Dilution Factor	100	100	100	100
Percent Solids	87	94	82	93

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LOG NO: T9-30774  
Received: 16 MAR 99  
Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204(SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 182590322

## REPORT OF RESULTS

Page 17

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-7	Method Blank		TTN004
30774-8	Lab Control Standard Result		TTN004
30774-9	Lab Control Standard Duplicate Result		TTN004
30774-10	Expected Value, LCS/LCSD		TTN004
30774-11	Lab Control Standard % Recovery		TTN004

PARAMETER	30774-7	30774-8	30774-9	30774-10	30774-11
Volatiles by GC/MS (8260)					
Benzene, ug/l	<1.0	9.41	9.40	10.0	94 %
Bromodichloromethane, ug/l	<1.0	---	---	---	---
Bromoform, ug/l	<1.0	---	---	---	---
Bromomethane, ug/l	<1.0	---	---	---	---
Carbon tetrachloride, ug/l	<1.0	---	---	---	---
Chlorobenzene, ug/l	<1.0	10.7	11.0	10.0	107 %
Chloroethane, ug/l	<1.0	---	---	---	---
Chloroform, ug/l	<1.0	---	---	---	---
Chloromethane, ug/l	<1.0	---	---	---	---
Dibromochloromethane, ug/l	<1.0	---	---	---	---
1,1-Dichloroethane, ug/l	<1.0	---	---	---	---
1,2-Dichloroethane, ug/l	<1.0	---	---	---	---
1,1-Dichloroethene, ug/l	<1.0	7.01	7.10	10.0	70 %
cis-1,2-Dichloroethene, ug/l	<1.0	---	---	---	---
trans-1,2-Dichloroethylene, ug/l	<1.0	---	---	---	---
cis-1,3-Dichloropropene, ug/l	<1.0	---	---	---	---
trans-1,3-Dichloropropene, ug/l	<1.0	---	---	---	---
Ethylbenzene, ug/l	<1.0	---	---	---	---
Methylene chloride (Dichloromethane), ug/l	<5.0	---	---	---	---
1,1,2,2-Tetrachloroethane, ug/l	<1.0	---	---	---	---

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LOG NO: T9-30774  
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Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 175990319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-7	Method Blank		TTN004
30774-8	Lab Control Standard Result		TTN004
30774-9	Lab Control Standard Duplicate Result		TTN004
30774-10	Expected Value, LCS/LCSD		TTN004
30774-11	Lab Control Standard % Recovery		TTN004

PARAMETER	30774-7	30774-8	30774-9	30774-10	30774-11
Volatiles by GC/MS (8260)					
Benzene, ug/l	<5.0	9.41	9.40	10.0	94 %
Bromodichloromethane, ug/l	<5.0	---	---	---	---
Bromoform, ug/l	<5.0	---	---	---	---
Bromomethane, ug/l	<10	---	---	---	---
Carbon tetrachloride, ug/l	<5.0	---	---	---	---
Chlorobenzene, ug/l	<5.0	10.7	11.0	10.0	107 %
Chloroethane, ug/l	<10	---	---	---	---
Chloroform, ug/l	<5.0	---	---	---	---
Chloromethane, ug/l	<10	---	---	---	---
Dibromochloromethane, ug/l	<5.0	---	---	---	---
1,1-Dichloroethane, ug/l	<5.0	---	---	---	---
1,2-Dichloroethane, ug/l	<5.0	---	---	---	---
1,1-Dichloroethane, ug/l	<5.0	7.01	7.10	10.0	70 %
cis-1,2-Dichloroethene, ug/l	<5.0	---	---	---	---
trans-1,2-Dichloroethylene, ug/l	<5.0	---	---	---	---
cis-1,3-Dichloropropene, ug/l	<5.0	---	---	---	---
trans-1,3-Dichloropropene, ug/l	<5.0	---	---	---	---
Ethylbenzene, ug/l	<5.0	---	---	---	---
Methylene chloride (Dichloromethane), ug/l	<5.0	---	---	---	---
1,1,2,2-Tetrachloroethane, ug/l	<5.0	---	---	---	---

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LOG NO: T9-30774  
Received: 16 MAR 99  
Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204(SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 182590322

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-7	Method Blank		TTN004
30774-8	Lab Control Standard Result		TTN004
30774-9	Lab Control Standard Duplicate Result		TTN004
30774-10	Expected Value, LCS/LCSD		TTN004
30774-11	Lab Control Standard % Recovery		TTN004

PARAMETER	30774-7	30774-8	30774-9	30774-10	30774-11
Tetrachloroethene, ug/l	<1.0	---	---	---	---
Toluene, ug/l	<1.0	9.82	9.63	10.0	98 %
1,1,1-Trichloroethane, ug/l	<1.0	---	---	---	---
1,1,2-Trichloroethane, ug/l	<1.0	---	---	---	---
Vinyl chloride, ug/l	<1.0	---	---	---	---
Surrogate - Toluene-d8	105 %	102 %	101 %	---	---
Surrogate - 4-Bromofluorobenzene	101 %	106 %	111 %	---	---
Surrogate - Dibromofluoromethane	119 %	118 %	115 %	---	---
2-Chloroethylvinyl Ether, ug/l	<10	---	---	---	---
Acrolein, ug/l	<20	---	---	---	---
Acrylonitrile, ug/l	<20	---	---	---	---
Xylenes, ug/l	<2.0	---	---	---	---
Methyl tert-butyl ether (MTBE), ug/l	<10	---	---	---	---
Trichloroethylene, %	---	11.2	11.3	10	112 %
Analyst	WHE	WHE	WHE	---	---
Analysis Date	03.17.99	03.16.99	03.16.99	---	---
Batch ID	0315N	0315M	0315M	---	---
Dilution Factor	1.0	1.0	1.0	---	---

# SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

2846 Industrial Plaza Drive (32301) • P.O. Box 13056 • Tallahassee, FL 32317-3056 • (850) 878-3994 • Fax (850) 878-9504

LOG NO: T9-30774  
Received: 16 MAR 99  
Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204(SB)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 175990319

## REPORT OF RESULTS

Page 19

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-7	Method Blank		TTN004
30774-8	Lab Control Standard Result		TTN004
30774-9	Lab Control Standard Duplicate Result		TTN004
30774-10	Expected Value, LCS/LCSD		TTN004
30774-11	Lab Control Standard % Recovery		TTN004

PARAMETER	30774-7	30774-8	30774-9	30774-10	30774-11
Semivolatile Organics (8270)					
1,3-Dichlorobenzene, ug/l	<10	---	---	---	---
1,4-Dichlorobenzene, ug/l	<10	23.0	25.5	50	46 %
Hexachloroethane, ug/l	<10	---	---	---	---
bis(2-Chloroethyl)ether, ug/l	<10	---	---	---	---
1,2-Dichlorobenzene, ug/l	<10	---	---	---	---
bis(2-Chloroisopropyl)ether, ug/l	<10	---	---	---	---
n-Nitrosodi-n-propylamine, ug/l	<10	31.5	33.8	50	63 %
Nitrobenzene, ug/l	<10	---	---	---	---
Hexachlorobutadiene, ug/l	<10	---	---	---	---
1,2,4-Trichlorobenzene, ug/l	<10	23.9	27.4	50	48 %
Isophorone, ug/l	<10	---	---	---	---
Naphthalene, ug/l	<10	---	---	---	---
bis(2-Chloroethoxy)methane, ug/l	<10	---	---	---	---
Hexachlorocyclopentadiene, ug/l	<10	---	---	---	---
2-Chloronaphthalene, ug/l	<10	---	---	---	---
Acenaphthylene, ug/l	<10	---	---	---	---
Acenaphthene, ug/l	<10	33.5	35.7	50	67 %
Dimethylphthalate, ug/l	<10	---	---	---	---
2,6-Dinitrotoluene, ug/l	<10	---	---	---	---
Fluorene, ug/l	<10	---	---	---	---
4-Chlorophenylphenyl ether, ug/l	<10	---	---	---	---

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Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204(SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 175990319

## REPORT OF RESULTS

Page 20

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-7	Method Blank		TTN004
30774-8	Lab Control Standard Result		TTN004
30774-9	Lab Control Standard Duplicate Result		TTN004
30774-10	Expected Value, LCS/LCSD		TTN004
30774-11	Lab Control Standard % Recovery		TTN004

PARAMETER	30774-7	30774-8	30774-9	30774-10	30774-11
2,4-Dinitrotoluene, ug/l	<10	32.2	34.4	50	64 %
Diethylphthalate, ug/l	<10	---	---	---	---
N-Nitrosodiphenylamine/Diph enylamine, ug/l	<10	---	---	---	---
Hexachlorobenzene, ug/l	<10	---	---	---	---
4-Bromophenyl phenyl ether, ug/l	<10	---	---	---	---
Phenanthrene, ug/l	<10	---	---	---	---
Anthracene, ug/l	<10	---	---	---	---
Di-n-butylphthalate, ug/l	<10	---	---	---	---
Fluoranthene, ug/l	<10	---	---	---	---
Pyrene, ug/l	<10	35.9	38.8	50	72 %
Benzidine, ug/l	<80	---	---	---	---
Butylbenzylphthalate, ug/l	<10	---	---	---	---
bis(2-Ethylhexyl)phthalate, ug/l	<10	---	---	---	---
Chrysene, ug/l	<10	---	---	---	---
Benzo(a)anthracene, ug/l	<10	---	---	---	---
3,3'-Dichlorobenzidine, ug/l	<20	---	---	---	---
Di-n-octylphthalate, ug/l	<10	---	---	---	---
Benzo(b)fluoranthene, ug/l	<10	---	---	---	---
Benzo(k)fluoranthene, ug/l	<10	---	---	---	---
Benzo(a)pyrene, ug/l	<10	---	---	---	---
Indeno(1,2,3-cd)pyrene, ug/l	<10	---	---	---	---

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LOG NO: T9-30774  
 Received: 16 MAR 99  
 Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
 Tetra Tech NDS, Inc.  
 794 South Military Drive  
 Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
 Sampled By: RO  
 Code: 182590322

REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-7	Method Blank		TTN004
30774-8	Lab Control Standard Result		TTN004
30774-9	Lab Control Standard Duplicate Result		TTN004
30774-10	Expected Value, LCS/LCSD		TTN004
30774-11	Lab Control Standard % Recovery		TTN004

PARAMETER	30774-7	30774-8	30774-9	30774-10	30774-11
Dibenzo(a,h)anthracene, ug/l	<10	---	---	---	---
Benzo(g,h,i)perylene, ug/l	<10	---	---	---	---
N-Nitrosodimethylamine, ug/l	<10	---	---	---	---
2-Chlorophenol, ug/l	<10	64.2	69.2	100	64 %
2-Nitrophenol, ug/l	<10	---	---	---	---
Phenol, ug/l	<10	59.4	61.5	100	59 %
2,4-Dimethylphenol, ug/l	<10	---	---	---	---
2,4-Dichlorophenol, ug/l	<10	---	---	---	---
2,4,6-Trichlorophenol, ug/l	<10	---	---	---	---
4-Chloro-3-methylphenol, ug/l	<10	68.0	74.8	100	68 %
2,4-Dinitrophenol, ug/l	<50	---	---	---	---
2-Methyl-4,6-dinitrophenol, ug/l	<50	---	---	---	---
Pentachlorophenol, ug/l	<50	53.3	63.7	100	53 %
4-Nitrophenol, ug/l	<50	65.4	70.1	100	65 %
1,2-Diphenylhydrazine	<10	---	---	---	---
Surrogate - 2-Fluorophenol	63 %	67 %	72 %	---	---
Surrogate - Phenol d5	62 %	66 %	72 %	---	---
Surrogate - Nitrobenzene - d5	61 %	67 %	72 %	---	---
Surrogate - 2-Fluorobiphenyl	61 %	66 %	72 %	---	---
Surrogate - 2,4,6-Tribromophenol	69 %	77 %	80 %	---	---
Surrogate - Terphenyl - d14	70 %	74 %	79 %	---	---
Prep Date	03.16.99	03.16.99	03.16.99	---	---
Analyst	PS	PS	PS	---	---
Analysis Date	03.18.99	03.18.99	03.18.99	---	---
Batch ID	0316A	0316A	0316A	---	---
Dilution Factor	1.0	1.0	1.0	---	---

# SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

2846 Industrial Plaza Drive (32301) • P.O. Box 13056 • Tallahassee, FL 32317-3056 • (850) 878-3994 • Fax (850) 878-9504

LOG NO: T9-30774  
Received: 16 MAR 99  
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Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 175990319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#		
30774-7	Method Blank		TTN004		
30774-8	Lab Control Standard Result		TTN004		
30774-9	Lab Control Standard Duplicate Result		TTN004		
30774-10	Expected Value, LCS/LCSD		TTN004		
30774-11	Lab Control Standard % Recovery		TTN004		
PARAMETER	30774-7	30774-8	30774-9	30774-10	30774-11
Petroleum Range Organics (FL-PRO)					
Petroleum Hydrocarbons , mg/l	<0.30	1.89	2.23	2.72	69 %
Surrogate, o-Terphenyl	56 %	46 %	56 %	---	---
Surrogate-C39	120 %	103 %	118 %	---	---
Prep Date	03.16.99	03.16.99	03.16.99	---	---
Analyst	BM	BM	BM	---	---
Analysis Date	03.17.99	03.17.99	03.17.99	---	---
Batch ID	0316D	0316D	0316D	---	---
Dilution Factor	1.0	1.0	1.0	---	---
RCRA Metals (6010)					
Arsenic, mg/l	<0.010	2.24	2.14	2.00	112 %
Barium, mg/l	<0.010	2.12	2.03	2.00	106 %
Cadmium, mg/l	<0.0050	2.20	2.12	2.00	110 %
Chromium, mg/l	<0.010	2.16	2.08	2.00	108 %
Lead, mg/l	<0.0050	2.20	2.13	2.00	110 %
Selenium, mg/l	<0.010	2.12	2.04	2.00	106 %
Silver, mg/l	<0.010	2.11	2.03	2.00	106 %
Prep Date	03.16.99	03.16.99	03.16.99	---	---
Analyst	CLD	CLD	CLD	---	---
Analysis Date	03.17.99	03.17.99	03.17.99	---	---
Batch ID	0316J	0316J	0316J	---	---
Dilution Factor	1.0	1.0	1.0	---	---

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Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 175990319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#		
30774-7	Method Blank		TTN004		
30774-8	Lab Control Standard Result		TTN004		
30774-9	Lab Control Standard Duplicate Result		TTN004		
30774-10	Expected Value, LCS/LCSD		TTN004		
30774-11	Lab Control Standard % Recovery		TTN004		
PARAMETER	30774-7	30774-8	30774-9	30774-10	30774-11
<b>Mercury (7470)</b>					
Mercury, mg/l	<0.00020	0.00101	0.00101	0.00100	101 %
Prep Date	03.16.99	03.16.99	03.16.99	---	---
Analyst	KW	KW	KW	---	---
Analysis Date	03.17.99	03.17.99	03.17.99	---	---
Batch ID	0316U	0316U	0316U	---	---
Dilution Factor	1.0	1.0	1.0	---	---
<b>Metals in TCLP Extract (6010)</b>					
Arsenic (TCLP-6010), mg/l	<0.20	1.10	0.961	1.00	110 %
Barium (TCLP-6010), mg/l	<1.0	1.17	1.17	1.00	117 %
Cadmium (TCLP-6010), mg/l	<0.10	1.09	0.958	1.00	109 %
Chromium (TCLP-6010), mg/l	<0.20	1.02	1.04	1.00	102 %
Lead (TCLP-6010), mg/l	<0.20	1.06	0.926	1.00	106 %
Selenium (TCLP-6010), mg/l	<0.50	1.07	0.930	1.00	107 %
Silver (TCLP-6010), mg/l	<0.10	1.10	1.11	1.00	110 %
Prep Date	03.18.99	03.18.99	03.18.99	---	---
Analyst	DWH	DWH	DWH	---	---
Analysis Date	03.18.99	03.18.99	03.18.99	---	---
Batch ID	03180	03180	03180	---	---
Dilution Factor	1.0	1.0	1.0	---	---

# SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

2846 Industrial Plaza Drive (32301) • P.O. Box 13056 • Tallahassee, FL 32317-3056 • (850) 878-3994 • Fax (850) 878-9504

LOG NO: T9-30774  
 Received: 16 MAR 99  
 Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
 Tetra Tech NUS, Inc.  
 794 South Military Drive  
 Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
 Sampled By: RO  
 Code: 175990319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#		
30774-7	Method Blank		TTN004		
30774-8	Lab Control Standard Result		TTN004		
30774-9	Lab Control Standard Duplicate Result		TTN004		
30774-10	Expected Value, LCS/LCSD		TTN004		
30774-11	Lab Control Standard % Recovery		TTN004		
PARAMETER	30774-7	30774-8	30774-9	30774-10	30774-11
Mercury in TCLP Extract (7470)					
Mercury, mg/l	<0.020	0.00199	0.00194	0.00200	100 %
Prep Date	03.17.99	03.17.99	03.17.99	---	---
Analyst	KW	KW	KW	---	---
Analysis Date	03.17.99	03.17.99	03.17.99	---	---
Batch ID	0317X	0317X	0317X	---	---
Dilution Factor	100	100	100	---	---

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Mr. Arnold Lamb, QA Officer  
Tetra Tech NDS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 185490319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-12	Lab Control Standard Duplicate % Recovery		TTN004
30774-13	Precision (%RPD) of LCS/LCSD		TTN004
30774-14	LCS Accuracy Control Limit (%R)		TTN004
30774-15	LCS Precision Control Limit (Advisory) %RPD		TTN004
30774-16	Control Limit Source		TTN004

PARAMETER	30774-12	30774-13	30774-14	30774-15	30774-16
Volatiles by GC/MS (8260)					
Benzene, %	110 %	0 %	52-134 %	<31 %	SL
Chlorobenzene, %	110 %	2.8 %	60-127 %	<25 %	SL
1,1-Dichloroethene, %	71 %	1.4 %	38-155 %	<25 %	SL
Toluene, %	96 %	1.0 %	76-128 %	<25 %	SL
Trichloroethylene, %	113 %	0.89 %	10-213 %	<40 %	SL
Surrogate - Toluene-d8	---	---	77-122 %	---	SL
Surrogate - 4-Bromofluorobenzene	---	---	74-126 %	---	SL
Surrogate - Dibromofluoromethane	---	---	70-130 %	---	SL
Analyst	WHE	WHE	WHE	---	---

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Tetra Tech NUS, Inc.  
794 South Military Drive  
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Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport

Sampled By: RO

Code: 185690319

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## REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#
30774-12	Lab Control Standard Duplicate % Recovery		TTN004
30774-13	Precision (%RPD) of LCS/LCSD		TTN004
30774-14	LCS Accuracy Control Limit (%R)		TTN004
30774-15	LCS Precision Control Limit (Advisory) %RPD		TTN004
30774-16	Control Limit Source		TTN004

PARAMETER	30774-12	30774-13	30774-14	30774-15	30774-16
<b>Semivolatile Organics (8270)</b>					
1,4-Dichlorobenzene, %	51 %	10 %	27-103 %	<31 %	SL
n-Nitrosodi-n-propylamine, %	68 %	7.6 %	31-138 %	<30 %	SL
1,2,4-Trichlorobenzene, %	55 %	13 %	28-110 %	<28 %	SL
Acenaphthene, %	71 %	5.8 %	36-121 %	<35 %	SL
2,4-Dinitrotoluene, %	69 %	7.6 %	37-129 %	<32 %	SL
Pyrene, %	78 %	8.0 %	31-139 %	<42 %	SL
2-Chlorophenol, %	69 %	7.6 %	38-115 %	<34 %	SL
Phenol, %	62 %	5.0 %	33-122 %	<36 %	SL
4-Chloro-3-methylphenol, %	75 %	9.7 %	34-126 %	<31 %	SL
Pentachlorophenol, %	64 %	19 %	19-148 %	<33 %	SL
4-Nitrophenol, %	70 %	7.4 %	12-143 %	<44 %	SL
Surrogate - 2-Fluorophenol	---	---	29-121 %	---	SL
Surrogate - Phenol d5	---	---	25-128 %	---	SL
Surrogate - Nitrobenzene - d5	---	---	34-130 %	---	SL
Surrogate - 2-Fluorobiphenyl	---	---	36-124 %	---	SL
Surrogate - 2,4,6-Tribromophenol	---	---	29-143 %	---	SL
Surrogate - Terphenyl - d14	---	---	14-148 %	---	SL
Analyst	PS	PS	PS	---	---
<b>Petroleum Range Organics (FL-PRO)</b>					
Petroleum Hydrocarbons, %	82 %	17 %	41-101 %	<20 %	SL
Surrogate, o-Terphenyl	---	---	38-156 %	---	SL
Surrogate-C39	---	---	24-137 %	---	SL

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LOG NO: T9-30774  
Received: 16 MAR 99  
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Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 185490319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES	DATE/ TIME SAMPLED	SDG#		
30774-12	Lab Control Standard Duplicate & Recovery		TTN004		
30774-13	Precision (%RPD) of LCS/LCSD		TTN004		
30774-14	LCS Accuracy Control Limit (%R)		TTN004		
30774-15	LCS Precision Control Limit (Advisory) %RPD		TTN004		
30774-16	Control Limit Source		TTN004		
PARAMETER	30774-12	30774-13	30774-14	30774-15	30774-16
<b>RCRA Metals (6010)</b>					
Arsenic, %	107 %	4.6 %	75-125 %	<20 %	SL
Barium, %	102 %	3.8 %	75-125 %	<20 %	SL
Cadmium, %	106 %	3.7 %	75-125 %	<20 %	SL
Chromium, %	104 %	3.8 %	75-125 %	<20 %	SL
Lead, %	106 %	3.7 %	75-125 %	<20 %	SL
Selenium, %	102 %	3.8 %	75-125 %	<20 %	SL
Silver, %	102 %	3.8 %	75-125 %	<20 %	SL
Analyst	CLD	CLD	CLD	---	---
<b>Mercury (7470)</b>					
Mercury, %	101 %	0 %	80-120 %	<20 %	SL
Analyst	KW	KW	KW	---	---
<b>Metals in TCLP Extract (6010)</b>					
Arsenic (TCLP-6010), %	96 %	14 %	75-125 %	<20 %	SL
Barium (TCLP-6010), %	117 %	0 %	75-125 %	<20 %	SL
Cadmium (TCLP-6010), %	96 %	13 %	75-125 %	<20 %	SL
Chromium (TCLP-6010), %	89 %	3.1 %	75-125 %	<20 %	SL
Lead (TCLP-6010), %	93 %	13 %	75-125 %	<20 %	SL
Selenium (TCLP-6010), %	93 %	14 %	75-125 %	<20 %	SL
Silver (TCLP-6010), %	111 %	0.90 %	75-125 %	<20 %	SL
Analyst	DWH	DWH	DWH	---	---
<b>Mercury in TCLP Extract (7470)</b>					
Mercury, %	97 %	3.0 %	80-120 %	<20 %	SL
Analyst	KW	KW	KW	---	---

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LOG NO: T9-30774  
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Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 185490319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED	SDG#		
30774-17	Method Blank		TTN004		
30774-18	Lab Control Standard Result		TTN004		
30774-19	Lab Control Standard Duplicate Result		TTN004		
30774-20	Expected Value, LCS/LCSD		TTN004		
30774-21	Lab Control Standard % Recovery		TTN004		
PARAMETER	30774-17	30774-18	30774-19	30774-20	30774-21
Volatiles by GC/MS (8260)					
Benzene, ug/kg dw	<5.0	41.9	41.3	50.0	84 %
Bromodichloromethane, ug/kg dw	<5.0	---	---	---	---
Bromoform, ug/kg dw	<5.0	---	---	---	---
Carbon tetrachloride, ug/kg dw	<5.0	---	---	---	---
Chlorobenzene, ug/kg dw	<5.0	42.2	43.1	50.0	84 %
Chloroethane, ug/kg dw	<10	---	---	---	---
Chloroform, ug/kg dw	<5.0	---	---	---	---
Chloromethane, ug/kg dw	<10	---	---	---	---
Dibromochloromethane, ug/kg dw	<10	---	---	---	---
1,1-Dichloroethane, ug/kg dw	<5.0	---	---	---	---
1,2-Dichloroethane, ug/kg dw	<5.0	---	---	---	---
1,1-Dichloroethene, ug/kg dw	<5.0	34.6	33.6	50.0	69 %
trans-1,2-Dichloroethylene, ug/kg dw	<5.0	---	---	---	---
1,2-Dichloropropane, ug/kg dw	<5.0	---	---	---	---
cis-1,3-Dichloropropene, ug/kg dw	<5.0	---	---	---	---
trans-1,3-Dichloropropene, ug/kg dw	<5.0	---	---	---	---
Ethylbenzene, ug/kg dw	<5.0	---	---	---	---
Methylene chloride (Dichloromethane), ug/kg dw	<5.0	---	---	---	---

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Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport

Sampled By: RO

Code: 182590322

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## REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED	SDG#		
30774-17	Method Blank		TTN004		
30774-18	Lab Control Standard Result		TTN004		
30774-19	Lab Control Standard Duplicate Result		TTN004		
30774-20	Expected Value, LCS/LCSD		TTN004		
30774-21	Lab Control Standard % Recovery		TTN004		
PARAMETER	30774-17	30774-18	30774-19	30774-20	30774-21
1,1,2,2-Tetrachloroethane, ug/kg dw	<5.0	---	---	---	---
Tetrachloroethene, ug/kg dw	<5.0	---	---	---	---
Toluene, ug/kg dw	<5.0	41.2	40.4	50.0	82 %
1,1,1-Trichloroethane, ug/kg dw	<5.0	---	---	---	---
1,1,2-Trichloroethane, ug/kg dw	<5.0	---	---	---	---
Trichloroethylene, ug/kg dw	<5.0	46.4	45.6	50.0	93 %
Vinyl chloride, ug/kg dw	<10	---	---	---	---
Surrogate - Toluene-d8	96 %	102 %	102 %	---	---
Surrogate - 4-Bromofluorobenzene	104 %	103 %	104 %	---	---
Surrogate - Dibromofluoromethane	118 %	122 %	126 %	---	---
2-Chloroethylvinyl Ether, ug/kg dw	<50	---	---	---	---
Acrolein, ug/kg dw	<100	---	---	---	---
Acrylonitrile, ug/kg dw	<100	---	---	---	---
Xylenes, ug/kg dw	<5.0	---	---	---	---
Methyl tert-butyl ether (MTBE), ug/kg dw	<50	---	---	---	---
Analyst	WHE	WHE	WHE	---	---
Analysis Date	03.18.99	03.16.99	03.18.99	---	---
Batch ID	0315N	0315N	0315N	---	---
Dilution Factor	1.0	1.0	1.0	---	---

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794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204(SS)

Project: VST Site 250/Bravo Pier-Mayport

Sampled By: RO

Code: 185490319

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## REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED	SDG#		
30774-17	Method Blank		TTN004		
30774-18	Lab Control Standard Result		TTN004		
30774-19	Lab Control Standard Duplicate Result		TTN004		
30774-20	Expected Value, LCS/LCSD		TTN004		
30774-21	Lab Control Standard & Recovery		TTN004		
PARAMETER	30774-17	30774-18	30774-19	30774-20	30774-21
Semivolatile Organics (8270)					
1,3-Dichlorobenzene, ug/kg dw	<330	---	---	---	---
1,4-Dichlorobenzene, ug/kg dw	<330	990	947	1670	59 %
Hexachloroethane, ug/kg dw	<330	---	---	---	---
bis(2-Chloroethyl) ether, ug/kg dw	<330	---	---	---	---
1,2-Dichlorobenzene, ug/kg dw	<330	---	---	---	---
bis(2-Chloroisopropyl) ether , ug/kg dw	<330	---	---	---	---
n-Nitrosodi-n-propylamine, ug/kg dw	<330	928	943	1670	56 %
Nitrobenzene, ug/kg dw	<330	---	---	---	---
Hexachlorobutadiene, ug/kg dw	<330	---	---	---	---
1,2,4-Trichlorobenzene, ug/kg dw	<330	1040	1000	1670	62 %
Isophorone, ug/kg dw	<330	---	---	---	---
Naphthalene, ug/kg dw	<330	---	---	---	---
bis(2-Chloroethoxy)methane, ug/kg dw	<330	---	---	---	---
Hexachlorocyclopentadiene, ug/kg dw	<330	---	---	---	---
2-Chloronaphthalene, ug/kg dw	<330	---	---	---	---
Acenaphthylene, ug/kg dw	<330	---	---	---	---
Acenaphthene, ug/kg dw	<330	1160	1100	1670	69 %

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 Tetra Tech NUS, Inc.  
 794 South Military Drive  
 Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VBT Site 250/Bravo Pier-Mayport  
 Sampled By: RO  
 Code: 185490319

REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED	SDG#
30774-17	Method Blank		TTN004
30774-18	Lab Control Standard Result		TTN004
30774-19	Lab Control Standard Duplicate Result		TTN004
30774-20	Expected Value, LCS/LCSD		TTN004
30774-21	Lab Control Standard & Recovery		TTN004

PARAMETER	30774-17	30774-18	30774-19	30774-20	30774-21
Dimethylphthalate, ug/kg dw	<330	---	---	---	---
2,6-Dinitrotoluene, ug/kg dw	<330	---	---	---	---
Fluorene, ug/kg dw	<330	---	---	---	---
4-Chlorophenylphenyl ether, ug/kg dw	<330	---	---	---	---
2,4-Dinitrotoluene, ug/kg dw	<330	1050	990	1670	63 †
Diethylphthalate, ug/kg dw	<330	---	---	---	---
N-Nitrosodiphenylamine/Diphenylamine, ug/kg dw	<330	---	---	---	---
Hexachlorobenzene, ug/kg dw	<330	---	---	---	---
4-Bromophenyl phenyl ether, ug/kg dw	<330	---	---	---	---
Phenanthrene, ug/kg dw	<330	---	---	---	---
Anthracene, ug/kg dw	<330	---	---	---	---
Di-n-butylphthalate, ug/kg dw	<330	---	---	---	---
Fluoranthene, ug/kg dw	<330	---	---	---	---
Pyrene, ug/kg dw	<330	1250	1220	1670	75 †
Benzidine, ug/kg dw	<2700	---	---	---	---
Butylbenzylphthalate, ug/kg dw	<330	---	---	---	---
bis(2-Ethylhexyl)phthalate, ug/kg dw	<330	---	---	---	---
Chrysene, ug/kg dw	<330	---	---	---	---

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Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 185490319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED	SDG#
30774-17	Method Blank		TTN004
30774-18	Lab Control Standard Result		TTN004
30774-19	Lab Control Standard Duplicate Result		TTN004
30774-20	Expected Value, LCS/LCSD		TTN004
30774-21	Lab Control Standard % Recovery		TTN004

