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UNDERGROUND STORAGE TANK REMEDIAL INVESTIGATION REPORT NCBC DAVISVILLE RI
12/01/1994
HALLIBURTON NUS

UST Remedial Investigation Report

Naval Construction Battalion Center
Davisville, Rhode Island

Northern Division
Naval Facilities Engineering Command
Contract Number N62472-90-D-1298
Contract Task Order 0178

December 1994

Halliburton NUS
CORPORATION

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UST REMEDIAL INVESTIGATION REPORT

NAVAL CONSTRUCTION BATTALION CENTER
DAVISVILLE, RHODE ISLAND

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Northern Division
Environmental Branch, Code 18
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Lester, Pennsylvania 19113-2090

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CONTRACT NUMBER N62472-90-D-1298
"CLEAN" Contract Task Order No. 0178

December 1994

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STATEMENT OF ACCURACY

As required by the Rhode Island Department of Environmental Management Regulations for Underground Storage Facilities used for Petroleum Products and Hazardous Materials (DEM DWM-UST05-93) Section 14.12 (B) (1), effective December 30, 1993, the undersigned (author) certifies that information presented in this UST Remedial Investigation Report and Preliminary Corrective Action Plan for the Naval Construction Battalion Center in Davisville Rhode Island, is accurate to the degree specified in this report and the Final Work Plan for UST Remedial Investigation (HNUS 4/94).

Stephen S. Parker
Project Manager
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As required by the Rhode Island Department of Environmental Management Regulations for Underground Storage Facilities used for Petroleum Products and Hazardous Materials (DEM DWM-UST05-93) Section 14.12 (B) (2), effective December 30, 1993, the undersigned (facility owner/operator representative) certifies that information presented in this UST Remedial Investigation Report and Preliminary Corrective Action Plan for the Naval Construction Battalion Center in Davisville Rhode Island, is complete and accurate to the degree specified in this report and the Final Work Plan for UST Remedial Investigation (HNUS 4/94).

Brian J. Helland
Remedial Project Manager
Naval Facilities Engineering Command

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1.0 INTRODUCTION

This Underground Storage Tank (UST) Remedial Investigation Summary Report has been prepared under the Comprehensive Long-Term Environmental Action Navy (CLEAN) contract by Halliburton NUS Corporation (HNUS). This report describes investigation activities conducted at the Former Naval Construction Battalion Center (NCBC) in Davisville, Rhode Island, in July and August 1994. This report also presents a Preliminary Corrective Action Plan as required by the State of Rhode Island Department of Environmental Management (RIDEM) UST Section.

1.1 OVERVIEW

In June 1993, HNUS published an UST Investigation Summary Report for the Navy that described prior investigation and removal activities for 72 USTs within the NCBC. These investigation and removal activities were undertaken by O'Brien & Gere Engineers Inc. and Franklin Environmental Services Inc. between 1989 and 1992. The HNUS summary report recommended additional investigations at 24 locations where 40 of these former USTs were removed.

In April 1994, HNUS published a Work Plan for a UST Remedial Investigation at these former UST locations. The work plan was reviewed by the RIDEM UST Section and was implemented in June 1994. During the execution of this investigation, the following tasks were performed:

- Installation of 57 shallow soil borings.
- Completion of 24 borings as shallow groundwater monitoring wells.
- Excavation of four former UST locations as test pits.
- Collection of soil samples for field screening and laboratory analysis.
- Collection of groundwater samples for laboratory analysis.

This report has been prepared to summarize these investigations and the data that were produced.

This report also presents recommendations for former UST locations where petroleum-based contaminants were found in soil and/or groundwater at concentrations greater than those considered acceptable for this area by RIDEM. These recommendations include:

- additional investigations at three former former UST locations,
- preliminary Corrective Action Plans for seven former UST locations,
- remedial action in conjunction with Superfund site remediation at 12 former UST locations, and
- no further action at four former UST locations.

1.2 REPORT FORMAT

This UST Remedial Investigation Report has been organized to comply with the RIDEM UST Section Regulations For Underground Storage Facilities Used For Petroleum Products and Hazardous Materials, section 14.09.

Section 1.0 presents an overview of the project evolution and execution. Section 2.0 summarizes the historical information recorded for the UST Sites, originally published in the UST Investigation Summary Report for The Naval Construction Battalion Center (HNUS June 1993). Section 3.0 presents a description of the recent field investigation, as directed by the HNUS UST RI Work Plan (HNUS June 1994). Section 4.0 presents a summary of the findings of this investigation, and also describes findings of other investigations performed at the NCBC that are relevant to the UST locations described in this report. Section 5.0 presents a description of the areas around the UST sites, which includes locations of private wells and other potential receptors of concern, groundwater classifications, and other known release sites. Section 6.0 presents the findings of this investigation and recommendations on the need for corrective action or further investigations at each former UST location.

Section 7.0 of this report presents preliminary corrective action plans for former UST locations that were determined to require remedial actions under RIDEM UST regulations. These preliminary Corrective Action Plans are formatted to conform to the requirements of the RIDEM UST regulations, Section 14.12.

2.0 BACKGROUND

The following information has been provided by the NCBC in Davisville, Rhode Island and by the Northern Division of the Naval Facilities Engineering Command for the UST Investigation Summary Report (HNUS, June 1993). It has been updated for this UST Investigation Report.

2.1 SITE DESCRIPTION

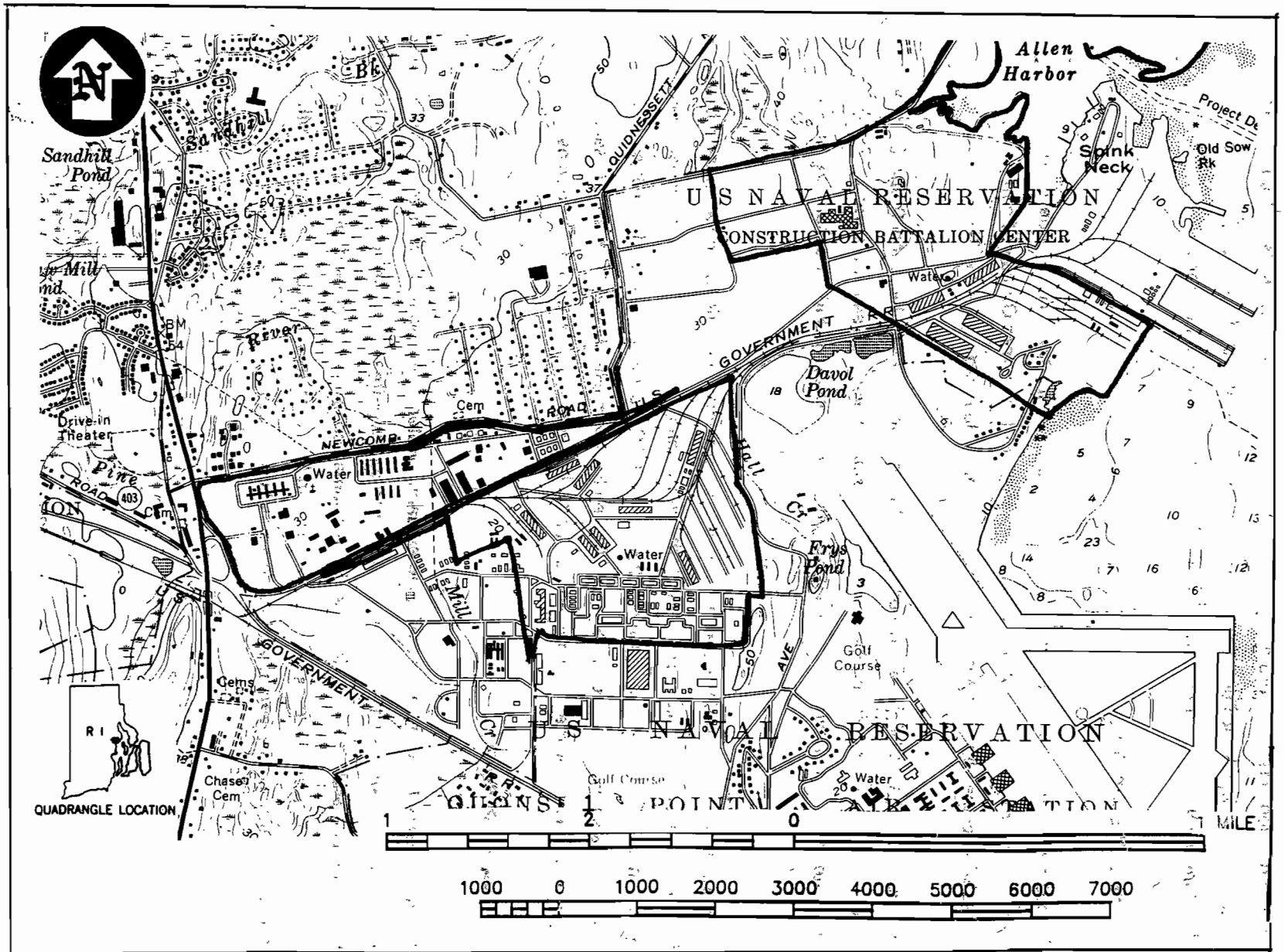
The NCBC is located on the southwest shore of Narragansett Bay in Davisville, Rhode Island. The NCBC is a part of the larger U.S. Naval Reservation adjacent to the former Quonset Point Naval Air Station. The NCBC occupies approximately 1300 acres, and is depicted on Figure 2-1.

The terrain occupied by the NCBC is gently rolling, and ranges in elevation between 0 and 50 feet above sea level. Most of the area is vegetated only with ground cover (grasses and shrubs). Several sections of the site, however, have more extensive vegetative growth, including secondary growth forest.

The NCBC was primarily used for training naval seamen in construction operations, and as storage and freight yards for construction materials. As a result, the site is comprised primarily of warehouse space and freight yards, most of which are presently empty. The NCBC was closed on April 1, 1994. Most of the staff and materials have been moved off site. Currently, only facilities management and security staff remain on site, to care for the buildings and grounds during the interim period before closure.

2.2 WATER RESOURCES

The RIDEM Water Quality Regulations classify the estuarine water to the east of the site as SB/SC. Class SB waters are sea waters that are acceptable for fish and wildlife habitat, for bathing and other primary physical contact, and for harvesting shellfish for human consumption (after depuration). Class SC waters are sea waters that are acceptable for fish and wildlife habitat, for boating and other secondary (recreational) human contact, and for industrial processes.



LOCATION MAP			FIGURE 2–1
UST REMEDIAL INVESTIGATION			Halliburton NUS CORPORATION
US NAVY – NCBC DAVISVILLE, RI			
DRAWN BY:	R. SARGENT	REV.: 0	
CHECKED BY:	W. MARTIN	DATE: 01 September 1994	187 Ballardvale St. Wilmington, MA 01887 (508)658-7899
SCALE:	AS SHOWN	PROJECT NO.: 1905 CTO 178	

Groundwater at the main base is classified as GB. West Davisville and Camp Fogarty (west of the Main Base) are classified as GAA. Class GB groundwater is considered to be unsuitable for public water supply without appropriate treatment, and class GAA groundwater is considered acceptable for general water supply. All UST locations described in this report are located on the Main Base.

No active groundwater supply wells exist at the main base (TRC, 1993). All potable water supplies within the NCBC area are supplied by groundwater sources. A group of five public groundwater supply wells is located near the intersection of U.S. Route 1 (Boston Post Road) and Route 402. These wells are located approximately 0.25 miles north-northwest of the site in the Hunt River Reservoir. Two of the wells are owned and managed by the Town of North Kingston, two of the wells are owned and managed by the Rhode Island Port Authority, and one well is owned and operated by the Kent County Water Authority (HNUS, April 1994).

Other public drinking water supply wells are located approximately 2 miles north of the NCBC area and are operated by the Rhode Island Port Authority and Economic Corporation (RIPAEC) and by the Water Works Commission of North Kingstown (HNUS, April 1994).

2.3 PREVIOUS INVESTIGATION AND REMEDIATION

Seventy-three storage tanks (72 underground tanks and one above ground tank) at the NCBC were identified in a report submitted to the U.S. Navy by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) in August 1989. The report described site inspections and records searches that resulted in a list of USTs on the NCBC property and specifications for these USTs. These USTs were grouped into 14 UST areas based on their physical location on the NCBC property. Some of this information has been condensed and is presented on Table 2-1 of this report. The UST areas are depicted on Figure 2-2.

The O'Brien & Gere report made recommendations for removal and replacement of many of these tanks, and therefore focused on complying with the RIDEM regulations for replacing tanks. The report presented some information regarding the physical characteristics of the tanks, however, these characteristics (such as size, construction and location) were based on historical records only, and were not verified in the field.

TABLE 2-1
TANK SPECIFICATIONS AND STATUS
NAVAL CONSTRUCTION BATTALION CENTER
DAVISVILLE, RI

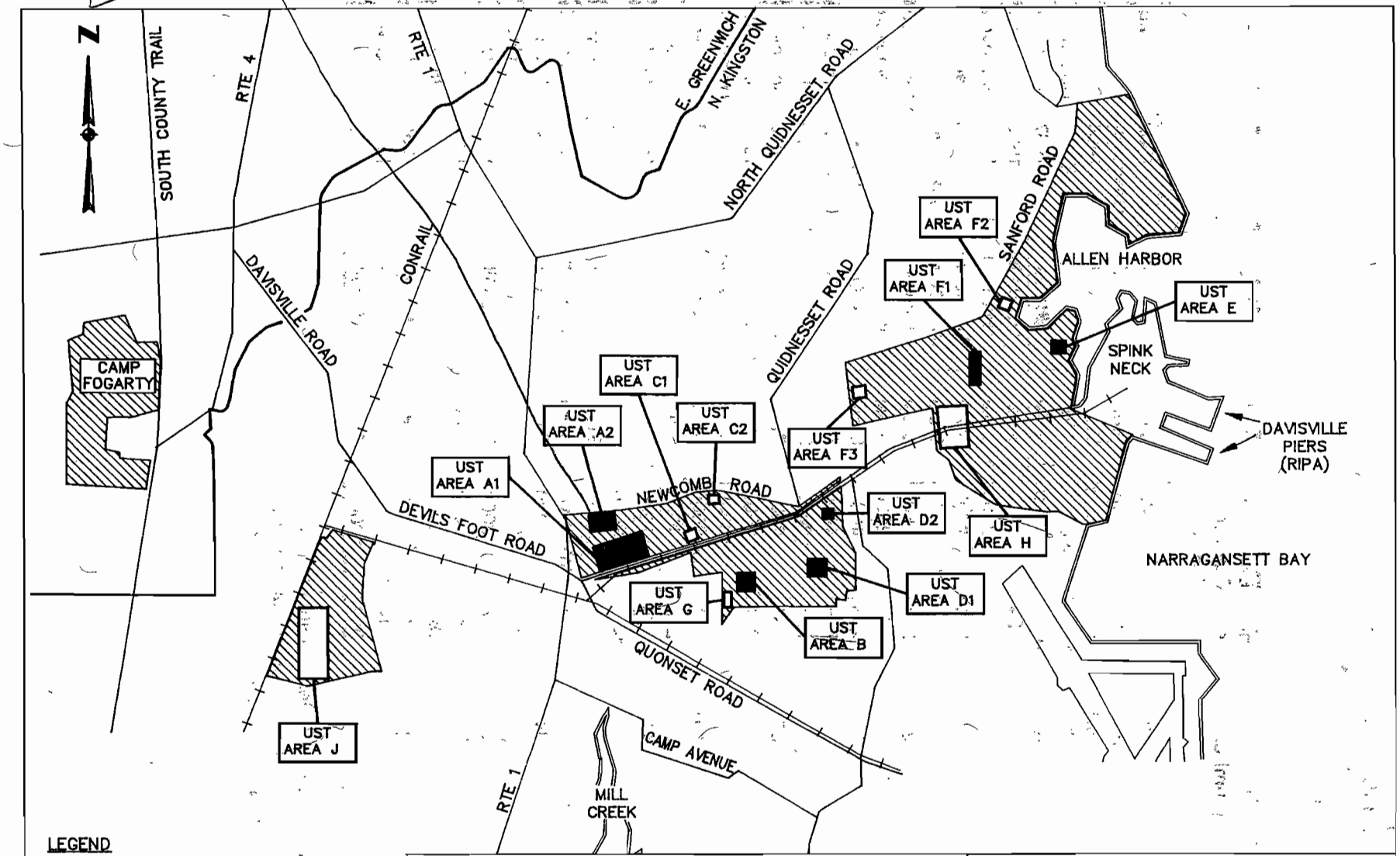
UST Area	UST Number	Building Number	Expected Capacity* (gallons)	Construct.*	Product*	Year Installed*	Status**
A1	2	43	Unknown	Unknown	Rust Remover	1943	Not Found
	3	43	2000	Steel	#2 Oil	1943	Removed
	4	44	550	Steel	#2 Oil	1943	Removed
	5	45	550	Steel	#2 Oil	1943	Removed
	6	46	550	Steel	#2 Oil	1942	Removed
	7	47	550	Steel	#2 Oil	1943	Removed
	8	48	2000	Steel	#2 Oil	1945	Removed
	9	48	250	Steel	Waste Oil	1945	Removed
	11	115	5000	Steel	Gasoline	1942	Removed
	12	115	5000	Steel	Gasoline	1942	Removed
	13	115	5000	Steel	Gasoline	1942	Removed
	14	115	3000	Steel	Gasoline	1942	Removed
	15	115	2000	Steel	Diesel	1942	Removed
	16	115	2000	Steel	Gasoline	1942	Removed
	17	115	2000	Steel	Gasoline	1942	Removed
	18	115	1000	Steel	Gasoline	1942	Removed
	19	115	1000	Steel	Diesel	1942	Removed
	20	115	1000	Steel	Diesel	1942	Removed
	21	115	1000	Steel	Kerosene	1942	Removed
	22	115	1000	Steel	Kerosene	1942	Removed
	51	D-313	1000	Steel	#2 Oil	1954	Removed
A2	49	C-143	6000	Steel	Gasoline	1953	Removed
	50	C-143	6000	Steel	Gasoline	1953	Removed
	67	101	280	Unknown	Gasoline	Unknown	Removed
	69	102	Unknown	Steel	#2 Oil	Unknown	Removed
	70	103	Unknown	Steel	#2 Oil	Unknown	Removed
B	56	S-6	1500	Steel	#2 Oil	1942	Removed
	57	S-8	550	Steel	#2 Oil	1942	Removed
	58	S-16	1000	Steel	#2 Oil	1942	Removed
	60	S-18A	550	Steel	#2 Oil	1952	Removed
C1	42	C-113	15000	Steel	#4 Oil	1964	Removed
	43	C-113	15000	Steel	#4 Oil	1964	Removed
	44	C-113	15000	Steel	#4 Oil	1964	Removed
C2	45	C-125	2000	Steel	#2 Oil	1954	Removed
D1	46	C-130	1000	Steel	#2 Oil	1953	Removed
	47	C-131	1000	Steel	#2 Oil	1953	Removed
	48	C-132	1000	Steel	#2 Oil	1953	Removed
	65	W-5A	Unknown	Steel	#2 Oil	1945	Removed
	63	W-3A	Unknown	Steel	#2 Oil	1943	Removed
	71	W-3A	ND	ND	ND	ND	Removed
	64	W-4	1000	Steel	Used Oil	1952	Removed
	62	T-1A	Unknown	Steel	#2 Oil	1943	Removed