PARAMETER	30774-17	30774-18	30774-19	30774-20	30774-21
Benzo(a)anthracene, ug/kg dw	<330	---	---	---	---
3,3'-Dichlorobenzidine, ug/kg dw	<660	---	---	---	---
Di-n-octylphthalate, ug/kg dw	<330	---	---	---	---
Benzo(b)fluoranthene, ug/kg dw	<330	---	---	---	---
Benzo(k)fluoranthene, ug/kg dw	<330	---	---	---	---
Benzo(a)pyrene, ug/kg dw	<330	---	---	---	---
Indeno(1,2,3-cd)pyrene, ug/kg dw	<330	---	---	---	---
Dibenzo(a,h)anthracene, ug/kg dw	<330	---	---	---	---
Benzo(g,h,i)perylene, ug/kg dw	<330	---	---	---	---
N-Nitrosodimethylamine, ug/kg dw	<330	---	---	---	---
2-Chlorophenol, ug/kg dw	<330	2110	1990	3330	63 %
2-Nitrophenol, ug/kg dw	<330	---	---	---	---
Phenol, ug/kg dw	<330	1950	1880	3330	59 %
2,4-Dimethylphenol, ug/kg dw	<330	---	---	---	---
2,4-Dichlorophenol, ug/kg dw	<330	---	---	---	---
2,4,6-Trichlorophenol, ug/kg dw	<330	---	---	---	---
4-Chloro-3-methylphenol, ug/kg dw	<330	2210	2290	3330	66 %
2,4-Dinitrophenol, ug/kg dw	<1700	---	---	---	---
2-Methyl-4,6-dinitrophenol, ug/kg dw	<1700	---	---	---	---
Pentachlorophenol, ug/kg dw	<1700	1860	1750	3330	56 %
4-Nitrophenol, ug/kg dw	<1700	2170	2090	3330	65 %

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Client PO. No.: N7867-P99204(SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 182590322

### REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED	SDG#
30774-17	Method Blank		TTN004
30774-18	Lab Control Standard Result		TTN004
30774-19	Lab Control Standard Duplicate Result		TTN004
30774-20	Expected Value, LCS/LCSD		TTN004
30774-21	Lab Control Standard % Recovery		TTN004

PARAMETER	30774-17	30774-18	30774-19	30774-20	30774-21
1,2-Diphenylhydrazine, ug/kg dw	<330	---	---	---	---
Surrogate - 2-Fluorophenol	72 %	66 %	64 %	---	---
Surrogate - Phenol d5	71 %	65 %	62 %	---	---
Surrogate - Nitrobenzene - d5	70 %	62 %	61 %	---	---
Surrogate - 2-Fluorobiphenyl	73 %	71 %	68 %	---	---
Surrogate - 2,4,6-Tribromophenol	77 %	75 %	69 %	---	---
Surrogate - Terphenyl - d14	87 %	78 %	75 %	---	---
Prep Date	03.16.99	03.16.99	03.16.99	---	---
Analyst	PS	PS	PS	---	---
Analysis Date	03.18.99	03.18.99	03.18.99	---	---
Batch ID	0316H	0316H	0316H	---	---
Dilution Factor	1.0	1.0	1.0	---	---
Petroleum Range Organics (FL-PRO)					
Petroleum Hydrocarbons , mg/kg dw	<10	46.3	46.0	90.7	51 %
Surrogate, o-Terphenyl	37 %	34 %	35 %	---	---
Surrogate-C39	89 %	66 %	58 %	---	---
Prep Date	03.16.99	03.16.99	03.16.99	---	---
Analyst	BM	BM	BM	---	---
Analysis Date	03.17.99	03.17.99	03.17.99	---	---
Batch ID	0316I	0316I	0316I	---	---
Dilution Factor	1.0	1.0	1.0	---	---

# SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

2846 Industrial Plaza Drive (32301) • P.O. Box 13056 • Tallahassee, FL 32317-3056 • (850) 878-3994 • Fax (850) 878-9504

LOG NO: T9-30774  
Received: 16 MAR 99  
Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-B99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 185490319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED	SDG#
30774-17	Method Blank		TTN004
30774-18	Lab Control Standard Result		TTN004
30774-19	Lab Control Standard Duplicate Result		TTN004
30774-20	Expected Value, LCS/LCSD		TTN004
30774-21	Lab Control Standard % Recovery		TTN004

PARAMETER	30774-17	30774-18	30774-19	30774-20	30774-21
<b>RCRA Metals (6010)</b>					
Arsenic, mg/kg dw	<1.0	203	204	2.00	102 %
Barium, mg/kg dw	<1.0	200	208	2.00	100 %
Cadmium, mg/kg dw	<0.50	203	205	2.00	102 %
Chromium, mg/kg dw	<1.0	204	204	2.00	102 %
Lead, mg/kg dw	<0.50	202	204	2.00	101 %
Selenium, mg/kg dw	<1.0	188	191	2.00	94 %
Silver, mg/kg dw	<1.0	4.11	4.23	5.00	82 %
Prep Date	03.17.99	03.17.99	03.17.99	---	---
Analyst	CLD	CLD	CLD	---	---
Analysis Date	03.18.99	03.18.99	03.18.99	---	---
Batch ID	0317C	0317C	0317C	---	---
Dilution Factor	1.0	1.0	1.0	---	---
<b>Mercury (7471)</b>					
Mercury, mg/kg dw	<0.020	0.0494	0.0494	0.0500	99 %
Prep Date	03.17.99	03.17.99	03.17.99	---	---
Analyst	KW	KW	KW	---	---
Analysis Date	03.17.99	03.17.99	03.17.99	---	---
Batch ID	0317R	0317R	0317R	---	---
Dilution Factor	1.0	1.0	1.0	---	---

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Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 185490319

## REPORT OF RESULTS

Page 35

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED	SDG#
30774-17	Method Blank		TTN004
30774-18	Lab Control Standard Result		TTN004
30774-19	Lab Control Standard Duplicate Result		TTN004
30774-20	Expected Value, LCS/LCSD		TTN004
30774-21	Lab Control Standard & Recovery		TTN004

PARAMETER	30774-17	30774-18	30774-19	30774-20	30774-21
<b>Metals in TCLP Extract (6010)</b>					
Arsenic (TCLP-6010), mg/l	<0.20	1.10	0.961	1.00	110 %
Barium (TCLP-6010), mg/l	<1.0	1.17	1.17	1.00	117 %
Cadmium (TCLP-6010), mg/l	<0.10	1.09	0.958	1.00	109 %
Chromium (TCLP-6010), mg/l	<0.20	1.02	1.04	1.00	102 %
Lead (TCLP-6010), mg/l	<0.20	1.06	0.926	1.00	106 %
Selenium (TCLP-6010), mg/l	<0.50	1.07	0.930	1.00	107 %
Silver (TCLP-6010), mg/l	<0.10	1.10	1.11	1.00	110 %
Prep Date	03.18.99	03.18.99	03.18.99	---	---
Analyst	DWH	DWH	DWH	---	---
Analysis Date	03.18.99	03.18.99	03.18.99	---	---
Batch ID	03180	03180	03180	---	---
Dilution Factor	1.0	1.0	1.0	---	---
<b>Mercury in TCLP Extract (7470)</b>					
Mercury, mg/l	<0.020	0.00199	0.00194	0.00200	100 %
Prep Date	03.17.99	03.17.99	03.17.99	---	---
Analyst	KW	KW	KW	---	---
Analysis Date	03.17.99	03.17.99	03.17.99	---	---
Batch ID	0317X	0317X	0317X	---	---
Dilution Factor	100	100	100	---	---

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LOG NO: T9-30774  
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Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 190090319  
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## REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED	SDG#		
30774-22	Lab Control Standard Duplicate % Recovery		TTN004		
30774-23	Precision (%RPD) of LCS/LCSD		TTN004		
30774-24	LCS Accuracy Control Limit (%R)		TTN004		
30774-25	LCS Precision Control Limit (Advisory) %RPD		TTN004		
30774-26	Control Limit Source		TTN004		
PARAMETER	30774-22	30774-23	30774-24	30774-25	30774-26
Volatiles by GC/MS (8260)					
Benzene, %	82 %	2.4 %	64-144 %	<25 %	SL
Chlorobenzene, %	86 %	2.4 %	56-152 %	<25 %	SL
1,1-Dichloroethene, %	67 %	2.9 %	44-157 %	<23 %	SL
Toluene, %	81 %	2.4 %	67-142 %	<25 %	SL
Trichloroethylene, %	91 %	2.2 %	41-134 %	<25 %	SL
Surrogate - Toluene-d8	---	---	64-136 %	---	SL
Surrogate - 4-Bromofluorobenzene	---	---	63-135 %	---	SL
Surrogate - Dibromofluoromethane	---	---	58-142 %	---	SL
Analyst	WHE	WHE	WHE	---	---

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Project: VST Site 250/Bravo Pier-Mayport  
 Sampled By: RO  
 Code: 185490319  
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REPORT OF RESULTS

LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED	SDG#
30774-22	Lab Control Standard Duplicate % Recovery		TTN004
30774-23	Precision (%RPD) of LCS/LCSD		TTN004
30774-24	LCS Accuracy Control Limit (%R)		TTN004
30774-25	LCS Precision Control Limit (Advisory) %RPD		TTN004
30774-26	Control Limit Source		TTN004

PARAMETER	30774-22	30774-23	30774-24	30774-25	30774-26
<b>Semivolatiles Organics (8270)</b>					
1,4-Dichlorobenzene, %	57 %	3.4 %	10-1-5 %	<31 %	SL
n-Nitrosodi-n-propylamine, %	56 %	0 %	11-122 %	<37 %	SL
1,2,4-Trichlorobenzene, %	60 %	3.3 %	10-112 %	<22 %	SL
Acenaphthene, %	66 %	4.4 %	18-123 %	<49 %	SL
2,4-Dinitrotoluene, %	59 %	6.6 %	15-118 %	<57 %	SL
Pyrene, %	73 %	2.7 %	10-133 %	<42 %	SL
2-Chlorophenol, %	60 %	4.8 %	15-111 %	<38 %	SL
Phenol, %	56 %	5.2 %	13-115 %	<39 %	SL
4-Chloro-3-methylphenol, %	69 %	4.4 %	24-114 %	<32 %	SL
Pentachlorophenol, %	53 %	5.6 %	10-140 %	<55 %	SL
4-Nitrophenol, %	63 %	3.1 %	15-118 %	<57 %	SL
Surrogate - 2-Fluorophenol	---	---	16-113 %	---	SL
Surrogate - Phenol d5	---	---	19-114 %	---	SL
Surrogate - Nitrobenzene - d5	---	---	20-106 %	---	SL
Surrogate - 2-Fluorobiphenyl	---	---	30-105 %	---	SL
Surrogate - 2,4,6-Tribromophenol	---	---	23-129 %	---	SL
Surrogate - Terphenyl - d14	---	---	30-131 %	---	SL
Analyst	PS	PS	PS	---	---
<b>Petroleum Range Organics (FL-PRO)</b>					
Petroleum Hydrocarbons, %	51 %	0 %	26-116 %	<25 %	SL
Surrogate, o-Terphenyl	---	---	15-154 %	---	SL
Surrogate-C39	---	---	30-118 %	---	SL

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LOG NO: T9-30774  
Received: 16 MAR 99  
Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204(SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 185490319

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED	SDG#		
30774-22	Lab Control Standard Duplicate & Recovery		TTN004		
30774-23	Precision (%RPD) of LCS/LCSD		TTN004		
30774-24	LCS Accuracy Control Limit (%R)		TTN004		
30774-25	LCS Precision Control Limit (Advisory) %RPD		TTN004		
30774-26	Control Limit Source		TTN004		
PARAMETER	30774-22	30774-23	30774-24	30774-25	30774-26
<b>RCRA Metals (6010)</b>					
Arsenic, %	102 %	0 %	75-125 %	<20 %	SL
Barium, %	104 %	3.9 %	75-125 %	<20 %	SL
Cadmium, %	102 %	0 %	75-125 %	<20 %	SL
Chromium, %	102 %	0 %	75-125 %	<20 %	SL
Lead, %	102 %	0.99 %	75-125 %	<20 %	SL
Selenium, %	96 %	2.1 %	75-125 %	<20 %	SL
Silver, %	85 %	3.6 %	75-125 %	<20 %	SL
Analyst	CLD	CLD	CLD	---	---
<b>Mercury (7471)</b>					
Mercury, %	99 %	1.0 %	75-125 %	<20 %	SL
Analyst	---	KW	KW	---	---
<b>Metals in TCLP Extract (6010)</b>					
Arsenic (TCLP-6010), %	96 %	14 %	75-125 %	<20 %	SL
Barium (TCLP-6010), %	117 %	0 %	75-125 %	<20 %	SL
Cadmium (TCLP-6010), %	96 %	13 %	75-125 %	<20 %	SL
Chromium (TCLP-6010), %	89 %	3.1 %	75-125 %	<20 %	SL
Lead (TCLP-6010), %	93 %	13 %	75-125 %	<20 %	SL
Selenium (TCLP-6010), %	93 %	14 %	75-125 %	<20 %	SL
Silver (TCLP-6010), %	111 %	0.90 %	75-125 %	<20 %	SL
Analyst	DWH	DWH	DWH	---	---
<b>Mercury in TCLP Extract (7470)</b>					
Mercury, %	97 %	3.0 %	80-120 %	<20 %	SL
Analyst	KW	KW	KW	---	---

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LOG NO: T9-30774  
Received: 16 MAR 99  
Reported: 19 MAR 99

Mr. Arnold Lamb, QA Officer  
Tetra Tech NUS, Inc.  
794 South Military Drive  
Deerfield Beach, FL 33442

Client PO. No.: N7867-P99204 (SS)

Project: VST Site 250/Bravo Pier-Mayport  
Sampled By: RO  
Code: 182590322

## REPORT OF RESULTS

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LOG NO	SAMPLE DESCRIPTION , QC REPORT FOR SOLID/SEMISOLID	DATE/ TIME SAMPLED	SDG#
30774-22	Lab Control Standard Duplicate & Recovery		TTN004
30774-23	Precision (%RPD) of LCS/LCSD		TTN004
30774-24	LCS Accuracy Control Limit (%R)		TTN004
30774-25	LCS Precision Control Limit (Advisory) %RPD		TTN004
30774-26	Control Limit Source		TTN004

PARAMETER	30774-22	30774-23	30774-24	30774-25	30774-26
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Method: EPA SW-846

Florida Dept. of Health Certification No.: E81005

FDEP CompQAP No.: 890142G

\*F33 Control limits are established only for surrogate concentration levels specified by EPA methods. Because the sample was diluted prior to analysis, surrogate recoveries are not reported.

\*F36 Surrogate recovery was outside established limits due to a coeluting matrix interference in the sample.

\*F65 Elevated detection limit was reported due to sample matrix interference which required sample or extract dilution.

\*J The flag 'J' indicates the presence of a compound that meets the identification criteria, but the result is less than the RL and greater than the MDL.



Laura B. Snead, Project Manager

## Semivolatile TICs

CLIENT: TETRA TECH NUV, INC.

PROJECT: 2900083

LOG NUMBER: T930774-1

SAMPLE DESCRIPTION: GW-GB01

MATRIX: LIQUID

CAS#	Compound	Est
1.	UNKNOWN	8 ug/L
2.	UNKNOWN ALKYLATED BENZENE	13 ug/L
3. 119642	NAPHTHALENE, 1,2,3,4-TETRAHYDRO-	6 ug/L
4.	UNKNOWN TETRAHYDRO METHYL NAPHTHALENE ISOMER	10 ug/L
5.	UNKNOWN TETRAHYDRO METHYL NAPHTHALENE ISOMER	7 ug/L
6. 91576	2-METHYLNAPHTHALENE	20 ug/L
7. 264095	1-METHYLNAPHTHALENE	6 ug/L
8.	UNKNOWN ETHYL NAPHTHALENE ISOMER	9 ug/L
9.	UNKNOWN DIMETHYL NAPHTHALENE ISOMER	16 ug/L
10.	UNKNOWN DIMETHYL NAPHTHALENE ISOMER	21 ug/L
11.	UNKNOWN ALKANE	7 ug/L
12.	UNKNOWN	9 ug/L
13.	UNKNOWN ALKYLATED NAPHTHALENE	8 ug/L
14.	UNKNOWN TRIMETHYL NAPHTHLENE ISOMER	7 ug/L
15.	UNKNOWN TRIMETHYL NAPHTHLENE ISOMER	8 ug/L
16.	UNKNOWN	18 ug/L
17.	UNKNOWN HYDROCARBON	16 ug/L
18.	UNKNOWN ALKYLATED BENZENE	5 ug/L
19.	UNKNOWN	5 ug/L
20.		