* Data from O'Brien & Gere Engineers, Inc., 1989
** Data from Franklin Environmental Services, 1992
ND – No data are available

TABLE 2-1
TANK SPECIFICATIONS AND STATUS
NAVAL CONSTRUCTION BATTALION CENTER
DAVISVILLE, RI
Page 2 of 2

UST Area	UST Number	Building Number	Expected Capacity* (gallons)	Construct.*	Product*	Year Installed*	Status**
D2	10	68	5000	Steel	#2 Oil	1960	Removed
	10A	68	Unknown	Steel	#2 Oil	Unknown	Not Found
E	52	E-111	1520	Steel	#2 Oil	1954	Removed
	72	E-111	ND	ND	ND	ND	Removed
	68	E-107	1520	Steel	#2 Oil	1967	Removed
F1	24	224	2000	Steel	Used Oil	1953	Removed
	25	224	2000	Steel	Used Oil	1953	Removed
	26	224	2000	Steel	Unknown	1953	Removed
	27	224	500	Steel	Gas/Diesel	Unknown	Removed
	28	224	500	Steel	Unknown	1953	Removed
	66	224	2000	Steel	Waste Oil	Unknown	Removed
	29	225	4000	Steel	#4 Oil	Unknown	In Use
	30	225	4000	Steel	#4 Oil	Unknown	In Use
	31	225	10000	Steel	#4 Oil	1975	In Use
	37	331	2000	Steel	Gasoline	1955	Removed
	38	331	2000	Steel	Gasoline	1955	Removed
	39	331	10000	Steel	Gasoline	1974	Removed
	40	331	10000	Steel	Gasoline	1974	Removed
F2	23	218	1520	Steel	#2 Oil	Unknown	Removed
F3	41	378	1520	Steel	#2 Oil	1968	In Use
G	61	S-32	2000	Steel	#2 Oil	1943	In Use
	59	S-17	550	Steel	#2 Oil	1942	In Use
H	1	41	Unknown	Steel	Preservative	1942	Removed
	34	318	3000	Steel	#2 Oil	1952	In Use
	35	318	3000	Steel	#2 Oil	1952	In Use
	36	318	3000	Steel	#2 Oil	1952	In Use
	53	E-319	3000	Steel	#2 Oil	1956	In Use
	54	E-319	3000	Steel	#2 Oil	1956	In Use
	55	E-319	3000	Steel	#2 Oil	1956	In Use
J	32	314	5000	Steel	#2 Oil	1979	In Use
	33	317	10000	Steel	#2 Oil	1973	In Use

* Data from O'Brien & Gere Engineers, Inc., 1989
** Data from Franklin Environmental Services, 1992
ND -- No data are available



LEGEND

- NAVY PROPERTY
- TOWN BOUNDARIES
- UST AREAS UNDER INVESTIGATION

UNDERGROUND STORAGE TANK (UST) AREAS			
NCBC DAVISVILLE, R.I.			
DRAWN BY:	R. SARGENT	REV.:	0
CHECKED BY:	S. PARKER	DATE:	19 SEPT 94
SCALE:	APPROXIMATE	PROJECT NO.:	1905 CTO #178

FIGURE 2-2

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In May and June 1992, Franklin Environmental Services, Inc. was contracted to remove 59 of the 73 tanks identified by O'Brien & Gere. Table 2-1 indicates those USTs that were closed and removed from areas A1, A2, B, C1, C2, D1, D2, E, F1, F2, and H. Two tanks were not found, including one at area A1, and one at area D2. Fourteen (14) tanks remain in operation, including three at area F1, six at area H, one at area F3, two at area G, and two at area J. All tanks that are currently in use at the site are scheduled for removal by Spring, 1995.

Upon completion of the UST closure work, Franklin Environmental Services prepared a Tank Closure Summary. The closure summary briefly described removal operations and presented analytical results for samples that were collected during the removal process. Also included in the closure summary were transportation and disposal manifests for wastes generated at the site, field notes generated for each excavation, and sample shipment paperwork. This closure summary was submitted to the Northern Division of the Naval Facilities Engineering Command (NORTHDIV) which, in turn, submitted it to the RIDEM UST Section.

During the UST removal work in 1992, TRC Environmental Corporation (TRC) provided limited support to the excavation contractor. This assistance was provided because of the proximity of 13 of the USTs to Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigation sites. TRC observed some of the UST removal operations in UST areas F1, D1, and D2.

Two CERCLA sites are located near UST Areas D1 and D2. Both of these sites are solvent disposal sites. The proximity of these sites to UST Areas D1 and D2, and expected groundwater flow directions indicate that the reported solvent releases could affect these UST areas.

Two CERCLA sites are located near UST Area F1. One, the "CED Battery Acid Disposal Area" encompasses the entire area surrounding and including all the former UST locations in this area. A second CERCLA site, the "CED Solvent Disposal Area", is located immediately west of this area. Proximity of the sites, and groundwater flow directions described by TRC in this area indicates that the solvent disposal area releases could affect the UST locations in Area F1.

In November 1992, TRC provided the Naval Facilities Engineering Command (NAVFAC) with an Underground Storage Tank Closure Report that summarized their observations during the 1992 UST removal work. Some of the information in the TRC report was found to conflict with the information presented by O'Brien & Gere and Franklin Environmental Services.

The RIDEM did not accept TRC's UST Summary report as an adequate tank closure summary report under the RIDEM UST Closure Regulations. The RIDEM requested the Navy to produce a complete UST

Summary report, which was prepared and published by Halliburton NUS in June 1993. The HNUS report reviewed all the data collected to date, summarized conflicting records, and recommended additional investigations at the former UST locations in seven of the UST areas identified. Those areas included A1, A2, B, D1, D2, E, and F1 (Figure 2-2). This report describes the findings of these investigations.

The RIDEM also required the initiation of subsurface investigations at these locations to identify contaminant presence, and to determine the need for corrective action at each location. Therefore, the Navy tasked HNUS to implement the investigations that were recommended in the June 1993 Investigation Summary Report, and provide a corrective action plan for those sites where adequate data was available. This report has been prepared to fulfill those requirements.

3.0 FIELD INVESTIGATION

This section describes field investigation techniques, quality control, and data validation procedures that were utilized to identify contaminants suspected to be present in soil and groundwater at seven UST Areas (A1, A2, B, D1, D2, E, and F1) at the former NCBC in Davisville, Rhode Island. Former UST locations selected for investigation are described in Section 2.0 of this report.

Soil and groundwater samples were collected for screening and laboratory analysis from the former UST locations to accomplish the objectives described in Section 1.0. The specific activities conducted during the investigation are presented in the following subsections. Table 3-1 summarizes the investigation methods that were used at each former UST location.

3.1 SAMPLING ACTIVITIES - TECHNICAL APPROACH

This subsection describes the technical approach and sampling procedures that were utilized for the investigation at the NCBC.

3.1.1 Test Pit Excavation

Test pits were excavated at selected former UST locations that were likely to contain limited quantities of contaminated soil and that were unlikely to have impacted groundwater or migrated beyond the immediate vicinity of the former location. This method provides a quick characterization of subsurface materials and the opportunity to remove heavily contaminated soil in a timely fashion. Therefore, this method was selected for four former UST locations that were found to have residual soil total petroleum hydrocarbons (TPH) concentrations between 300 and 500 mg/kg, and were situated in areas where groundwater is evidenced to be well below the bottom of the former UST (typically more than 10 feet below ground surface). These locations were all within UST Areas A1 and A2.

Test pits were performed at UST locations 8, 9, 69, and 70. Prior to initiation of each excavation, subsurface utilities maps were obtained from NCBC facilities management. The underground features on these drawings in the area of the excavation were reviewed by the HNUS field supervisor and the excavation foreman. Safety margins for underground utilities were determined by measuring from above ground features and marking pavement.

TABLE 3-1
INVESTIGATIONS PERFORMED AT
FORMER UST LOCATIONS

UST AREA	UST LOCATION NO.	INVESTIGATION METHODS
A1	11-22	Installation of five borings, three finished as monitoring wells, to profile soil and groundwater chemistry at former locations of 11 USTs.
	3	Installation of three borings, one finished as a groundwater monitoring well, to profile total petroleum hydrocarbons (TPH) contamination in soil, and determine possible subsequent contamination of groundwater.
	5	Installation of two borings to profile TPH contamination in soil.
	6	Installation of three borings, one finished as a groundwater monitoring well, to profile TPH contamination in soil, and determination of possible subsequent contamination of groundwater.
	7	Installation of two borings to confirm low concentrations of TPH in remaining soil.
	8	Excavation of test pit to profile TPH contamination of soil and removal of limited quantities of contaminated soil.
	9	Excavation of test pit to profile TPH contamination of soil and removal of limited quantities of contaminated soil.
A2	69	Excavation of test pit to profile TPH contamination of soil and removal of limited quantities of contaminated soil.
	70	Excavation of test pit to profile TPH contamination of soil and removal of limited quantities of contaminated soil.
B	56	Installation of three borings, one finished as a groundwater monitoring well, to profile TPH contamination in soil, and determination of possible subsequent contamination of groundwater.
	58	Installation of three borings, one finished as a groundwater monitoring well, to profile TPH contamination in soil, and determination of possible subsequent contamination of groundwater.
D1	46	Installation of two borings finished as groundwater monitoring wells to profile TPH contamination in soil and identification of reported groundwater contamination.
	47	Installation of three borings, one finished as a groundwater monitoring well, to profile TPH contamination in soil, and determination of possible subsequent contamination of groundwater.
	48	Installation of two borings finished as groundwater monitoring wells to profile TPH contamination in soil and identification of reported groundwater contamination.

TABLE 3-1
INVESTIGATIONS PERFORMED AT
FORMER UST LOCATIONS
PAGE 2 OF 2

UST AREA	UST LOCATION NO.	INVESTIGATION METHODS
	62	Installation of three borings, one finished as a groundwater monitoring well, to profile TPH contamination in soil, and determination of possible subsequent contamination of groundwater.
	63 & 71	Installation of two borings finished as groundwater monitoring wells to identify reported groundwater contamination and potential subsequent contamination of soil.
	64	Installation of two borings to profile soil chemistry and contaminant presence in soil.
	65	Installation of three borings, one finished as a groundwater monitoring well, to profile TPH contamination in soil, and determination of possible subsequent contamination of groundwater.
D2	10	Installation of two borings finished as groundwater monitoring wells to identify reported groundwater contamination and possible subsequent contamination of soil.
E	68	Installation of three borings, one finished as a groundwater monitoring well, to profile TPH contamination of soil and identification of potential subsequent contamination of groundwater.
F1	25	Installation of four borings, one finished as groundwater monitoring wells, to profile soil contamination and identification of subsequent groundwater contamination.
	26-28	Installation of five borings, three finished as groundwater monitoring wells, to profile soil contamination and identification of subsequent groundwater contamination.
	66	Installation of two borings, one finished as groundwater monitoring wells, to profile soil contamination and identification of subsequent groundwater contamination.
	37-40	Installation of two borings to confirm extent of contamination reached during removal of soil.
TOTALS		56 Borings, 24 finished as wells, and four test pits

Each initial test pit was excavated four to six feet wide such that it intersected a cross-section of the former UST location. The test pits were excavated in two or three foot depth intervals to a minimum depth of 12 feet below ground surface, expected to be a level of at least two feet below the former UST bedding material.

Soil samples were collected by the HNUS field supervisor for headspace analysis from each wall and bottom of the pit after each depth interval was excavated. The excavated material was monitored with an Organic Vapor Analyzer (OVA 128) Flame Ionization Detector (FID) using the headspace screening method described in the Work Plan. If significantly contaminated soil (those that exceeded 20 ppm total VOC by headspace analysis) were encountered, they were stockpiled separately from other subsurface materials.

Once the test pit was considered complete, a pit was dug at the center of the excavation to attempt to contact the top of groundwater. Groundwater was not contacted in any of the test pits excavated.

A log of each excavation was recorded and is presented in Appendix A. Test pit logs describe the locations of each excavation, and sample locations for screening analysis. Table 3-2 describes soil samples collected from test pits for laboratory analysis.

Stockpiled contaminated soil were moved into a roll-off container and covered. Representative composite samples were collected for analysis for appropriate disposal parameters.

The excavation was lined with 6 mil polyethylene sheeting and backfilled with clean fill to eliminate physical fall hazards. The backfill was finished with bank run gravel.

3.1.2 Soil Borings

Soil borings were performed at selected former UST locations that were expected to have unknown quantities of contaminated soil. This included former UST locations where contaminant concentrations were expected to be high enough to have resulted in contaminant migration. Therefore, borings were performed at locations where TPH were previously detected at concentrations greater than 500 mg/kg and at locations where groundwater was expected to be within close proximity or above the bottom of the previous excavation (typically less than 10 feet below ground surface).

TABLE 3-2
SOIL SAMPLES COLLECTED FROM TEST PITS
FORMER NCBC UST INVESTIGATION
DAVISVILLE RHODE ISLAND

UST AREA	Test Pit No.	Sample No. (1)	Sample Location	Parameters	Screening Result (1)
A1	TP-8	8-TP-0806SE	Excavation B, SE side (8.6 feet)	TPH	ND
		8-TP-1205B	Excavation A, bottom (12.5 feet)	TPH	ND
		8-TP-1200B	Excavation B, bottom (12 feet)	TPH	ND
		8-TP-0808NW	Excavation A, NW Side (8.8 feet)	TPH	ND
	TP-9	9-TP-0806S	South side (8.6 feet)	VOCs, TPH	ND
		9-TP-0802NE	Northeast side (8.2 feet)	VOCs, TPH	ND
A2	TP-69	69-TP-0607W	Stage 2 excavation, W side (6-7 feet)	TPH	ND
		69-TP-0708S	Stage 2 excavation, S side (7-8 feet)	TPH	ND
		69-TP-1011B	Stage 2 excavation, bottom (10-11 feet)	TPH	2 ppm
		69-TP-1012SE	Stage 3 excavation, SE corner (10-12 feet	TPH	>100 ppm
		69-TP-1112E	Stage 3 excavation, E side (11-12 feet)	TPH	>100 ppm
	TP-70	70-TP-0910S	Excavation A, S side (9-10 feet)	TPH	ND
		70-TP-1011SE	Excavation A, SE Corner (10-11 feet)	TPH	ND
		70-TP-0809NW	Excavation B, NW Corner (8-9 feet)	TPH	ND
		70-TP-1112NW	Excavation B, NW Corner (11-12 feet)	TPH	ND
		70-TP-1112NE	Excavation B, NE Corner (11-12 feet)	TPH	ND

(1) Headspace screening results from all samples are presented in Appendix D

Borings were installed using 4-inch inside diameter hollow stem augers advanced to specific sampling depths. Soil samples were collected using a split spoon sampling device, driven 0-18 inches ahead of the auger cutting head.

Prior to initiation of work at each former UST location, subsurface utilities maps were obtained from NCBC facilities management. After review of maps and an evaluation of the area, borings were installed in locations that best met the objectives of the investigation while remaining a safe distance from live overhead and underground utilities. In some locations, the borings could not be installed in the area expected to be the most contaminated; these borings were moved to the nearest safe location suitable for the data needs.

In general, the borings were initially advanced two feet below ground surface. Continuous samples were then collected in two foot intervals to a depth of approximately 12 to 20 feet below ground surface. The end of boring was determined by the field geologist based on the field screening results and depth to water.

All borings were advanced to extend below the expected depth of the bottom of the former UST, (minimum of 12 feet below ground surface). Where possible, the borings were continued past this depth until VOC concentrations measured by headspace screening decreased to less than 20 ppm. This approach was followed in all but two areas: UST locations that were adjacent to the solvent disposal areas were not continued below 20 feet due to the concern of generating Investigation-Derived Waste (IDW). In addition, borings at UST location 11-22 were not continued below 20 feet below ground surface, as it was immediately determined that the groundwater in this area was contaminated, and it was recognized that additional investigations would be necessary at this location.

Samples were acquired with nominal 2-inch outside diameter split-spoon samplers, consistent with the methods presented in ASTM D-1586-84. Soil samples were collected from split spoons by the field geologist. Procedures for sample handling and breakdown are described in Section 3.3.3 of the work plan.