Tentatively Identified Compounds (TICs) are identified by comparison of the spectrum of an unknown peak to mass spectra stored in the National Institute of Standard and Technology (NIST) library. The reported concentration is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

Semivolatile TICs

CLIENT: TETRA TECH NUV, INC.

PROJECT: 2900083

LOG NUMBER: T930774-4

SAMPLE DESCRIPTION: SS-GB02

MATRIX: SOIL

Est

CAS#	Compound	Est
1.	UNKNOWN	150 ug/Kg dw
2.	UNKNOWN	470 ug/Kg dw
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Tentatively Identified Compounds (TICs) are identified by comparison of the spectrum of an unknown peak to mass spectra stored in the National Institute of Standard and Technology (NIST) library. The reported concentration is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

## Semivolatile TICs

CLIENT: TETRA TECH NUV, INC.

PROJECT: 2900083

LOG NUMBER: T930774-3

SAMPLE DESCRIPTION: SS-GB01

MATRIX: SOIL

CAS#	Compound	Est
1.	UNKNOWN ALKYLATED BENZENE	6300 ug/Kg dw
2.	UNKNOWN HYDROCARBON	8900 ug/Kg dw
3.	UNKNOWN	6500 ug/Kg dw
4.	UNKNOWN HYDROCARBON	8900 ug/Kg dw
5.	UNKNOWN	6500 ug/Kg dw
6.	UNKNOWN HYDROCARBON	19,000 ug/Kg dw
7.	UNKNOWN	8800 ug/Kg dw
8. 91576	2-METHYLNAPHTHALENE	7400 ug/Kg dw
9.	UNKNOWN	18,000 ug/Kg dw
10.	UNKNOWN HYDROCARBON	16,000 ug/Kg dw
11.	UNKNOWN DIMETHYL NAPHTHALENE ISOMER	12,000 ug/Kg dw
12.	UNKNOWN DIMETHYL NAPHTHALENE ISOMER	13,000 ug/Kg dw
13.	UNKNOWN DIMETHYL NAPHTHALENE ISOMER	15,000 ug/Kg dw
14.	UNKNOWN HYDROCARBON	25,000 ug/Kg dw
15.	UNKNOWN HYDROCARBON	11,000 ug/Kg dw
16.	UNKNOWN ALKYLATED NAPHTHALENE	12,000 ug/Kg dw
17.	UNKNOWN TRIMETHYL NAPHTHALENE ISOMER	11,000 ug/Kg dw
18.	UNKNOWN TRIMETHYL NAPHTHALENE ISOMER	22,000 ug/Kg dw
19.	UNKNOWN TRIMETHYL NAPHTHALENE ISOMER	12,000 ug/Kg dw
20.	UNKNOWN HYDROCARBON	16,000 ug/Kg dw

Tentatively Identified Compounds (TICs) are identified by comparison of the spectrum of an unknown peak to mass spectra stored in the National Institute of Standard and Technology (NIST) library. The reported concentration is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

Volatiles TICs

CLIENT: Tetra Tech NUS

PROJECT: Bravo Pier-Mayport

LOG NUMBER: T930774-3

SAMPLE DESCRIPTION: 0250-SS-GB01

MATRIX: soil

CAS#	Compound	Estimated Concentration
1. 527537	1,2,3,4-tetramethylbenzene	7900 ug/kg_dw
2. 16526902	cis-bicyclo[5.1.0]octane	9700 ug/kg_dw
3. 99876	1-methyl-4-(1-methylethyl)-benzene	8400 ug/kg_dw
4. 119642	1,2,3,4-tetrahydronaphthalene	8400 ug/kg_dw
5. 4912929	2,3-dihydro-1,1-dimethyl-1H-indene	12000 ug/kg_dw
6. 1680519	1,2,3,4-tetrahydro-6-methyl-naphthalene	20000 ug/kg_dw
7. 2809645	1,2,3,4-tetrahydro-5-methyl-naphthalene	18000 ug/kg_dw
8. 2471832	1-ethylidene-1H-indene	14000 ug/kg_dw
9.		
10.		

----->>>> No additional TICs detected or searched. <<<<-----

Tentatively Identified Compounds (TICs) are identified by comparison of the spectrum of an unknown peak to mass spectra stored in the National Institute of Standard and Technology (NIST) library. The reported concentration is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

Volatile TICs

CLIENT: Tetra Tech NUS

PROJECT: Bravo Pier-Mayport

LOG NUMBER: T930774-4

SAMPLE DESCRIPTION: 0250-SS-GE02

MATRIX: soil

CAS#	Compound	Estimated Concentration
1.	No compounds were detected which met	
2.	the criteria for identification and	
3.	quantitation as tentatively identified	
4.	compounds.	
5.		
6.		
7.		
8.		
9.		
10.		
----->>>> No additional TICs detected or searched. <<<<-----		

Tentatively Identified Compounds (TICs) are identified by comparison of the spectrum of an unknown peak to mass spectra stored in the National Institute of Standard and Technology (NIST) library. The reported concentration is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

Volatile TICs

CLIENT: Tetra Tech NUS

PROJECT: Bravo Pier-Mayport

LOG NUMBER: T930774-5

SAMPLE DESCRIPTION: 0250-SS-GB03

MATRIX: soil

CAS#	Compound	Estimated Concentration
1. 50746537	1-methyl-2-(2-propenyl)-transcyclopentane	34000 ug/kg_dw
2. 527537	1,2,3,4-tetramethylbenzene	22000 ug/kg_dw
3. 99876	1-methyl-4-(1-methylethyl)-benzene	89000 ug/kg_dw
4. 119642	1,2,3,4-tetrahydronaphthalene	38000 ug/kg_dw
5. 4912929	2,3-dihydro-1,1-dimethyl-1H-indene	34000 ug/kg_dw
6. 16805191	1,2,3,4-tetrahydro-6-methyl-naphthalene	53000 ug/kg_dw
7. 2809649	1,2,3,4-tetrahydro-5-methyl-naphthalene	41000 ug/kg_dw
8. 4453901	1,4-dihydro-1,4-methanonaphthalene	60000 ug/kg_dw
9.		
10.		

----->>>> No additional TICs detected or searched. <<<<-----

Tentatively Identified Compounds (TICs) are identified by comparison of the spectrum of an unknown peak to mass spectra stored in the National Institute of Standard and Technology (NIST) library. The reported concentration is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

## Volatile TICs

CLIENT: Tetra Tech NUS

PROJECT: Bravo Pier-Mayport

LOG NUMBER: T930774-6

SAMPLE DESCRIPTION: 0250-SS-GB04

MATRIX: soil

CAS#	Compound	Estimated Concentration
1.	unknown	84000 ug/kg_dw
2.	unknown	760 ug/kg_dw
3.	unknown	650 ug/kg_dw
4.	unknown	1300 ug/kg_dw
5. 2808755	1-methyl-2-methylenecyclohexane	540 ug/kg_dw
6. 21370661	trans-bicyclo[5.1.0]octane	3100 ug/kg_dw
7. 14138	decahydro-2,6-dimethylnaphthalene	2700 ug/kg_dw
8. 4453901	1,4-dihydro-1,4-methanonaphthalene	1900 ug/kg_dw
9.		
10.		

----->>>> No additional TICs detected or searched. <<<<-----

Tentatively Identified Compounds (TICs) are identified by comparison of the spectrum of an unknown peak to mass spectra stored in the National Institute of Standard and Technology (NIST) library. The reported concentration is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

**APPENDIX D**

**PWC LETTER REPORT**

# Building 250 Mayport Florida

29 August – 8 September 99

## PWC JAX Points of Contact

Mr. Jeff Ward, PWC JAX Laboratory, SCAPS liaison

Mr. Jose Deliz, PWC JAX site project manager for bldg's 250 & 285

12 Sept 1999

Enclosures: (1) Site Map  
(2) LIF push files  
(3) Spectral plot sheet

## *Field Notes:*

### **Building 250**

- 1.0 **Sunday, 29 August 1999:** SCAPS crew and equipment departed PWC Norfolk, arrived Mayport Naval Station same day.
- 2.0 **Monday, 30 August 1999:** Field crew set up site at building 250 in accordance with PWC site representative Mr. Jeff Ward. Mr. Ward described the boundaries of the site in accordance with the requirements of Mr. Jose Deliz. The footprint of the site covers the area from the NE and SE corners of building 234, extending directly across to the pier side fence.
- 2.1 SCAPS was required to push 20 LIF pushes within the defined area of the described site in an effort to identify the optimum soil sampling locations.
- 2.2 Utilities were cleared by the host activity, under the direction of PWC JAX.
- 2.3 SCAPS personnel began to establish the grid for the LIF pushes. Approx. 15 push locations were initially cleared.
- 2.4 An initial LIF push was conducted to within approx. 2 feet of an existing temporary monitoring well. Mr. Ward described that the well had been installed and samples taken which helped identify the existence of fuel product in the groundwater table. The LIF location is marked as "Well Push". The well was sounded using an electronic measuring device; Depth To Groundwater (DTW) was recorded to be 4.95<sup>ft</sup> BGS.



**PWC Norfolk, SCAPS**

*"Geologic subsurface investigation is our specialty"*

Review of the LIF data collected from this location gave a representative depiction of the "spectral" signal and the approx. intensity of return signal for a known high concentration of soil/groundwater contamination. Subsequent LIF data would be compared to this "well" data for the purposes of determining possible false positives.

2.5 LIF data was collected at the following locations on Monday:

<i>Location</i>	<i>Depth of "eye"</i>	<i>Comment</i>
1) well push	13.8 <sup>ft</sup>	Positive detect: 175K @ 4.5 BGS
2) 006	8.57 <sup>ft</sup>	Non-detect: False positive
3) 001	8.77 <sup>ft</sup>	Possible detection. Very low intensity
4) 005	10.81 <sup>ft</sup>	Positive detect: 185K @ 4.9 BGS
5) 016	10.74 <sup>ft</sup>	Non-detect
6) 007	11.64 <sup>ft</sup>	Non-detect
7) 009	7.93 <sup>ft</sup>	Non-detect: False positive

\* The "eye" is the spot where laser light and return energy occur on the probe.

2.6 Two hydraulic lines broke at the completion of the LIF push at location #-006. The approx. down time was 3 hours. No data was lost. Repairs, site and equipment clean up were completed by SCAPS personnel.

3.0 Tuesday, 31 August 1999: Completed site set up including the clearing of push locations and, resumed collecting LIF data.

<i>Location</i>	<i>Depth</i>	<i>Comment</i>
1) 017	8.80 <sup>ft</sup>	Non-detect
2) 010	Refusal	Concrete under asphalt
3) 013	8.71 <sup>ft</sup>	Non-detect
4) 013	3.5-5.36 <sup>ft</sup>	Soil sample: PID=0
5) 013	5.36-7.14 <sup>ft</sup>	Soil sample: PID=0
6) 004	10.31 <sup>ft</sup>	Non-detect
7) 011	10.28 <sup>ft</sup>	Non-detect
8) 020	6.73 <sup>ft</sup>	Positive detect: 26,300 @ 5.0 BGS
9) 021	6.18 <sup>ft</sup>	Non-detect: False positive
10) 019	7.15 <sup>ft</sup>	Non-detect: False positive
11) 020	4.0-5.5 <sup>ft</sup>	Soil sample: High odor some staining, head space analysis using PID : #1 jar = 50ppm, #2 jar = 52ppm.
12) 018	9.49 <sup>ft</sup>	Non-detect: False positive

3.1 Initial field results indicated contamination was evident along the NW corner of the UST site, extending out towards building 234. No contamination was identified around any of the other 3 side of where the UST(s) once existed.

3.2 A new series of pushes was established. Push locations previously cleared and numbered, but not yet pushed, were left untouched. Newly identified locations were numbered with the next available numbers ie. Push locations -022 through -028.

3.3 New push locations were located to within close proximity to the three locations with known contamination, "well push", -005 and -020.

4.0 Wednesday, 01 September 1999: Cleared remaining new push locations, and the collection of remaining LIF data. Surveyed all push locations and significant features of site using GPS. Completed elevation survey of site to establish groundwater levels across the site.

4.1 Over the past two days the SCAPS crew had inquired into the history of the UST(s) which were removed from the site. The data being acquired indicated that the contamination was following a linear track. The suspected reasoning was that a utility conduit or duct bank (abandoned or active) which was acting as the transmitter of the fuel. No evidence other than the LIF data indicated this was the case. Two utility lines do cross the site, almost perpendicular to the direction of the contamination. One line is a sewage line the other was unidentified. The approx. depth of the utility lines is commensurate with the depth to groundwater and the existing contamination.

4.2 LIF data collected:

<u>Location</u>	<u>Depth</u>	<u>Comment</u>
1) 021	3.5-5 <sup>ft</sup>	Soil sample: Non detect: PID=0
2) 024	7.06	Non-detect
3) 025	8.23 <sup>ft</sup>	Non-detect
4) 023	9.32 <sup>ft</sup>	Non-detect
5) 026	7.16 <sup>ft</sup>	<b>Positive detect: 130K @ 3.5 BGS</b>
6) 027	6.79 <sup>ft</sup>	Non-detect False positive
7) 028	6.54 <sup>ft</sup>	Non-detect
8) B-1	0-2 <sup>ft</sup>	Soil sample
9) B-2	2-4 <sup>ft</sup>	Soil sample
10) B-3	4-6 <sup>ft</sup>	Soil sample
11) A-1	0-2 <sup>ft</sup>	Soil sample
12) A-2	2-4 <sup>ft</sup>	Soil sample
13) A-3	4-6 <sup>ft</sup>	Soil sample
14) D-1	0-2 <sup>ft</sup>	Soil sample
15) D-2	2-4 <sup>ft</sup>	Soil sample
16) D-3	4-6 <sup>ft</sup>	Soil sample
17) C-1	0-2 <sup>ft</sup>	Soil sample
18) C-2	2-4 <sup>ft</sup>	Soil sample
19) C-3	4-6 <sup>ft</sup>	Soil sample
16) E-1	0-2 <sup>ft</sup>	Soil sample
17) E-2	2-4 <sup>ft</sup>	Soil sample
18) E-3	4-6 <sup>ft</sup>	Soil sample

4.3 LIF push -026 identified significant contamination however, the depth of highest response was approx. 1.5<sup>ft</sup> above the water table as well as the response detected in the adjacent location of the existing monitoring well.

**Finding:**

1.0 The objective of the project was to use LIF data to identify the optimum soil sample locations on the site. Since the contamination was located in such a narrow area and since the contamination was observed to diminish to zero only a few feet from known "hot" spots, the ability to optimize the locations for taking soil samples became a complicated task.

1.1 Totals:

<u>Description</u>	<u>#</u>	<u>Comments</u>
LIF pushes	20	
Refusal pushes	1	Encountered concrete under asphalt. No indication contamination extended to this Point, the push was aborted.
Confirmation soil Samples	4	Location -013 (2) samples, both non-detect Location -020 sample had 50/52 ppm, & heavy odor Location -021 sample was non-detect

<i>Description</i>	<i>#</i>	<i>Comments</i>
Soil samples For analysis by PWC JAX	14	
DTW	N/A	Sounded existing well over the course of the project to Establish existing groundwater level, 4.97ft BGS.