The field geologist maintained a log of each borehole to describe lithologies encountered, depth of geologic contacts, water levels, sample depths, and any other pertinent observations made during drilling. Soil samples were described using the Unified Soil Classification System (U.S.C.S.). Boring logs also include information on sample number, type, and depth; sample interval and recovery; and data from Standard Penetration Tests. Boring logs are presented as Appendix B of this report. The borehole itself was periodically monitored for organic vapors, in accordance with the Health and Safety Plan.

Table 3-3 presents a summary of the borings that were installed during this program. This table presents total depth of the borings, partial results from borehole organic vapor monitoring, and depth intervals of soil samples collected for laboratory analysis during the drilling program.

An aliquot from each split-barrel soil sample collected was analyzed for total volatile organics through field headspace screening. A second aliquot was collected for laboratory analysis of TPH and at some locations, a third aliquot was collected for laboratory analysis of volatile organic compounds (VOCs). Soil samples for VOCs were only collected from locations where former USTs were used for gasoline and waste oil storage.

Following the completion of the headspace screening of samples from each borehole, approximately two samples from each boring were selected for laboratory analysis. These samples included one aliquot for TPH, and at some locations, a second aliquot for VOCs.

In general, two laboratory samples were selected from each boring. The first laboratory sample from each boring was taken from the zone that exhibited the highest reading by the headspace analysis. The second laboratory sample from each boring was taken from the first interval that provided a headspace screening result of less than 20 ppm. In cases where there was not enough sample volume for these analyses, material was prioritized based on location, and samples from other intervals were used for analysis.

3.1.3 Groundwater Monitoring

To characterize groundwater quality at selected former UST locations, some borings were finished as groundwater monitoring wells. Groundwater monitoring wells were installed and sampled to identify direct contamination from USTs or from contaminant leaching and migration. RIDEM UST closure regulations require groundwater testing in areas that may have impacted groundwater.

A minimum of one groundwater monitoring well was installed at each former UST location where TPH was found at concentrations greater than 500 mg/kg and at locations where groundwater was expected to be near or above the bottom of the former UST (typically less than 10 feet below ground surface). This approach was followed wherever possible. One former UST location (64) was originally scoped for a monitoring well. Unfortunately, live overhead utility lines did not allow a drilling rig in the target area.

TABLE 3-3
SOIL SAMPLES COLLECTED FROM BORINGS
FORMER NCBC UST INVESTIGATION
DAVISVILLE RHODE ISLAND

UST AREA	Well/Boring No.	Max FID Reading (1)	Interval of Max FID Reading	Parameters	Laboratory Samples Interval 1	Interval 2	Interval 3
A1	3-B1	0	–	TPH	8-10	10-12	
	3-B2	4	4-6	TPH	4-6	10-12	
	3-MW1	0.2	4-6	TPH	4-6	18-20	
	5-B1	50	4-6	TPH	4-6	8-10	
	5-B2	4	4-6	TPH	4-6	6-8	
	6-B1	0	–	TPH	2-4	10-12	
	6-B2	0	–	TPH	2-4	10-12	
	6-MW1	0.5	16-18	TPH	2-4	8-10	
	7-B1	0		TPH	6-8	14-16	
	7-B2	20	6-8	TPH	8-10	10-12	
	11-B1	100	2-4	VOCs, TPH	12-14	NS	
	11-B2	850	10-12	VOCs, TPH	10-12	18-20	
	11-MW1	>1000	12-14	VOCs, TPH	10-12	12-14	18-20
	11-MW2	0	–	VOCs, TPH	4-6	NS	
	11-MW3	>1000	12-14	VOCs, TPH	12-14	18-20	
B	56-B1	>1000	8-10	TPH	8-10	18-20	
	56-B2	35	6-8	TPH	6-8	12-14	
	56-MW1	>1000	8-10	TPH	8-10	NS	
	58-B1	58	4-6	TPH	4-6	12-14	
	58-B2	12	4-6	TPH	2-4	10-12	
	58-MW1	1	2-4	TPH	2-4	18-20	
D1	46-MW1	100	4-6	TPH	4-6	12-14	
	46-MW2	800	4-6	TPH	4-6	16-18	
	47-B1	600	4-6	TPH	4-6	6-8	18-20
	47-B2	200	6-8	TPH	6-8	12-14	
	47-MW1	>1000	2-4	TPH	8-10	18-20	
	48-MW1	>1000	4-6	TPH	4-6	18-20	
	48-MW2	700	6-8	TPH	4-6	18-20	
	62-B1	3	6-8	TPH	6-8	12-14	
	62-B2	680	6-8	TPH	6-8	18-20	
	62-MW1	200	2-4	TPH	2-4	18-20	
	63-MW1	100	6-8	VOCs, TPH	6-8	8-10	
	71-MW1	100	8-10	VOCs, TPH	8-10	14-16	
	64-B1	60	2-4	TPH	2-4	10-12	
	64-B2	20	2-4	TPH	2-4	10-12	
	65-B1	1	2-4	TPH	2-4	10-12	
	65-B2	2	8-10	TPH	8-10	10-12	4-6
	65-MW1	0	–	TPH	10-12	12-14	
D2	10-MW1	250	4-6	TPH	4-6	6-8	10-12
	10-MW2	10	6-8	TPH	6-8		
E	68-B1	200	4-6	TPH	4-6	10-12	
	68-B2	700	2-4	TPH	2-4	8-10	
	68-MW1	>1000	2-4	TPH	2-4	8-10	
F1	25-B1	0.5	10-12	VOCs, TPH	6-8	10-12	
	25-B2	2.2	6-8	VOCs, TPH	4-6	10-12	
	25-B3	3.5	2-4	VOCs, TPH	2-4	10-12	
	25-MW1	1.8	26-28	VOCs, TPH	26-28	28-30	
	66-B1	30	2-4	VOCs, TPH	2-4	12-14	
	66-MW1	3.5	2-4	VOCs, TPH	2-4	18-20	
	26-B1	0	–	VOCs, TPH	6-8	8-10	
	26-B2	0	–	VOCs, TPH	6-8	8-10	
	26-MW1	1.5	20-22	VOCs, TPH	2-4	18-20	
	26-MW2	0.5	26-28	VOCs, TPH	8-10	18-20	
	26-MW3	2	4-6	VOCs, TPH	4-6	18-20	
	38-B1	0	–	VOCs, TPH	6-8	10-12	
	38-B2	0.5	10-12	VOCs, TPH	6-8	10-12	

(1) Headspace screening results from all samples are presented in Appendix D
All intervals are expressed in feet below ground surface

Groundwater monitoring wells were constructed as described in the work plan. Well construction logs are presented in Appendix C of this report. Following installation, each well was developed by pumping, and surging, to remove fine soil particles from around the well screens and to remove residual drill cuttings from the screened interval of each boring. Purge water was containerized and removed from the site for disposal.

Since removal of fine soil particles was the primary goal of well development, water chemistry was not monitored during the purging exercise. Wells were purged until the purge water was visibly clear or for a maximum of four hours (pumping rate of approximately one gallon per minute). Because many of the wells were set in fine silty soil, many of the wells did not produce clear water; the fine soil particles were drawn through the sand pack and into these wells continuously, without significant improvement in clarity.

Wells were allowed to settle for five days following development. Then the wells were purged prior to sampling, and allowed to settle again for approximately four hours prior to sample collection. This approach allowed the large particles to settle out of the water column. Water samples were collected carefully to minimize resuspension of the soil into the water.

One round of groundwater sampling and analysis was conducted. Groundwater samples were collected for TPH from each of the onsite monitoring wells. Additional samples were collected from selected wells for VOCs analysis. Table 3-4 describes groundwater samples that were collected. Samples for VOCs were collected from locations where former USTs were used for gasoline and waste oil storage, and at locations close to known CERCLA sites.

Field measurements of pH, temperature, and conductivity were conducted prior to purging and after each well volume, to determine stabilization of water chemistry prior to sample collection. At the start of sample collection, final pH, temperature, specific conductivity, and dissolved oxygen readings were recorded. Samples were poured directly from bailers or dedicated pumps into appropriate sample containers and preserved according to requirements described in the work plan. All non-disposable sampling equipment was decontaminated prior to use and between each well, as described in Section 3.7 of the work plan. All pertinent field sampling data was recorded on appropriate sample log sheets or in the Site Log Book.

TABLE 3-4
GROUNDWATER SAMPLES COLLECTED
FORMER NCBC UST INVESTIGATION
DAVISVILLE RHODE ISLAND

UST AREA	Well No.	Well Screened Interval	Depth to Water	Max FID Reading	Interval of Max FID Reading
A1	3-MW1	9-19	11.58	0.2	4-6
	6-MW1	9-19	13.23	0.5	16-18
	11-MW1	9-19	12.48	>1000	12-14
	11-MW2	9-19	12.00	0	-
	11-MW3	9-19	12.72	>1000	12-14
B	56-MW1	9-19	7.34	>1000	8-10
	58-MW1	9.5-19.5	5.27	1	4-6
D1	46-MW1	6.5-13.5	5.57	100	4-6
	46-MW2	3.5-8.5	6.14	800	4-6
	47-MW1	6-16	5.28	>1000	2-4
	48-MW1	9.5-19.5	6.06	>1000	4-6
	48-MW2	4-9	4.89	700	6-8
	62-MW1	9.5-19.5	7.81	200	2-4
	63-MW1	4-9	5.51	100	4-6
	71-MW1	9.5-19.5	6.31	100	6-8
	65-MW1	8-13	9.45	0	-
D2	10-MW1	7-12	4.77	250	4-6
	10-MW2	6-16	4.83	10	6-8
E	68-MW1	4-10	3.18	>1000	2-4
F1	25-MW1	20-30	19.95	1.8	26-28
	26-MW1	19-29	21.01	1.5	20-22
	26-MW2	20-30	21.06	0.5	26-28
	26-MW3	20-30	20.55	2	4-6
	66-MW1	20-30	21.74	3.5	2-4

All invervals are expressed in feet below ground surface

3.2 QUALITY CONTROL SAMPLE COLLECTION

Quality control samples were collected to ensure procedures followed are adequate to protect sample integrity. These included:

- Rinsate blanks - Laboratory grade water run across decontaminated sampling devices to assure no contaminants remain after decontamination

- Trip blanks - Laboratory grade water in sealed sample containers that accompany each shipping container to identify cross contamination between sealed sample containers

- Duplicates - Split samples shipped "blind" to the laboratory to identify discrepancies in analytical results

- Field blanks - Samples of each water source used for decontamination and as a medium for rinsate or trip blanks identified above

3.3 DATA VALIDATION

The Naval Energy and Environmental Support Activity (NEESA) guidance document (NEESA 20.2-057.04) describes minimum validation criteria that were used in evaluating analytical data for Level C analysis. This procedure accounts for adherence to holding times, initial calibration, continuing calibration, and blank versus sample results. Additional procedures are specific to the analytical methods used.

Dilution factors, percent solids, and aliquots used for analysis were taken into consideration prior to the application of all data qualifiers. Methylene chloride, acetone, and vinyl acetate were detected in the low level laboratory blank analyses.

The data for these analyses were reviewed with reference to the EPA "Functional Guidelines for Organic Data Validation" (March 1990). EPA Region I has not yet released regional amendments updating the existing EPA Region I February 1988 National Functional Guidelines modifications to address the March 1990 analytical protocol. Quality requirements outlined in the NEESA guidelines document entitled Sampling and Chemical Analysis Quality Assurance requirements for the Navy Installation Restoration Program (NEESA 20.2-047B; 6/88) were also referenced.

4.0 FINDINGS OF THE INVESTIGATION

Section 4.0 presents a summary of the findings of this investigation, and also describes findings of previous investigations performed at the NCBC by HNUS and others that are relevant to the UST sites described in this report.

4.1 GEOLOGICAL/HYDROGEOLOGICAL CONDITIONS

This section presents the results of soil boring/test pit activities conducted at sites A1, A2, B, D1, D2, E, and F1 during the UST remedial investigation as they relate to the site geology and hydrogeology. Additional soil boring information was obtained from previous investigations conducted by HNUS (HNUS, 1994), basewide RI activities conducted by the TRC Environmental Corporation (TRC, 1993, 1994), and the initial assessment study by Fred C. Hart Associates (FCHA, 1984).

4.1.1 NCBC Davisville

The NCBC-Davisville is located within the southern portion of the Narragansett Basin, which is underlain primarily by the Rhode Island Formation. The bedrock is folded and metamorphosed. Varying assemblages of quartz-mica-schist are mapped locally. Outcroppings are scattered in the vicinity of NCBC.

Unconsolidated sediments in the NCBC-Davisville area are glacial and were eroded and transported during the most recent glacial advance, filling the existing valleys (Schafer, 1961). Overburden deposits are comprised of glacial till and outwash consisting of sand, silt, clay, and gravel.

The till is characteristically poorly sorted, dense, and variable in texture. Outwash deposits from glacial meltwaters are composed of sorted sands, silts, and gravels deposited in streams (glaciofluvial deposits) or lakes (glaciolacustrine deposits). These units are characteristically less dense and more permeable than till.

Post-glacial deposits, including shore, swamp, and marsh deposits have also been identified in the NCBC-Davisville area. The shore deposits are derived from shoreline marine processes and are composed of sands and gravels. The swamp deposits occur in freshwater swamps and salt water marshes and generally consist of organic peat and inorganic silt (Schafer, 1961). The NCBC-Davisville area has been extensively altered by construction activities and emplacement of artificial fill materials.

4.1.2 UST Areas A1 and A2

This section summarizes the geologic and hydrogeologic data collected at UST Areas A1 and A2.

Site Geology

Surficial materials at UST Areas A1 and A2 include outwash deposits consisting of fine to medium sand, silty sand, and medium sand with fine gravel interbeds. The sand layers were poorly graded, and some were bedded and/or cross-stratified. The fine to medium sand, silty sand, and medium sand with fine gravel interbeds sequence was observed to a depth of 20 feet in borings 6-MW1, 11-MW1, and 3-MW1. Results of previous studies conducted in the vicinity of building 56 (HNUS, 1994) show a sequence of fine to coarse sand and silty sand with thin silt and gravel interbeds to a depth of 64 feet. The boring at Building 56 was continued through silty gravelly sand units to a depth of 81 feet where refusal was encountered in a dense sand unit with numerous boulders.

There is no site-specific bedrock information available at UST Areas A1 and A2.

Site Hydrogeology

The depth to groundwater was determined during well development in July 1994. The depth to groundwater in UST Areas A1 and A2 ranged from 11.5 to 13.5 feet below the ground surface. The unsaturated zone at UST Areas A1 and A2 is comprised of silty sand, fine sand, and medium sand. The total saturated thickness of the aquifer was not determined.

Previous investigations (TRC, 1993) have indicated that groundwater movement at UST Areas A1 and A2 is approximately south to south-southeast. No high conductivity areas were delineated in this study, and most man-made barriers and conduits for preferential contaminant migration, such as underground utility corridors, are located in the unsaturated zone. Underground utilities consist of natural gas, sanitary sewer, water, and storm drains. The utility corridors are aligned southwest northeast and southeast - northwest. The water table could intersect the utility conduits as a result of Seasonal fluctuations of the water table elevation, but this condition has not been evaluated.

Aquifer parameters were not determined quantitatively during the UST remedial investigation, however the hydraulic conductivity can be estimated from values found in Groundwater (Freeze and Cherry, 1979). The transmissivity was not determined because the saturated thickness of the aquifer at UST Areas A1 and A2 is not known.

4.1.3 UST Area B

This section summarizes the geologic and hydrogeologic data collected at UST AREA B.

Site Geology

Surficial materials at UST Area B are comprised of fill and outwash deposits. The fill is comprised of concrete chips, fine to coarse sand, and silty fine sand. The outwash consists of sand with varying amounts of silt and organic-rich soil. The upper 10 feet of boring 56-MW1 is dominated by silty fine sand with peat-like material and coarse gravel. The interval 10 to 15 feet below the ground surface is comprised of fine-coarse sand with some coarse gravel. The remainder of the boring is comprised of silty fine sand and gravel. Boring 58-B2, in proximity to former UST 58, contained concrete chips in the interval 4 to 6 feet below ground, indicating fill material.

There is no site-specific bedrock information available at UST Area B.

Site Hydrogeology

The depth to groundwater was determined during well development in August 1994. The depth to groundwater in this area ranged from 5.0 to 7.5 feet below the ground surface. The unsaturated zone at UST Area B is comprised of silty fine sand and some medium sand. The saturated thickness of the aquifer was not determined because the total aquifer thickness has not been determined.

Previous investigations (TRC, 1993) have indicated that groundwater movement at UST Area B is approximately west-southwest. No natural high conductivity areas were delineated in this study, and most man-made barriers and conduits for contaminant migration (underground utility corridors) are located in the unsaturated zone. Underground utilities consist of natural gas, sanitary sewer, water, and storm drains. The utility corridors are aligned north-south and east-west. Seasonal fluctuations of the water table could cause groundwater to intersect the utility conduits, but this condition has not been evaluated.

The transmissivity was not determined because the saturated thickness of the aquifer at UST Area B is not known.

4.1.4 UST Area D1

This section summarizes the site geologic and hydrogeologic data collected at UST Area D1.

Site Geology

Surficial materials at UST Area D1 include fill and outwash deposits. Fill is comprised of black, silty fine to medium sand, brick chips, and concrete chips. Outwash deposits are comprised of silt, fine to medium sand, silty sand, and fine to coarse gravel. This sequence was observed to a depth of 20 feet in borings 62-MW1 and 71-MW1.

Depth to bedrock ranges from 16 feet below the ground surface on the western side of UST Area D1 to approximately 30 feet below ground on the north and east sides of the site (TRC, 1994). The bedrock is comprised of quartz-mica schist (HNUS, 1994).