2.0 The determination of groundwater elevations for certain locations provided important information with regard to depth of contamination. The following diagram depicts the results of the elevation survey.

\* Groundwater elevation was established using the DTW measured from the existing well (top of PVC), it was determined to be 4.95' BGS. Then the top of the PVC was surveyed via the level to obtain the DTW to be 9.76.

Location Datum "H" of survey level	-005	-020	-026	-006	-009
	5.68'	5.93'	5.57'	6.08'	5.71'
<b>Depth to GW</b> =	4.08'	3.83'	4.19'	3.68'	4.05'

**Groundwater**  
DTW from survey level = 9.76 for the  
Purpose of this survey

2.1 Depth to groundwater has been transcribed on the LIF push files provided with this letter. Note, the contamination exists below the water table at locations -005, and -020, and above the GW in -026. The false positives detected in locations -006 and -009 were observed below the water table.

2.2 Analysis of the samples revealed a layer of soil below the water table which had small inner-bedded shells. LIF has been known to cause fluorescence of calcium based material such as shells. This material is the most probable cause of the false positive readings observed.

Location	Sample Interval	Sample ID #
B-1	0-2	No sample taken. Sampler tip did not release.
B-2	2-4	99FY01722
B-3	4-6	99FY01723
A-1	1.5-2	99FY01724
A-2	2-4	99FY01725
A-3	4-6	99FY01726
D-1	1.5-2	99FY01727
D-2	2-4	99FY01728
D-3	4-6	99FY01729
C-1	1.5-2	99FY01730
C-2	2-4	99FY01731
C-3	4-6	99FY01732
E-1	0-2	99FY01733
E-2	2-4	99FY01734
E-3	4-6	99FY01735

\* Locations A-1, C-1 and D-1 were pre-punched prior to advancing the sampler downhole.

2.3 The attached spectral plots, enclosure (3), for locations -005, -009, -024, -025 and -027 was put together to help demonstrate the identification of the false positive contacts observed in certain locations.

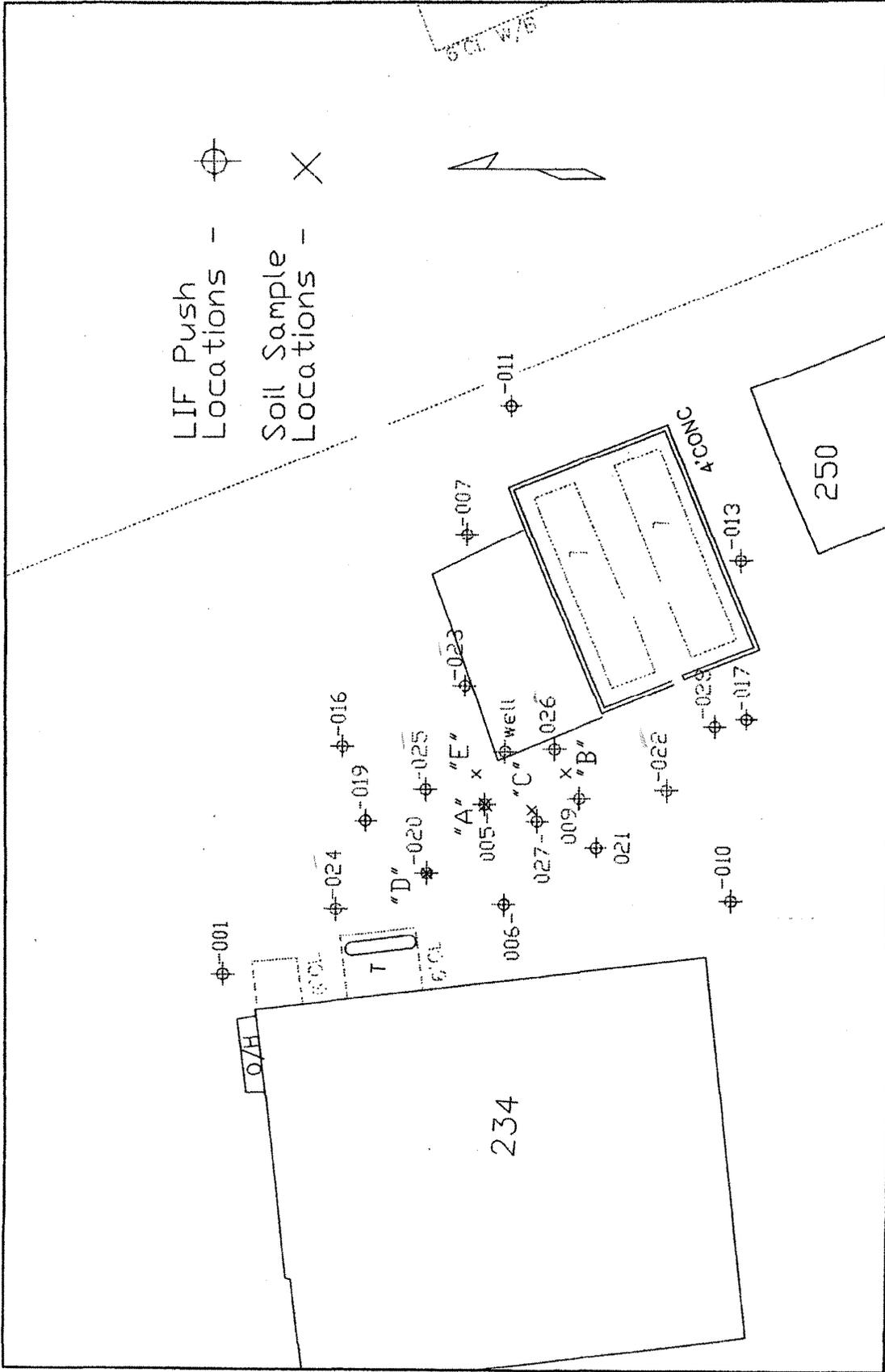
Push location -009 represents the best example of the false positive LIF data observed on this project. The relative intensity goes up at a depth commensurate with the occurrence of the groundwater table. However, when these spectral plots are reviewed beside the known fuel spectra, the difference in fluorescence shapes is observed. Locations -021 and -013 both had similar spectral plots as the other false positive locations. Confirmation samples were collected at these locations since their peak intensities were significant enough to indicate the presence of contamination may exist. No contamination was detected or observed when the samples were collected and field tested.

2.4 Since the SCAPS data identified such a narrow alley where the contamination appeared to exist, there was concern that the inherent errors in the GPS data provided, would make it difficult to be a stand alone survey. The field crew measured the site using a nylon survey tape. The relative distances between push locations which are known to have contamination and the outlining clean LIF and sample locations is provided in the table below:

Distances measured in feet-inches

Location	-006	-009	019	-020	-023	-024	-026	-027	"C"	"E"
-015		20'-1"		38'-9"	19'-9"			20'-4"	17'-4-3/4"	14'-2-1/2"
-020	19'-5-1/2"		19'-4"			21'-7"	20'-6"			
"A"	24'-5"					19'-11"	13'-4"	14'-5"	13'-3"	8'-0"

2.5 The information contained in this document is provided to assist the project managers, customers, in determining the approximate locations of subsurface contamination. The PWC JAX laboratory is processing the soil samples.



NS MAYPORT, FL - SITE 250 SCAPS INVESTIGATION 99-004



July 15, 1999

Service Request No. J9902009

Jeff Ward  
Navy Public Works Center  
Attn: Environmental Lab  
Jacksonville, FL. 32212

Certification Numbers:

Florida DEP: 930298G  
Florida HRS: E82502; 82483  
Massachusetts: M-FL937  
New Hampshire: 294297-A; 294297-B  
North Carolina: 527  
South Carolina: 96021001  
A2LA 0490-02

RE: Project No.: 90234(Impac)  
Project Name: Mayport Bldg 250

Dear Jeff Ward:

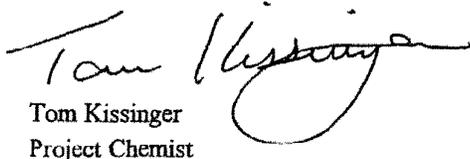
Enclosed are the results of the samples(s) submitted to our laboratory on July 13, 1999. For your reference, these analyses have been assigned our service request number: J9902009.

All analyses were performed according to our laboratory's quality assurance program. All results are intended to be considered in the entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

  
Tom Kissinger  
Project Chemist

TK/jg

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** Navy Public Works Center  
**Project:** PWC Jax / 90327 (Impac)  
**Sample Matrix:** Soil

**Service Request:** J9902630  
**Date Collected:** 9/1/99  
**Date Received:** 9/2/99

Diesel Range Organics (DRO)

**Prep Method:** EPA 3550B  
**Analysis Method:** 8015M  
**Test Notes:**

**Units:** mg/Kg (ppm)  
**Basis:** Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
99FY01722	J9902630-001	10	4	1	9/7/99	9/8/99	200	
99FY01723	J9902630-002	20	4	2	9/7/99	9/8/99	980	
99FY01724	J9902630-003	100	4	10	9/7/99	9/8/99	3000	
99FY01725	J9902630-004	200	4	20	9/7/99	9/8/99	6900	
99FY01726	J9902630-005	200	4	20	9/7/99	9/8/99	8900	
99FY01727	J9902630-006	10	4	1	9/7/99	9/8/99	U	
99FY01728	J9902630-007	10	4	1	9/7/99	9/8/99	U	
99FY01729	J9902630-008	10	4	1	9/7/99	9/8/99	240	
99FY01730	J9902630-009	10	4	1	9/7/99	9/8/99	U	
99FY01731	J9902630-010	10	4	1	9/7/99	9/8/99	U	
99FY01732	J9902630-011	10	4	1	9/7/99	9/8/99	U	
99FY01733	J9902630-012	10	4	1	9/7/99	9/8/99	U	
99FY01734	J9902630-013	10	4	1	9/7/99	9/8/99	U	
99FY01735	J9902630-014	10	4	1	9/7/99	9/8/99	U	
Method Blank	J990907-MB	10	4	1	9/7/99	9/8/99	U	
Lab Control Sample	J990907-LCS	10	4	1	9/7/99	9/8/99	U	
Batch QC	J9902568-007MS	10	4	1	9/7/99	9/8/99	U	
Batch QC	J9902568-007DMS	10	4	1	9/7/99	9/8/99	U	

Approved By: Tom D. Kissinger Date: 9/16/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

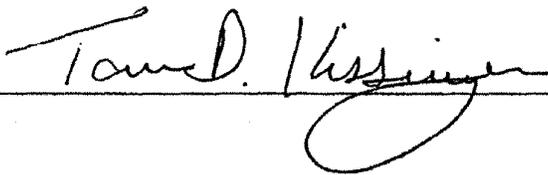
Inorganic Parameters

Sample Name: 99FY01722  
Lab Code: J9902630-01  
Test Notes:

Basis: DRY

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	93.9	

Approved By:



Date:

9/16/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

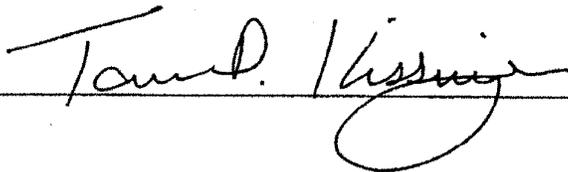
Inorganic Parameters

Sample Name: 99FY01723  
Lab Code: J9902630-02  
Test Notes:

Basis: DRY

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	83.9	

Approved By:



Date:

9/16/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

Inorganic Parameters

Sample Name: 99FY01724  
Lab Code: J9902630-03  
Test Notes:

Basis: DRY

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	95.6	

Approved By:

*Tam D. Hissig*

Date:

*9/16/99*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

Inorganic Parameters

Sample Name: 99FY01725  
Lab Code: J9902630-04  
Test Notes:

Basis: DRY

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	92.9	

Approved By:

*Tamara D. Hession*

Date:

*9/16/99*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

Inorganic Parameters

Sample Name: 99FY01726  
Lab Code: J9902630-05  
Test Notes:

Basis: DRY

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	80.3	

Approved By:

*Tam D. Hissinger*

Date:

*9/16/99*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

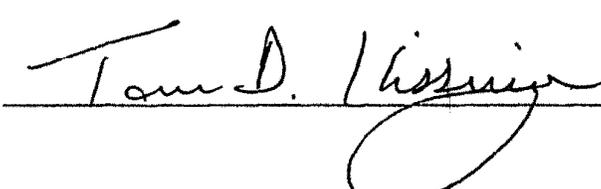
Inorganic Parameters

Sample Name: 99FY01727  
Lab Code: J9902630-06  
Test Notes:

Basis: DRY

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	96.1	

Approved By:



Date:

9/16/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

Inorganic Parameters

Sample Name: 99FY01728  
Lab Code: J9902630-07  
Test Notes:

Basis: DRY

Analyte	Units	Analysis	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
		Method							
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	85.2	

Approved By: Tam D. Hossain Date: 9/16/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

Inorganic Parameters

Sample Name: 99FY01729  
Lab Code: J9902630-08  
Test Notes:

Basis: DRY

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	80.6	

Approved By: \_\_\_\_\_

*Tam D. Hissiny*

Date: \_\_\_\_\_

*9/16/99*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

Inorganic Parameters

Sample Name: 99FY01730  
Lab Code: J9902630-09  
Test Notes:

Basis: DRY

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	94.4	

Approved By:

*Tam D. Hissinger*

Date:

*9/16/99*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

Inorganic Parameters

Sample Name: 99FY01731  
Lab Code: J9902630-10  
Test Notes:

Basis: DRY

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	86	

Approved By:

*Tom D. Hissinger*

Date:

*9/16/99*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

Inorganic Parameters

Sample Name: 99FY01732  
Lab Code: J9902630-11  
Test Notes:

Basis: DRY

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	80.9	

Approved By:

*Tamara D. Hissinger*

Date:

*9/16/99*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

Inorganic Parameters

Sample Name: 99FY01733  
Lab Code: J9902630-12  
Test Notes:

Basis: DRY

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	94.5	

Approved By:

*Tam D. Hissinger*

Date:

*9/16/99*

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

Inorganic Parameters

Sample Name: 99FY01734  
Lab Code: J9902630-13  
Test Notes:

Basis: DRY

Analyte	Units	Analysis		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
		Method								
Solids, Total	PERCENT	160.3		10	10	1	9/3/99	9/3/99	73.3	

Approved By: Tamara D. Harrison Date: 9/16/99

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Navy Public Works Center  
Project: PWC Jax / 90327 (Impac)  
Sample Matrix: Soil

Service Request: J9902630  
Date Collected: 9/1/99  
Date Received: 9/2/99

Inorganic Parameters

Sample Name: 99FY01735  
Lab Code: J9902630-14  
Test Notes:

Basis: DRY

Analyte	Units	Analysis Method	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Solids, Total	PERCENT	160.3	10	10	1	9/3/99	9/3/99	71.5	

Approved By:

*Tamara D. Hissinger*

Date:

*9/16/99*



8540 Baycenter Rd. • Jacksonville, FL 32256 • (904) 739-2277 • 800-695-7222 • FAX (904) 739-2011

# CHAIN OF CUSTODY/LABORATORY ANALYSIS REPORT FORM

DATE \_\_\_\_\_ PAGE \_\_\_\_\_ OF \_\_\_\_\_

PROJECT NAME 90327  
 PROJECT # \_\_\_\_\_  
 COMPANY/ADDRESS PWC JAX  
 PHONE 771-3461  
 REPORT TO: JEFF WARD

SAMPLE I.D.	DATE	TIME	SAMPLE MATRIX	NUMBER OF CONTAINERS	ANALYSIS REQUEST										REMARKS		
99FY01722	9-1-99	1410		1	X												B-2
99FY 01723	" "	1420		1	X												B-3
99FY 01724	" "	1443		1	X												A-1
99FY 01725	" "	1453		1	X												A-2
99FY 01726	" "	1505		1	X												A-3
99FY 01727	" "	1525		1	X												D-1
99FY 01728	" "	1535		1	X												D-2
99FY 01729	" "	1545		1	X												D-3
99FY 01730	" "	1605		1	X												C-1
99FY 01731	" "	1610		1	X												C-2

(2015M) DRO

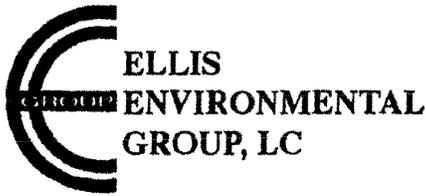
<b>RELINQUISHED BY:</b> Signature: <u>Pete Long</u> Printed Name: <u>Pete Long</u> Firm: <u>PWC Norfolk</u> Date/Time: _____	<b>RECEIVED BY:</b> Signature: <u>Jose R. Deliz</u> Printed Name: <u>Jose R. Deliz</u> Firm: <u>PWC Jax</u> Date/Time: _____	<b>TURNAROUND REQUIREMENTS</b> <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 5 day <input type="checkbox"/> Standard (7-10 working days) <input type="checkbox"/> Provide Verbal Preliminary Results <input type="checkbox"/> Provide FAX Preliminary Results Requested Report Date: _____	<b>REPORT REQUIREMENTS</b> <input type="checkbox"/> I. Routine Report <input type="checkbox"/> II. Report (includes DUP MAS. MSD as required, may be charged as samples) <input type="checkbox"/> III. Data Validation Report (includes All Raw Data) <input type="checkbox"/> IV. CLP Deliverable Report	<b>INVOICE INFORMATION:</b> P.O.# _____ Bill To _____ _____ _____	<b>SAMPLE RECEIPT:</b> Shipping VIA: _____ Shipping to: _____ Condition: _____ Lab No: _____
------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------

<b>RELINQUISHED BY:</b> Signature: <u>Jose R. Deliz</u> Printed Name: <u>Jose R. Deliz</u> Firm: <u>PWC Jax</u> Date/Time: <u>9/2/99 @ 1247</u>	<b>RECEIVED BY:</b> Signature: <u>Jeff S. Ward</u> Printed Name: <u>Jeffrey S. Ward</u> Firm: <u>PWC</u> Date/Time: <u>9/2/99 @ 1247</u>	<b>SPECIAL INSTRUCTIONS/COMMENTS:</b> <u>Received by PWC</u> <u>Don Deliz PWC 9-02-99 1348</u> <u>Jeff Ward CAS 9-02-99 1440</u> <u>Yael Amador CAS</u>	<b>SAMPLER'S SIGNATURE</b> <u>J9902630</u>
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**APPENDIX E**  
**LETTER CLOSURE REPORT**

*Mr. Brian Price / PM*



414 SW 140th Terrace  
Newberry, FL 32669-5400  
Phone (352) 332-3888  
Fax (352) 332-3222  
ellisenv.com

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December 17, 2002

City of Jacksonville, FL  
Regulatory and Environmental Services Department  
Air and Water Quality Division  
City Hall at St. James  
117 W. Duval St., Suite 225  
Jacksonville, FL 32202

Attn: Tom Griffin  
Environmental Scientist

Re: Letter Closure Report  
Removal of ASTs 250 No.1 and No.2  
Naval Station Mayport  
Mayport, FL

Dear Mr. Griffin:

Ellis Environmental Group, LC (EEG) is pleased to provide a Letter Closure Report for the Removal of Aboveground Storage Tanks (ASTs) 250 No. 1 and No.2 from Naval Station Mayport, Florida. The details of this removal action are as follows.

#### **Introduction**

On September 26, 2002, EEG was awarded a contract to remove two (2) 30,000-gallon ASTs in the vicinity of the previously removed Building 250 at Naval Station Mayport, Florida.

After completing contract submittal documents and attending a pre-construction meeting on October 15, 2002, EEG mobilized to the site on Monday, November 4, 2002, and completed tank and piping removal on Friday, November 8, 2002. The remainder of the project, including site restoration, was completed on Friday, December 6, 2002.

#### **Site History**

Naval Station Mayport is located near the mouth of the St. Johns River and is accessible from Atlantic Boulevard and Mayport Road. The installation consists of post-World War II facilities as well as training, ship support, and dock areas. The installation is located on a very flat sandy terrain with little or no slope. The St. Johns River forms the northern border of the naval station. The installation is completely serviced with wastewater and stormwater collection and control systems that prevent surcharge or migratory discharge into the inland waterway (see Figure 1 for site location and Figure 2 for tank location).

The two (2) 30,000-gallon ASTs were installed at Building 250 as a storage system for waste oils prior to burning those oils in a boiler that provided both steam and hot water for the naval facility. The exact date of the installation is unknown.

The use of these ASTs as a storage system for heating oils renders these tanks a “non-regulated” item for the purposes of reporting and removal under FAC 62-770.

On Tuesday, October 22, 2002, Bill Mack of the City of Jacksonville was notified of the pending removal of these tanks. Mr. Mack indicated that a letter closure report should be sent to Tom Griffin, environmental scientist at the City of Jacksonville Regulatory and Environmental Services Department.

### **Aboveground Storage Tank Removal**

The AST removal process commenced on Monday, November 4, 2002. On that date, two hundred (200) gallons of spent fuel oil (diesel) and rainwater were removed from the two tanks by a vacuum truck by EEG subcontractor Marine Industrial Services (MIS). The fuel oil and water mixture was transported to Industrial Water Services by MIS for treatment and disposal. A copy of Manifest Document No. 12173 is included with this closure letter as Attachment 1.

The tank and pipe cleaning process was executed by MIS from Tuesday, November 5, 2002, through Thursday, November 7, 2002. One thousand six hundred (1,600) gallons of piping and tank wash water was collected. On Friday, November 8, 2002, this petroleum-contaminated wash water was taken to Industrial Water Services for treatment and disposal by MIS. A copy of Manifest Document No. 12174 is included with this closure letter as Attachment 2.

On Thursday, November 7, 2002, EEG engineer John D. Scott (FL PE #30327) used an LEL/oxygen meter to test and certify that both tanks were inert. The ends of the tanks were cut, rendering them unusable, and all piping was removed on the same day.

On November 7, 2002, the piping was taken to Berman Metals in Jacksonville, Florida. The tanks were taken to Commercial Metals in Jacksonville, Florida, on November 8, 2002. Certification of proper disposal of the tanks and the piping is contained in a letter from MIS to EEG dated December 3, 2002. This letter is provided as Attachment 3.

### **Site Restoration**

Concrete and foundation removal commenced on Monday, November 11, 2002, and was completed on Friday, November 22, 2002.

Curb restoration and site fill/grading was completed on Wednesday, November 27, 2002.

Site sodding (Argentine Bahia) was completed on Wednesday, November 27, 2002, and final fencing and site restoration per the plans and specifications were completed on Friday, December 6, 2002.

### **Summary and Conclusions**

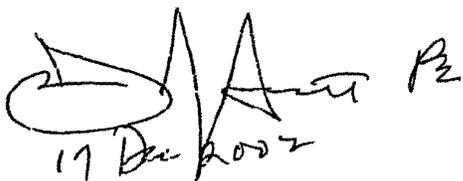
The removal and site restoration of ASTs 250 No. 1 and No. 2 were uneventful. The tank contents and wastewater were disposed of properly and tracked by individual waste manifests. The site was restored to

specified grades and sodded. The area was fenced and the new fencing was tied to existing fencing. This removal action should be considered a clean closure and should require no further action.

Should you have any questions or comments or require any additional information in the interim, please advise.

EEG appreciates the opportunity to provide these professional services and it has been a pleasure working with all parties concerned with this project.

Sincerely,  
**ELLIS ENVIRONMENTAL GROUP, LC**

A handwritten signature in black ink, appearing to read "Jack Scott PE", with the date "17 Dec 2002" written below it.

John D. (Jack) Scott, PE  
Florida PE #30327

cc: Brian Price, Project Manager  
Jan Bovier, Mayport Environmental  
Conrad Mueller, CSR

Enclosures

**NON-HAZARDOUS  
WASTE MANIFEST**

1. Generator's US EPA ID No.

Manifest Doc. No.

2. Page 1 of

12173

6014

3. Generator's Name and Mailing Address

US NAVY  
NAVALYARDS  
MANFORD FL

210

4. Generator's Phone (321) 330-1178

5. Transporter 1 Company Name

MARINE INDUSTRIAL SERVICES INC.

6. US EPA ID Number

FLD032383945

A. Transporter's Phone

804-350-0006

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

INDUSTRIAL WATER SERVICES  
1116 TULLYBANS AVE  
JACKSONVILLE FL 32216

10. US EPA ID Number

11LD081928484

C. Facility's Phone

(904) 354-0372

11. Waste Shipping Name and Description

a. DIESEL & RAINWATER

12. Containers

No.

Type

13. Total Quantity

14. Unit Wt/Vol

001 VT 200 GAL

b. 200 gallons pumped from Tanks No. 1 & No. 2

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

GENERATOR

TRANSPORTER

FACILITY

GENERATOR'S COPY

**NON-HAZARDOUS WASTE MANIFEST**

1. Generator's US EPA ID No.

Manifest Doc. No. **12174**

2. Page 1 of

**6014**

3. Generator's Name and Mailing Address

**5111 F...**

**North, FL 32169**

**210**

4. Generator's Phone (32) 332-7222

5. Transporter 1 Company Name

**MARINE INDUSTRIAL SERVICES INC.**

6. US EPA ID Number

**FLD032383945**

A. Transporter's Phone

**904-350-0006**

7. Transporter 2 Company Name

8. US EPA ID Number

B. Transporter's Phone

9. Designated Facility Name and Site Address

**I. J. ...**  
**1610 ...**  
**FL ...**

10. US EPA ID Number

**FL12181328481**

C. Facility's Phone

**3510372**

11. Waste Shipping Name and Description

12. Containers  
No. Type

13. Total Quantity

14. Unit Wt/Vol

a. **Petroleum Cont. + WATER**

**0.01 NT 1600 GAL**

b. **Wash Water From Piping and Tanks 1600 gallons**

c.

d.

D. Additional Descriptions for Materials Listed Above

E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name

Signature

Month Day Year

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name

Signature

Month Day Year

GENERATOR

TRANSPORTER

FACILITY

GENERATOR'S COPY

**MIS** Marine Industrial Services, Inc.

P.O. Box 43175  
Jacksonville, FL  
32203-3175  
(904) 350-0006

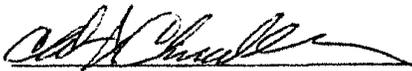
3 December 2002

Ellis Environmental Group, LLC  
414 SW 140<sup>th</sup> Terrace  
Newberry, FL 32669

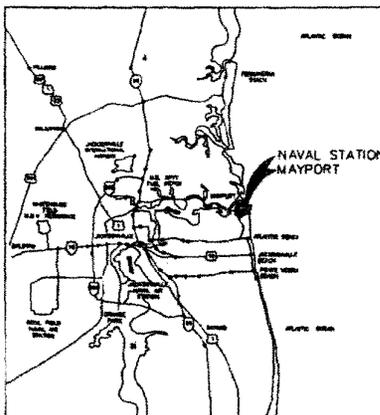
**Attn: Jack Scott**

Subj: N69272-02-C-2022, Bldg 259, and Mayport, NS

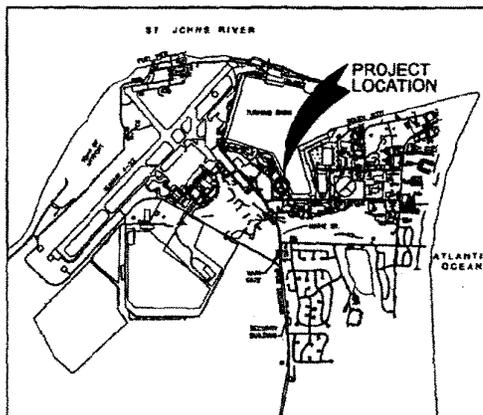
Marine Industrial Services, Inc. certifies that the tanks were disposed of at Commercial Metals and the piping was disposed of at Berman metals.

  
Clark Chandler, Projects Manager

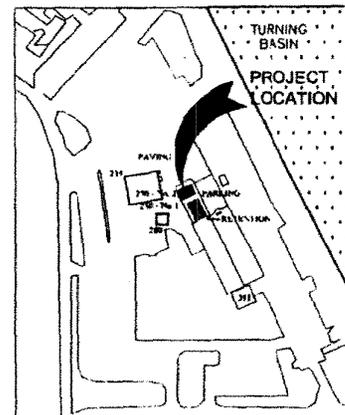
# REMOVE ABOVE GROUND STORAGE TANKS 250 NO. 1 & 250 NO. 2 NAVAL STATION MAYPORT, FLORIDA



VICINITY MAP  
NOT TO SCALE  
PROJECT LOCATION



BASE MAP  
NOT TO SCALE  
LOCATION OF WORK



PROJECT LOCATION MAP  
NOT TO SCALE  
LOCATION OF WORK



NAVFAC DWG NO.	PAGE	SHEET	SHEET TITLE
5380544	1	T-1	TITLE SHEET
5380545	2	D-1	DEMOLITION NOTES
5380546	3	D-2	SITE DEMOLITION PLAN
5380547	4	D-3	SITE PLAN - EXISTING
5380548	5	D-4	SIDE ELEVATIONS
5380549	6	D-5	END ELEVATIONS
5380550	7	D-6	SECTIONS
5380551	8	A-1	NEW SITE PLAN

REDUCED DRAWING - USE GRAPHIC SCALE

<p>REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 10%;">NO.</td><td style="width: 40%;">DESCRIPTION</td><td style="width: 10%;">DATE</td><td style="width: 10%;">BY</td><td style="width: 10%;">CHKD</td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	NO.	DESCRIPTION	DATE	BY	CHKD																					<p>NAVFAC PROJECT NO. 5380544</p> <p>NAVAL STATION MAYPORT, FLA.</p> <p>REMOVE ABOVE GROUND STORAGE TANKS 250 NO. 1 &amp; 250 NO. 2</p> <p style="text-align: center;">TITLE COVER SHEET</p> <p>DATE: 07/11/83</p>
NO.	DESCRIPTION	DATE	BY	CHKD																						

10000000-07-C-7027      07-09-1028      5380544      1 of 8

T-1

Figure 1



**APPENDIX F**  
**FLUCL OUTPUT**

*Naphthalene (using average laboratory values)*

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.*

**Summary Statistics for Naphthalene**

Number of Samples	39
Number of Censored Data	36
Minimum	0.635
Maximum	9.85
Mean	0.335
Median	0.05
Standard Deviation	1.575
Variance	
Coefficient of Variation	4.7
Skewness	6.11

**95% UCL (Assuming Normal Data)**

Student's-t	NA
-------------	----

**95% UCL (Adjusted for Skewness)**

Adjusted-CLT	NA
Modified-t	NA

**95% Non-parametric UCL**

CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	NA

**95% Bounding Method UCL**

Bounding (Max)	1.435
Bounding (1/2 DL)	1.418

**Summary Statistics for Naphthalene**

Minimum	NA
Maximum	NA
Mean	NA
Standard Deviation	NA
Variance	NA

**Goodness-of-Fit Results**

Distribution Recommended	NA
Distribution Used	Neither

**Estimates Assuming Lognormal Distribution**

MLE Mean	NA
MLE Standard Deviation	NA
MLE Median	NA
MLE Coefficient of Variation	NA
MVUE Estimate of Mean	NA
MVUE Estimate of Std. Dev.	NA
MVUE Estimate of SE	NA
MVUE Coefficient of Variation	NA

**UCL Assuming Lognormal Distribution**

95% H-UCL	NA
95% Chebyshev (MVUE) UCL	NA
99% Chebyshev (MVUE) UCL	NA

**FDEP Recommended UCL to Use:**

**1.435**

PROUCL      NA

Note: These estimates are valid ONLY if samples are random and representative.