Site Hydrogeology

The depth to groundwater was determined during well development in August 1994. The depth to groundwater ranged from 5.0 to 9.5 feet below the ground surface. The unsaturated zone at UST Area D1 is comprised of silty sand, fine to medium sand, and fine to coarse gravel. The total aquifer thickness is approximately 15 to 29 feet.

Previous investigations (TRC, 1993) have indicated that groundwater movement at UST Area D1 is approximately southwest. Fine to coarse gravel observed in borings 62-MW1, 65-MW1, and 71-MW1 may provide preferential flow paths for contaminants, depending on their lateral extent and silt content. Most man-made barriers and conduits for contaminant migration (underground utility corridors) are located close to the water table, and may influence the flow of contaminants. Underground utilities consist of steam lines, sanitary sewer, water, and storm drains. The utility corridors are aligned north-south and east-west. Seasonal fluctuations of the water table could cause groundwater to intersect the utility conduits, but this condition has not been evaluated.

Aquifer parameters were determined by TRC during Phase I of the RI. The estimated hydraulic conductivity calculated by slug tests performed at the west side of the site ranges from 2.1 feet/day to 19.2 feet/day, and the transmissivity ranges from 47.5 square feet/day to 335.9 square feet/day. The saturated thickness increases to the east; therefore the transmissivity should increase to the east.

4.1.5 UST Area D2

This section summarizes the site geologic and hydrogeologic data collected at UST Area D2.

Site Geology

Surficial materials at UST Area D2 include outwash deposits consisting of silty sand, medium to coarse sand, and fine gravel. Boring 10-MW1 is comprised of alternating areas of silty sand and gravelly silty sand from 2 to 8 feet below ground and areas of fine sand to medium sand with trace amounts of coarse gravel from 8 to 14 feet below ground. Additional boring information to the north and south of UST Area D2 indicate silty sand in the interval 2 to 5 feet below ground, and coarse to medium sand and fine gravel in the interval 5 to 18 feet below ground (TRC, 1994).

Depth to bedrock ranges from 25 feet below the ground surface on the northern side of site D2 to approximately 15 feet below the ground surface on the south side of the site (TRC, 1994). The bedrock is comprised of quartz-mica schist (FCHA, 1984).

Site Hydrogeology

The depth to groundwater was determined during well development in August 1994. The depth to groundwater ranged from 4.5 to 5.0 feet below the ground surface. The unsaturated zone at UST Area D2 is comprised of silty sand and fine to medium sand. The total aquifer thickness is approximately 15 to 29 feet.

Previous investigations (TRC, 1993) have indicated that groundwater movement at UST Area D2 is approximately north-northeast. No natural high conductivity areas were delineated in this study; however, most man-made barriers and conduits for contaminant migration (underground utility corridors) are located close to the saturated zone, and may influence the flow of contaminants. Underground utilities consist of steam lines, sanitary sewer, water lines, and storm drains. The utility corridors are aligned north-south and east-west. Seasonal fluctuations of the water table could cause groundwater to intersect the utility conduits, but this condition has not been evaluated.

Aquifer parameters were determined east of UST Area D2 by TRC during Phase I of the RI (TRC, 1993). The hydraulic conductivity calculated by slug tests performed to the east of the site ranged from 3.0 ft/day to 25.6 ft/day. The transmissivity ranged from 42.2 square feet/day to 346.2 square feet/day. The saturated thickness decreases to the west, therefore, the transmissivity should decrease.

4.1.6 UST Area E

This section summarizes the site geologic and hydrogeologic data collected at UST Area E.

Site Geology

Surficial materials at UST Area E are comprised of outwash deposits consisting of fine to medium sand, silty sand, and gravely silty sand. This sequence was observed to a depth of 20 feet in borings 68-MW1, 68-B1, and 68-B2. The bottom of the borings is comprised of silty sand and fine sand.

There is no site-specific bedrock information available at UST Area E.

Site Hydrogeology

The depth to groundwater was determined during well development. The depth to groundwater ranged from 4 to 5 feet below the ground surface. The unsaturated zone at UST Area E is comprised of silty sand and fine sand. The saturated thickness of the aquifer was not determined because the total aquifer thickness has not been determined.

Previous investigations (TRC, 1993) have indicated that groundwater movement at UST Area E is approximately west-southwest. No natural high conductivity areas were determined in this study to act as preferential flow paths, and most man-made barriers and conduits for contaminant migration (underground utility corridors) are located in the unsaturated zone. Underground utilities consist of sanitary sewer, water, and storm drains. The utility corridors are aligned north - south and northwest - southeast. Seasonal fluctuations of the water table could cause groundwater to intersect the utility conduits, but this condition has not been evaluated.

Aquifer parameters were not determined quantitatively during the UST remedial investigation, however the hydraulic conductivity can be estimated from values found in Groundwater (Freeze and Cherry, 1979). The transmissivity was not determined because the saturated thickness of the aquifer at UST Area E is not known.

4.1.7 UST Area F1

This section summarizes the site geologic and hydrogeologic data collected at UST Area F1.

Site Geology

The surficial materials at UST Area F1 are comprised of fill and outwash deposits. The outwash is comprised of silty sand with layers of coarse to fine sand, gravelly silty sand, and fine and coarse gravel located at the north side of the site. Unconsolidated materials at the south side of site F1 are

comprised of gravelly silty sand, silty sand, and fill. The fill is comprised of dark brown fine silty sand, gravelly silty sand, concrete chips, nails, and pieces of brick. The fill is approximately 12 feet thick in proximity to UST location 37-40.

Previous investigations by HNUS (1994) and TRC (1994) have also characterized the unconsolidated materials as outwash deposits comprised of fine - coarse sand, medium - coarse sand, and coarse sand with varying amounts of silt and gravel.

Depth to bedrock ranges from 68 feet below the ground surface on the southern side of Area F1 to approximately 50 feet below the ground surface at the center of the site (TRC, 1994). The bedrock is comprised of quartz-mica schist (FCHA, 1984).

Site Hydrogeology

The depth to groundwater was determined during well development in August 1994. The depth to groundwater ranged from 19.5 to 22.0 feet below the ground surface. The unsaturated zone at UST Area F1 is comprised of silty sand, fine to coarse sand, gravelly silty sand, and fine gravel. The total aquifer thickness is approximately 50 to 60 feet.

Previous investigations (TRC, 1993) have indicated that groundwater movement at UST Area F1 is approximately north-northeast. Fine and coarse gravel observed in boring 10-MW1 may provide a preferential flow path for contaminants, depending on the lateral extent. Most man-made barriers and conduits for contaminant migration (underground utility corridors) are located in the unsaturated zone, and are significantly above the water table. Underground utilities consist of steam lines, water, and storm drains. The utility corridors are aligned north-south and east-west. The possibility of contaminant flow along these corridors is minimal.

Aquifer parameters were determined south of UST Area F1 by TRC (1994) during Phase I of the RI. The hydraulic conductivity along the southern border of the site ranged from 25.9 feet/day to 50.2 ft/day. The transmissivity ranged from 680 square feet/day to 1664 square feet/day. The saturated thickness increases to the west and south therefore the transmissivity should increase.

4.2 ANALYTICAL DATA SUMMARY

The following subsections describe the analytical data findings of the investigation activities described in Section 3.0 of this report. The descriptions are limited to the activities performed, analytical data from chemical analyses of samples, the geologists' records of the soil encountered, and the physical

characteristics of each former UST area. The implications of this data previous data and other information pertinent to the investigation are presented in Sections 5 and 6 of this report.

Four former UST locations were re-excavated as test pits. These locations were selected as test pits based on characteristics described in Section 3.2. Samples were collected and analyzed for TPH from all test pits excavated. Additional samples were collected and analyzed for VOCs at one former location because records indicate that it was used for waste oil storage.

Fifty-six borings were installed at 20 former UST locations at the base. These locations were selected based on characteristics described in Section 3.2. Between two and five borings were installed at each location. Continuous samples were collected during the advancement of borings and screened by headspace analysis.

Twenty-four borings were finished as groundwater monitoring wells, as described in Section 3.0 of this report. Groundwater was collected from these wells for laboratory analysis during one round of sampling.

The screening results for soil samples collected are presented in Appendix D. Summaries of the laboratory results for soil and groundwater samples collected at each UST location are presented in the following subsections. A complete set of laboratory analytical data is presented in Appendix E.

4.2.1 UST Area A1

Fifteen soil borings and two test pit explorations were performed in UST Area A1 as described below:

UST Location 3:

Three soil borings were installed in the vicinity of UST Location 3. Soil samples were collected for TPH and headspace screening analysis, as described in Section 3.0 of this report. Figure 4-1 presents underground utilities, the UST location, well and boring locations, and concentrations of TPH found by laboratory analysis.

Continuous samples were collected to a depth of 12 feet in two of these borings, and to a depth of 20 feet in one boring. The boring logs indicate soil in this area consist of fine, light-colored, silty sand extending from immediately below asphalt to the bottom of the borings. This sand is assumed to be naturally occurring in Area A1, because it was found in all borings and test pits installed.