**Naphthalene (using average laboratory values minus excavated area)**

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.*

**Summary Statistics for Naphthalene**

Number of Samples	34
Number of Censored Data	31
Minimum	0.072999999
Maximum	9.85
Mean	0.347
Median	0.050000001
Standard Deviation	1.682
Variance	
Coefficient of Variation	4.846
Skewness	5.798

**95% UCL (Assuming Normal Data)**

Student's-t	NA
-------------	----

**95% UCL (Adjusted for Skewness)**

Adjusted-CLT	NA
Modified-t	NA

**95% Non-parametric UCL**

CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	NA

**95% Bounding Method UCL**

Bounding (Max)	1.605
Bounding (1/2 DL)	1.588

**Summary Statistics for Naphthalene**

Minimum	NA
Maximum	NA
Mean	NA
Standard Deviation	NA
Variance	NA

**Goodness-of-Fit Results**

Distribution Recommended	NA
Distribution Used	Neither

**Estimates Assuming Lognormal Distribution**

MLE Mean	NA
MLE Standard Deviation	NA
MLE Median	NA
MLE Coefficient of Variation	NA
MVUE Estimate of Mean	NA
MVUE Estimate of Std. Dev.	NA
MVUE Estimate of SE	NA
MVUE Coefficient of Variation	NA

**UCL Assuming Lognormal Distribution**

95% H-UCL	NA
95% Chebyshev (MVUE) UCL	NA
99% Chebyshev (MVUE) UCL	NA

**FDEP Recommended UCL to Use:**

**1.605**

PROUCL      NA

Note: These estimates are valid ONLY if samples are random and representative.

**Naphthalene (using highest laboratory values)**

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.*

**Summary Statistics for Naphthalene**

Number of Samples	39
Number of Censored Data	36
Minimum	1
Maximum	15
Mean	0.477
Median	0.05
Standard Deviation	2.397
Variance	
Coefficient of Variation	5.028
Skewness	6.161

**95% UCL (Assuming Normal Data)**

Student's-t	NA
-------------	----

**95% UCL (Adjusted for Skewness)**

Adjusted-CLT	NA
Modified-t	NA

**95% Non-parametric UCL**

CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	NA

**95% Bounding Method UCL**

Bounding (Max)	2.150
Bounding (1/2 DL)	2.133

**Summary Statistics for Naphthalene**

Minimum	NA
Maximum	NA
Mean	NA
Standard Deviation	NA
Variance	NA

**Goodness-of-Fit Results**

Distribution Recommended	NA
Distribution Used	Neither

**Estimates Assuming Lognormal Distribution**

MLE Mean	NA
MLE Standard Deviation	NA
MLE Median	NA
MLE Coefficient of Variation	NA

MVUE Estimate of Mean	NA
MVUE Estimate of Std. Dev.	NA
MVUE Estimate of SE	NA
MVUE Coefficient of Variation	NA

**UCL Assuming Lognormal Distribution**

95% H-UCL	NA
95% Chebyshev (MVUE) UCL	NA
99% Chebyshev (MVUE) UCL	NA

**FDEP Recommended UCL to Use:**

**2.150**

PROUCL      NA

Note: These estimates are valid ONLY if samples are random and representative.

**Naphthalene (using highest laboratory values minus excavated area)**

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.*

**Summary Statistics for Naphthalene**

Number of Samples	34
Number of Censored Data	31
Minimum	0.073
Maximum	15
Mean	0.51
Median	0.05
Standard Deviation	2.57
Variance	
Coefficient of Variation	5.035
Skewness	5.794

**95% UCL (Assuming Normal Data)**

Student's-t	NA
-------------	----

**95% UCL (Adjusted for Skewness)**

Adjusted-CLT	NA
Modified-t	NA

**95% Non-parametric UCL**

CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	NA

**95% Bounding Method UCL**

Bounding (Max)	2.428
Bounding (1/2 DL)	2.411

**Summary Statistics for Naphthalene**

Minimum	NA
Maximum	NA
Mean	NA
Standard Deviation	NA
Variance	NA

**Goodness-of-Fit Results**

Distribution Recommended	NA
Distribution Used	Neither

**Estimates Assuming Lognormal Distribution**

MLE Mean	NA
MLE Standard Deviation	NA
MLE Median	NA
MLE Coefficient of Variation	NA
MVUE Estimate of Mean	NA
MVUE Estimate of Std. Dev.	NA
MVUE Estimate of SE	NA
MVUE Coefficient of Variation	NA

**UCL Assuming Lognormal Distribution**

95% H-UCL	NA
95% Chebyshev (MVUE) UCL	NA
99% Chebyshev (MVUE) UCL	NA

**FDEP Recommended UCL to Use:**

**2.428**

PROUCL      NA

Note: These estimates are valid ONLY if samples are random and representative.

**1-Methylnaphthalene (using average laboratory values)**

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.*

**Summary Statistics for 1-Methylnaphthalene**

Number of Samples	39
Number of Censored Data	36
Minimum	2.2
Maximum	40.5
Mean	1.284
Median	0.05
Standard Deviation	6.519
Variance	
Coefficient of Variation	5.08
Skewness	6.04

**95% UCL (Assuming Normal Data)**

Student's-t	NA
-------------	----

**95% UCL (Adjusted for Skewness)**

Adjusted-CLT	NA
Modified-t	NA

**95% Non-parametric UCL**

CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	NA

**95% Bounding Method UCL**

Bounding (Max)	5.835
Bounding (1/2 DL)	5.789

**Summary Statistics for 1-Methylnaphthalene**

Minimum	NA
Maximum	NA
Mean	NA
Standard Deviation	NA
Variance	NA

**Goodness-of-Fit Results**

Distribution Recommended	NA
Distribution Used	Neither

**Estimates Assuming Lognormal Distribution**

MLE Mean	NA
MLE Standard Deviation	NA
MLE Median	NA
MLE Coefficient of Variation	NA
MVUE Estimate of Mean	NA
MVUE Estimate of Std. Dev.	NA
MVUE Estimate of SE	NA
MVUE Coefficient of Variation	NA

**UCL Assuming Lognormal Distribution**

95% H-UCL	NA
95% Chebyshev (MVUE) UCL	NA
99% Chebyshev (MVUE) UCL	NA

**FDEP Recommended UCL to Use:**

**5.835**

PROUCL      NA

Note: These estimates are valid ONLY if samples are random and representative.

**1-Methylnaphthalene (using average laboratory values minus excavated area)**

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.*

<u>Summary Statistics for 1-Methylnaphthalene</u>		<u>Summary Statistics for 1-Methylnap</u>	
Number of Samples	34	Minimum	NA
Number of Censored Data	31	Maximum	NA
Minimum	0.10	Mean	NA
Maximum	40.5	Standard Deviation	NA
Mean	1.405	Variance	NA
Median	0.05		
Standard Deviation	6.979	<b><u>Goodness-of-Fit Results</u></b>	
Variance		Distribution Recommended	NA
Coefficient of Variation	4.969	Distribution Used	Neither
Skewness	5.660		
<b><u>95% UCL (Assuming Normal Data)</u></b>		<b><u>Estimates Assuming Lognormal Distributio</u></b>	
Student's-t	NA	MLE Mean	NA
		MLE Standard Deviation	NA
		MLE Median	NA
		MLE Coefficient of Variation	NA
		MVUE Estimate of Mean	NA
		MVUE Estimate of Std. Dev.	NA
		MVUE Estimate of SE	NA
		MVUE Coefficient of Variation	NA
		<b><u>UCL Assuming Lognormal Distribution</u></b>	
		95% H-UCL	NA
		95% Chebyshev (MVUE) UCL	NA
		99% Chebyshev (MVUE) UCL	NA
		<b><u>FDEP Recommended UCL to Use:</u></b>	
		<b>6.622</b>	
		PROUCL	NA
<b><u>95% UCL (Adjusted for Skewness)</u></b>			
Adjusted-CLT	NA		
Modified-t	NA		
<b><u>95% Non-parametric UCL</u></b>			
CLT	NA		
Jackknife	NA		
Standard Bootstrap	NA		
Bootstrap-t	NA		
Chebyshev (Mean, Std)	NA		
<b><u>95% Bounding Method UCL</u></b>			
Bounding (Max)	6.622		
Bounding (1/2 DL)	6.606		

Note: These estimates are valid ONLY if samples are random and representative.

**1-Methylnaphthalene (using highest laboratory values)**

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.*

<b>Summary Statistics for 1-Methylnaphthalene</b>	
Number of Samples	39
Number of Censored Data	36
Minimum	2.2
Maximum	54
Mean	1.635
Median	0.05
Standard Deviation	8.664
Variance	
Coefficient of Variation	5.298
Skewness	6.121

<b>95% UCL (Assuming Normal Data)</b>	
Student's-t	NA

<b>95% UCL (Adjusted for Skewness)</b>	
Adjusted-CLT	NA
Modified-t	NA

<b>95% Non-parametric UCL</b>	
CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	NA

<b>95% Bounding Method UCL</b>	
Bounding (Max)	7.683
Bounding (1/2 DL)	7.638

<b>Summary Statistics for 1-Methylnaphthalene</b>	
Minimum	NA
Maximum	NA
Mean	NA
Standard Deviation	NA
Variance	NA

<b>Goodness-of-Fit Results</b>	
Distribution Recommended	NA
Distribution Used	Neither

<b>Estimates Assuming Lognormal Distribution</b>	
MLE Mean	NA
MLE Standard Deviation	NA
MLE Median	NA
MLE Coefficient of Variation	NA

MVUE Estimate of Mean	NA
MVUE Estimate of Std. Dev.	NA
MVUE Estimate of SE	NA
MVUE Coefficient of Variation	NA

<b>UCL Assuming Lognormal Distribution</b>	
95% H-UCL	NA
95% Chebyshev (MVUE) UCL	NA
99% Chebyshev (MVUE) UCL	NA

<b>FDEP Recommended UCL to Use:</b>	
	<b>7.683</b>

PROUCL      NA

Note: These estimates are valid ONLY if samples are random and representative.

**1-Methylnaphthalene (using highest laboratory values minus excavated area)**

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.*

<b>Summary Statistics for 1-Methylnaphthalene</b>	
Number of Samples	34
Number of Censored Data	31
Minimum	0.10
Maximum	54
Mean	1.807
Median	0.050
Standard Deviation	9.279
Variance	
Coefficient of Variation	5.136
Skewness	5.727

<b>95% UCL (Assuming Normal Data)</b>	
Student's-t	NA

<b>95% UCL (Adjusted for Skewness)</b>	
Adjusted-CLT	NA
Modified-t	NA

<b>95% Non-parametric UCL</b>	
CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	NA

<b>95% Bounding Method UCL</b>	
Bounding (Max)	8.743
Bounding (1/2 DL)	8.726

<b>Summary Statistics for 1-Methylnaphthalene</b>	
Minimum	NA
Maximum	NA
Mean	NA
Standard Deviation	NA
Variance	NA

<b>Goodness-of-Fit Results</b>	
Distribution Recommended	NA
Distribution Used	Neither

<b>Estimates Assuming Lognormal Distribution</b>	
MLE Mean	NA
MLE Standard Deviation	NA
MLE Median	NA
MLE Coefficient of Variation	NA

MVUE Estimate of Mean	NA
MVUE Estimate of Std. Dev.	NA
MVUE Estimate of SE	NA
MVUE Coefficient of Variation	NA

<b>UCL Assuming Lognormal Distribution</b>	
95% H-UCL	NA
95% Chebyshev (MVUE) UCL	NA
99% Chebyshev (MVUE) UCL	NA

<b>FDEP Recommended UCL to Use:</b>	
	<b>8.743</b>

PROUCL      NA

Note: These estimates are valid ONLY if samples are random and representative.

**2-Methylnaphthalene (using average laboratory values)**

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.*

<b>Summary Statistics for 2-Methylnaphthalene</b>	
Number of Samples	39
Number of Censored Data	35
Minimum	0.130
Maximum	45.5
Mean	1.384
Median	0.05
Standard Deviation	7.296
Variance	
Coefficient of Variation	5.271
Skewness	6.130

<b>95% UCL (Assuming Normal Data)</b>	
Student's-t	NA

<b>95% UCL (Adjusted for Skewness)</b>	
Adjusted-CLT	NA
Modified-t	NA

<b>95% Non-parametric UCL</b>	
CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	NA

<b>95% Bounding Method UCL</b>	
Bounding (Max)	6.476
Bounding (1/2 DL)	6.432

<b>Summary Statistics for 2-Methylnaphth</b>	
Minimum	NA
Maximum	NA
Mean	NA
Standard Deviation	NA
Variance	NA

<b>Goodness-of-Fit Results</b>	
Distribution Recommended	NA
Distribution Used	Neither

<b>Estimates Assuming Lognormal Distributor</b>	
MLE Mean	NA
MLE Standard Deviation	NA
MLE Median	NA
MLE Coefficient of Variation	NA
MVUE Estimate of Mean	NA
MVUE Estimate of Std. Dev.	NA
MVUE Estimate of SE	NA
MVUE Coefficient of Variation	NA

<b>UCL Assuming Lognormal Distribution</b>	
95% H-UCL	NA
95% Chebyshev (MVUE) UCL	NA
99% Chebyshev (MVUE) UCL	NA

<b>FDEP Recommended UCL to Use:</b>	
	<b>6.476</b>

PROUCL      NA

Note: These estimates are valid ONLY if samples are random and representative.

**2-Methylnaphthalene (using average laboratory values minus excavated area)**

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.*

<b>Summary Statistics for 2-Methylnaphthalene</b>	
Number of Samples	34
Number of Censored Data	31
Minimum	0.130
Maximum	45.5
Mean	1.518
Median	0.050
Standard Deviation	7.812
Variance	
Coefficient of Variation	5.145
Skewness	5.740

<b>95% UCL (Assuming Normal Data)</b>	
Student's-t	NA

<b>95% UCL (Adjusted for Skewness)</b>	
Adjusted-CLT	NA
Modified-t	NA

<b>95% Non-parametric UCL</b>	
CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	NA

<b>95% Bounding Method UCL</b>	
Bounding (Max)	7.358
Bounding (1/2 DL)	7.342

<b>Summary Statistics for 2-Methylnaphthalene</b>	
Minimum	NA
Maximum	NA
Mean	NA
Standard Deviation	NA
Variance	NA

<b>Goodness-of-Fit Results</b>	
Distribution Recommended	NA
Distribution Used	Neither

<b>Estimates Assuming Lognormal Distribution</b>	
MLE Mean	NA
MLE Standard Deviation	NA
MLE Median	NA
MLE Coefficient of Variation	NA

MVUE Estimate of Mean	NA
MVUE Estimate of Std. Dev.	NA
MVUE Estimate of SE	NA
MVUE Coefficient of Variation	NA

<b>UCL Assuming Lognormal Distribution</b>	
95% H-UCL	NA
95% Chebyshev (MVUE) UCL	NA
99% Chebyshev (MVUE) UCL	NA

<b>FDEP Recommended UCL to Use:</b>	
	<b>7.358</b>

PROUCL      NA

Note: These estimates are valid ONLY if samples are random and representative.

**2-Methylnaphthalene (using highest laboratory values)**

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.*

**Summary Statistics for 2-Methylnaphthalene**

Number of Samples	39
Number of Censored Data	35
Minimum	0.130
Maximum	62
Mean	1.807
Median	0.050
Standard Deviation	9.926
Variance	
Coefficient of Variation	5.491
Skewness	6.182

**95% UCL (Assuming Normal Data)**

Student's-t	NA
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**95% UCL (Adjusted for Skewness)**

Adjusted-CLT	NA
Modified-t	NA

**95% Non-parametric UCL**

CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	NA

**95% Bounding Method UCL**

Bounding (Max)	8.735
Bounding (1/2 DL)	8.692

**Summary Statistics for 2-Methylnaphthalene**

Minimum	NA
Maximum	NA
Mean	NA
Standard Deviation	NA
Variance	NA

**Goodness-of-Fit Results**

Distribution Recommended	NA
Distribution Used	Neither

**Estimates Assuming Lognormal Distribution**

MLE Mean	NA
MLE Standard Deviation	NA
MLE Median	NA
MLE Coefficient of Variation	NA
MVUE Estimate of Mean	NA
MVUE Estimate of Std. Dev.	NA
MVUE Estimate of SE	NA
MVUE Coefficient of Variation	NA

**UCL Assuming Lognormal Distribution**

95% H-UCL	NA
95% Chebyshev (MVUE) UCL	NA
99% Chebyshev (MVUE) UCL	NA

**FDEP Recommended UCL to Use:**

**8.735**

PROUCL      NA

Note: These estimates are valid ONLY if samples are random and representative.

**2-Methylnaphthalene (using highest laboratory values minus excavated area)**

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.*

<b>Summary Statistics for 2-Methylnaphthalene</b>	
Number of Samples	34
Number of Censored Data	31
Minimum	0.130
Maximum	62
Mean	2.00
Median	0.05
Standard Deviation	10.63
Variance	
Coefficient of Variation	5.305
Skewness	5.781

<b>95% UCL (Assuming Normal Data)</b>	
Student's-t	NA

<b>95% UCL (Adjusted for Skewness)</b>	
Adjusted-CLT	NA
Modified-t	NA

<b>95% Non-parametric UCL</b>	
CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	NA

<b>95% Bounding Method UCL</b>	
Bounding (Max)	9.951
Bounding (1/2 DL)	9.935

<b>Summary Statistics for 2-Methylnaphthl</b>	
Minimum	NA
Maximum	NA
Mean	NA
Standard Deviation	NA
Variance	NA

<b>Goodness-of-Fit Results</b>	
Distribution Recommended	NA
Distribution Used	Neither

<b>Estimates Assuming Lognormal Distribution</b>	
MLE Mean	NA
MLE Standard Deviation	NA
MLE Median	NA
MLE Coefficient of Variation	NA

MVUE Estimate of Mean	NA
MVUE Estimate of Std. Dev.	NA
MVUE Estimate of SE	NA
MVUE Coefficient of Variation	NA

<b>UCL Assuming Lognormal Distribution</b>	
95% H-UCL	NA
95% Chebyshev (MVUE) UCL	NA
99% Chebyshev (MVUE) UCL	NA

<b>FDEP Recommended UCL to Use:</b>	
<b>9.951</b>	

PROUCL      NA

Note: These estimates are valid ONLY if samples are random and representative.

*TRPH (using average laboratory values)*

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Results reflect censored parameter estimations based on distributional assumptions.*

<b>Censor Estimated Statistics for TRPH</b>	
Number of Samples	39
Number of Censored Data	16
Minimum Non-censored	5.3
Maximum	12000
Mean	NA
Median	NA
Standard Deviation	NA
Variance	NA
Coefficient of Variation	NA
Skewness	NA

<b>95% UCL (Assuming Normal Data)</b>	
Student's-t	NA

<b>95% UCL (Adjusted for Skewness)</b>	
Adjusted-CLT	NA
Modified-t	NA

<b>95% Non-parametric UCL</b>	
CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	2336.9

<b>Censor Estimated Statistics for TRPH</b>	<b>ln()</b>
Minimum	0.742
Maximum	9.393
Mean	2.613
Standard Deviation	3.194
Variance	10.199
Fit	0.986

<b>Goodness-of-Fit Results</b>	
Distribution Recommended	Lognormal
Distribution Used	Lognormal

<b>Estimates Assuming Lognormal Distribution</b>	
MLE Mean	2234.67
MLE Standard Deviation	366278.9
MLE Median	13.633
MLE Coefficient of Variation	163.908
MVUE Estimate of Mean	901.837
MVUE Estimate of Std. Dev.	10196.821
MVUE Estimate of SE	733.012
MVUE Coefficient of Variation	11.307

<b>UCL Assuming Lognormal Distribution</b>	
95% H-UCL	39240.21
95% Chebyshev (MVUE) UCL	4096.96
99% Chebyshev (MVUE) UCL	8195.229

**FDEP Recommended UCL to Use:**  
**2336.9**

PROUCL NA

Note: These estimates are valid ONLY if samples are random and representative.

*TRPH (using average laboratory values minus excavated area)*

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Results reflect censored parameter estimations based on distributional assumptions.*

<b>Censor Estimated Statistics for TRPH</b>	
Number of Samples	34
Number of Censored Data	16
Minimum Non-censored	5.3
Maximum	4120
Mean	NA
Median	NA
Standard Deviation	NA
Variance	NA
Coefficient of Variation	NA
Skewness	NA

<b>95% UCL (Assuming Normal Data)</b>	
Student's-t	NA

<b>95% UCL (Adjusted for Skewness)</b>	
Adjusted-CLT	NA
Modified-t	NA

<b>95% Non-parametric UCL</b>	
CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	886.8

<b>Censor Estimated Statistics for TRPH In()</b>	
Minimum	0.742
Maximum	8.324
Mean	2.292
Standard Deviation	2.800
Variance	7.839
Fit	0.986

<b>Goodness-of-Fit Results</b>	
Distribution Recommended	Lognormal
Distribution Used	Lognormal

<b>Estimates Assuming Lognormal Distribution</b>	
MLE Mean	498.220
MLE Standard Deviation	25092.979
MLE Median	9.890
MLE Coefficient of Variation	50.365
MVUE Estimate of Mean	241.387
MVUE Estimate of Std. Dev.	1547.938
MVUE Estimate of SE	184.746
MVUE Coefficient of Variation	6.413

<b>UCL Assuming Lognormal Distribution</b>	
95% H-UCL	5845.795
95% Chebyshev (MVUE) UCL	1046.676
99% Chebyshev (MVUE) UCL	2079.591

**FDEP Recommended UCL to Use:**  
**886.8**

PROUCL NA

Note: These estimates are valid ONLY if samples are random and representative.

**TRPH (using highest laboratory values)**

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Results reflect censored parameter estimations based on distributional assumptions.*

<b>Censor Estimated Statistics for TRPH</b>	
Number of Samples	39
Number of Censored Data	16
Minimum Non-censored	5.3
Maximum	12000
Mean	NA
Median	NA
Standard Deviation	NA
Variance	NA
Coefficient of Variation	NA
Skewness	NA

<b>95% UCL (Assuming Normal Data)</b>	
Student's-t	NA

<b>95% UCL (Adjusted for Skewness)</b>	
Adjusted-CLT	NA
Modified-t	NA

<b>95% Non-parametric UCL</b>	
CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	2659.18

<b>Censor Estimated Statistics for TRPH In()</b>	
Minimum	0.742
Maximum	9.393
Mean	2.637
Standard Deviation	3.271
Variance	10.701
Fit	0.982

<b>Goodness-of-Fit Results</b>	
Distribution Recommended	Lognormal
Distribution Used	Lognormal

<b>Estimates Assuming Lognormal Distribution</b>	
MLE Mean	2943.39
MLE Standard Deviation	620103.94
MLE Median	13.97
MLE Coefficient of Variation	210.68
MVUE Estimate of Mean	1107.80
MVUE Estimate of Std. Dev.	13425.80
MVUE Estimate of SE	914.80
MVUE Coefficient of Variation	12.12

<b>UCL Assuming Lognormal Distribution</b>	
95% H-UCL	59108.89
95% Chebyshev (MVUE) UCL	5095.32
99% Chebyshev (MVUE) UCL	10209.97

**FDEP Recommended UCL to Use:**  
**2659.18**

PROUCL NA

Note: These estimates are valid ONLY if samples are random and representative.

*TRPH (using highest laboratory values minus excavated area)*

**FDEP UCL Calculator Version 0.97**

**12/19/05**

*Note: Results reflect censored parameter estimations based on distributional assumptions.*

<b>Censor Estimated Statistics for TRPH</b>	
Number of Samples	34
Number of Censored Data	16
Minimum Non-censored	5.3
Maximum	8100
Mean	NA
Median	NA
Standard Deviation	NA
Variance	NA
Coefficient of Variation	NA
Skewness	NA

<b>95% UCL (Assuming Normal Data)</b>	
Student's-t	NA

<b>95% UCL (Adjusted for Skewness)</b>	
Adjusted-CLT	NA
Modified-t	NA

<b>95% Non-parametric UCL</b>	
CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	1561.82

<b>Censor Estimated Statistics for TRPH</b>		<b>ln()</b>
Minimum		0.742
Maximum		9.000
Mean		2.294
Standard Deviation		2.939
Variance		8.639
Fit		0.985

<b>Goodness-of-Fit Results</b>	
Distribution Recommended	Lognormal
Distribution Used	Lognormal

<b>Estimates Assuming Lognormal Distribution</b>	
MLE Mean	745.05
MLE Standard Deviation	55987.98
MLE Median	9.914
MLE Coefficient of Variation	75.147
MVUE Estimate of Mean	321.970
MVUE Estimate of Std. Dev.	2304.820
MVUE Estimate of SE	255.109
MVUE Coefficient of Variation	7.158

<b>UCL Assuming Lognormal Distribution</b>	
95% H-UCL	11074.587
95% Chebyshev (MVUE) UCL	1433.963
99% Chebyshev (MVUE) UCL	2860.274

**FDEP Recommended UCL to Use:**  
**1433.96**

PROUCL NA

Note: These estimates are valid ONLY if samples are random and representative.

**APPENDIX G**

**REMEDIAL TREATMENT OPTION COST ESTIMATE**

**Table G - 1**  
**Excavation and Off-site Disposal Cost**

Remedial Action Plan, Site 250  
Naval Station Mayport  
Mayport, Florida

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COST SUMMARY TABLE (costs rounded to nearest \$1000)

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DIRECT COSTS

Site Preparation and Mobilization	\$ 16,000
Planning Documents	\$ 22,000
Excavation Activities	\$ 18,000
Off-site Disposal of Soil	\$ 12,000
Site Restoration and Demobilization	\$ 5,000
Site Summary Reporting / Institutional Control (IC) Implementation	\$ 14,000
Groundwater Sampling/Monitoring	\$ 32,000
Costs for Excavation and Offsite Disposal	\$ 119,000
Contingency (@20%)	\$ 23,800

**TOTAL COSTS FOR EXCAVATION AND OFFSITE DISPOSAL**

**\$ 142,800**

**Table G - 1 (Continued)**  
**Excavation and Off-site Disposal Costs**

**DIRECT COSTS**

	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost</u>	<u>Total Cost</u>
<b>Site Preparation and Mobilization</b>				
Silt Fence	200	lf	\$ 6.14	\$ 1,228.00
Site Signs	4	ea	\$ 53.66	\$ 214.64
Decontamination Pad	1	ls	\$ 1,000.00	\$ 1,000.00
1800 PSI Steam Cleaner Rental (Assume base will provide decon water)	2.5	wk	\$ 1,100.00	\$ 2,750.00
Site Clearing	0.1	acre	\$ 164.65	\$ 16.47
Field Engineer (2.5 wk = 100 hr) (oversight of entire field event, prep, excavation, demob, etc. - 50 hr/wk)	100	hr	\$ 85.83	\$ 8,583.00
General site mobilization	1	ls	\$ 1,500.00	\$ 1,500.00
ODCs (e.g. copies, binders, shipping, telephones, etc.)	1	ls	\$ 1,000.00	\$ 1,000.00
<b>Total For Site Preparation and Mobilization</b>				<b>\$ 16,292.11</b>
<b>Planning Documents</b>				
<u>Planning Documents (HASP, WP)</u>				
Professional Engineer	40	hr	\$ 111.63	\$ 4,465.00
Staff Engineer	100	hr	\$ 85.83	\$ 8,582.50
Senior Technical Staff	40	hr	\$ 63.28	\$ 2,531.00
Technical Staff	40	hr	\$ 53.05	\$ 2,122.00
Administrative Assistant	40	hr	\$ 49.43	\$ 1,977.00
ODCs (e.g. copies, binders, shipping, etc.)	1	ls	\$ 200.00	\$ 200.00
Laborer	50	hr	\$ 40.00	\$ 2,000.00
<b>Total for Planning Documents</b>				<b>\$ 21,877.50</b>
<b>Excavation Activities</b>				
<u>Excavation of Soil (100 yd<sup>3</sup>)</u>				
Professional Engineer	4	hr	\$ 111.63	\$ 446.50
Staff Engineer (50 hrs/wk, 2 wks)	100	hr	\$ 85.83	\$ 8,582.50
Administrative Assistant	8	hr	\$ 49.43	\$ 395.40
OSHA 1910 Certified Equipment Operator	10	day	\$ 480.00	\$ 4,800.00
JD544 loader with 3 yard bucket	2	wk	\$ 1,925.00	\$ 3,850.00
20 CY Semi Dump	40	hr	\$ 93.87	\$ 3,754.80
Mobilization/Demobilization	1	ls	\$ 4,000.00	\$ 4,000.00
ODCs (e.g. fuel, freight, field supplies, etc.)	1	ls	\$ 2,000.00	\$ 2,000.00
<b><u>Subtotal for Excavation Activities</u></b>				<b>\$ 18,074.40</b>
<b>Off-site Disposal of Soil</b>				
Transportation (per 20 CY Semi Dump)	500	mi	\$ 1.65	\$ 825.00
Disposal Fees	1	ea	\$ 2,000.00	\$ 2,000.00
Disposal	100	yd <sup>3</sup>	\$ 93.50	\$ 9,350.00
<b><u>Subtotal for Off-site Disposal of Soil</u></b>				<b>\$ 12,175.00</b>

**Site Restoration and Demobilization**

Clean Common fill for backfill (load and haul)	100 yd <sup>3</sup>	\$ 32.97	\$ 3,297.00
Spreading and compaction	100 yd <sup>3</sup>	\$ 0.52	\$ 52.00
Demobilization of Equipment	1 ls	\$ 1,000.00	\$ 1,000.00
Reseeding	1 ls	\$ 500.00	\$ 500.00

**Subtotal for Site Restoration and Demobilization:** **\$ 4,849.00**

Assumption:

No repair work to Site 250 beyond clean backfill w/compaction and reseeding was priced.

**Site Summary Reporting / Institutional Control (IC) Implementation**Site Summary Reporting / IC Implementation

Professional Engineer	20 hr	\$ 111.63	\$ 2,232.50
Staff Engineer	80 hr	\$ 85.83	\$ 6,866.00
Senior Technical Staff	50 hr	\$ 63.28	\$ 3,163.75
Technical Staff	16 hr	\$ 53.05	\$ 848.80
Administrative Assistant	16 hr	\$ 49.43	\$ 790.80
ODCs (e.g. copies, binders, shipping, telephones, etc.)	1 ls	\$ 500.00	\$ 500.00

**Total for Summary Data Report** **\$ 14,401.85**

**Groundwater Sampling/Monitoring**Field Sampling & Oversight (Quarterly)

Round of Groundwater sampling	4 ea	\$ 8,000.00	\$ 32,000.00
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**Total for Field Sampling and Oversight** **\$ 32,000.00**