Groundwater was found at approximately 11 feet below ground surface. One well was installed, as shown on Figure 4-1. Groundwater was sampled from this well for TPH analysis.

Headspace screening of samples indicated low VOC content in the soil (maximum of 4 ppm). This finding was supported by the presence of low concentrations of TPH in the soil samples selected for laboratory analysis (maximum 160 mg/kg). No TPH was detected in the shallow water table well at this location.

UST Location 5:

Two soil borings were installed in the vicinity of UST Location 5. Soil samples were collected for TPH and headspace screening analysis, as described in Section 3.0. Figure 4-2 presents underground utilities, the UST location, boring locations, and concentrations of TPH detected by laboratory analysis.

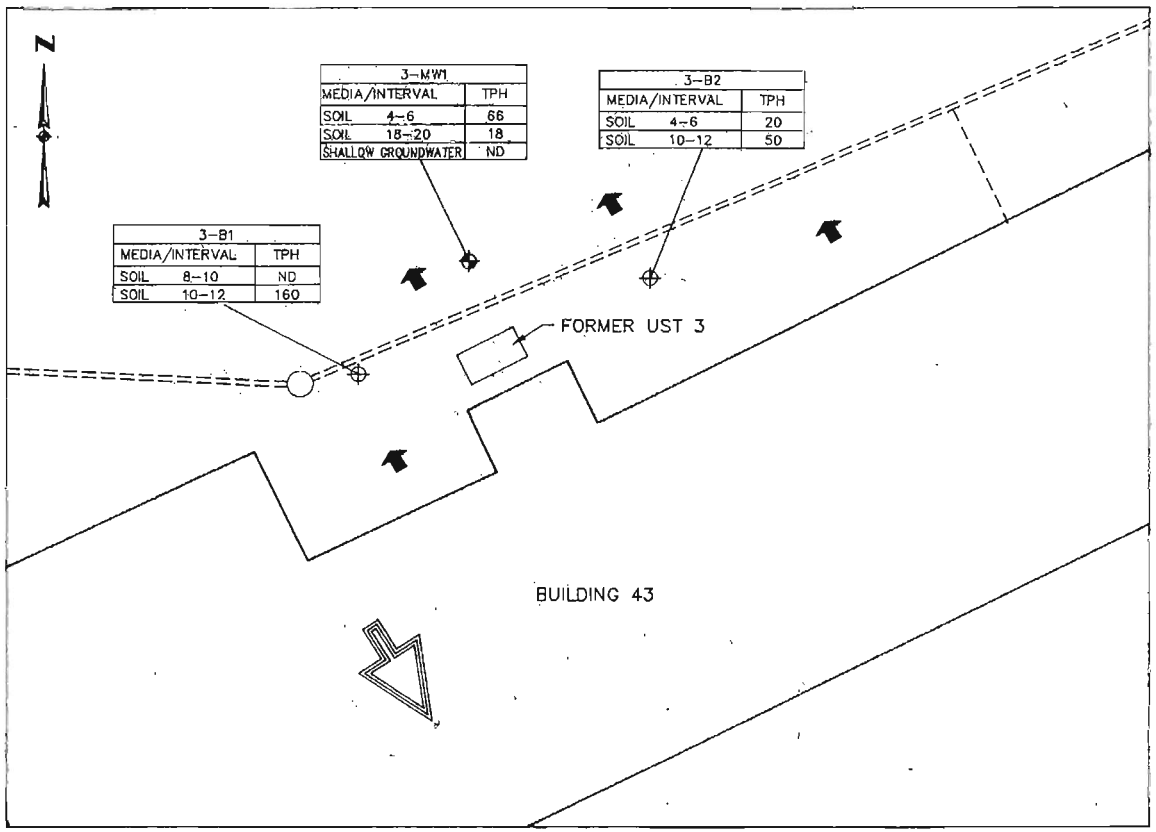
Continuous samples were collected to a depth of 12 feet in one of these borings, and to a depth of 10 feet in the second. The boring logs indicate soil in this area consist of a fine, brown, sand fill extending from surface to almost 8 feet below ground surface. A fine, light-colored, silty sand lying below that is assumed to be naturally occurring in Area A1 because it was found in all borings and test pits installed.

Groundwater was not encountered in these borings. However, groundwater was found at approximately 11 feet below ground surface at UST location 6, which is less than 100 feet to the southwest (cross-gradient).

Headspace screening of samples indicated low VOC content in the soil. Trace headspace VOCs were detected in boring 5-B2, and a maximum of 50 ppm headspace VOCs was detected in boring 5-B1, at a depth of 4 to 6 feet below ground surface. TPH was detected by laboratory analysis (maximum concentration of 1300 mg/kg 8 to 10 feet in boring 5-B1). Low concentrations of TPH were detected in boring 5-B2. These results indicate that there is likely to be a limited volume of contaminated soil under the abandoned UST at this location.

UST Location 6:

Three soil borings were installed in the vicinity of UST Location 6. Soil samples were collected for TPH and headspace screening analysis, as described in Section 3.0. Figure 4-3 presents underground utilities, the UST location, boring locations, and concentrations of TPH found by laboratory analysis.



SCALE

0 20 40

1 inch = 20 feet

LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH -TOTAL PETROLEUM HYDROCARBONS
ND -NONE DETECTED

Sample intervals are expressed in feet below ground surface.
Analytical results for soil are expressed in mg/kg.
Analytical results for groundwater area expressed in mg/l.

-MONITORING WELL

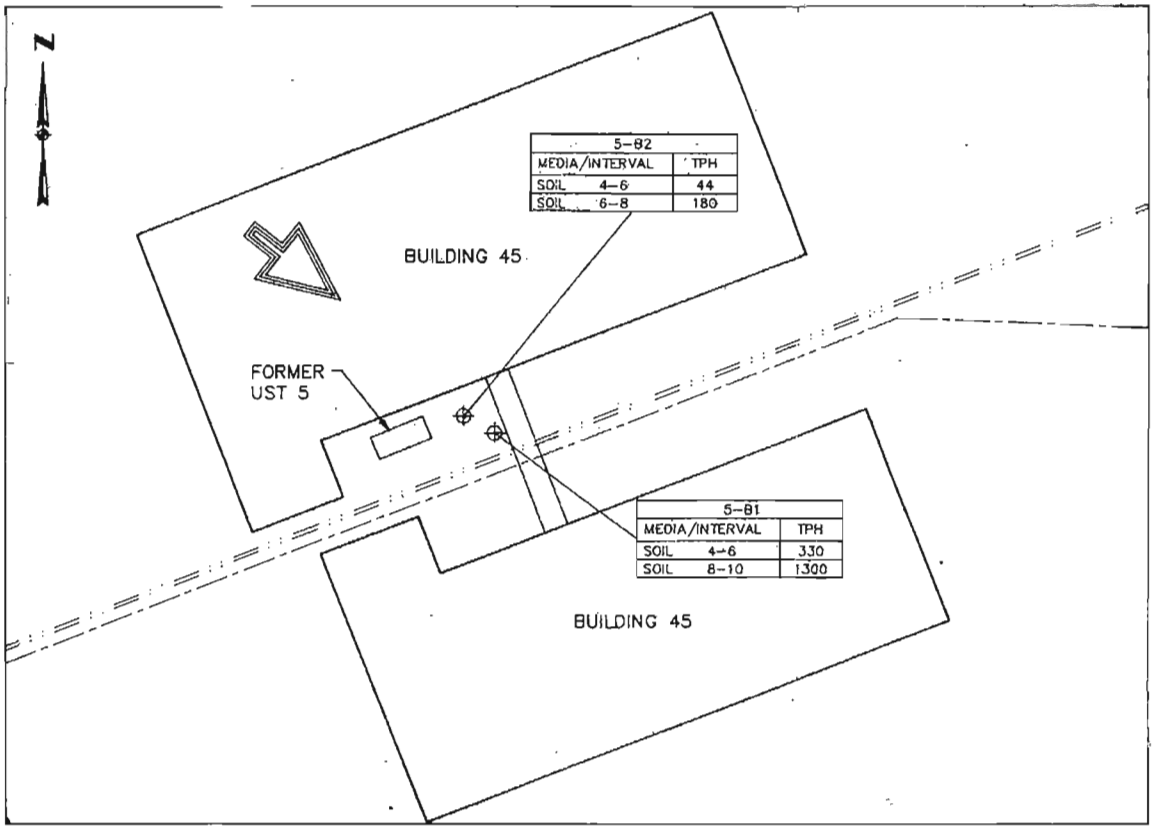
-SOIL BORING

-BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992.
Location of former UST piping unknown.

FIGURE 4-1
MAP AND ANALYTICAL RESULTS
UST LOCATION 3
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)
SCALE: 1" = 20'	DATE: DECEMBER 1994
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-1.DWG — REV: 1



SCALE

0 20 40

1 inch = 20 feet

LEGEND

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH —TOTAL PETROLEUM HYDROCARBONS

Sample intervals are expressed in feet below ground surface.
Analytical results for soil are expressed in mg/kg.
Analytical results for groundwater area expressed in mg/l.

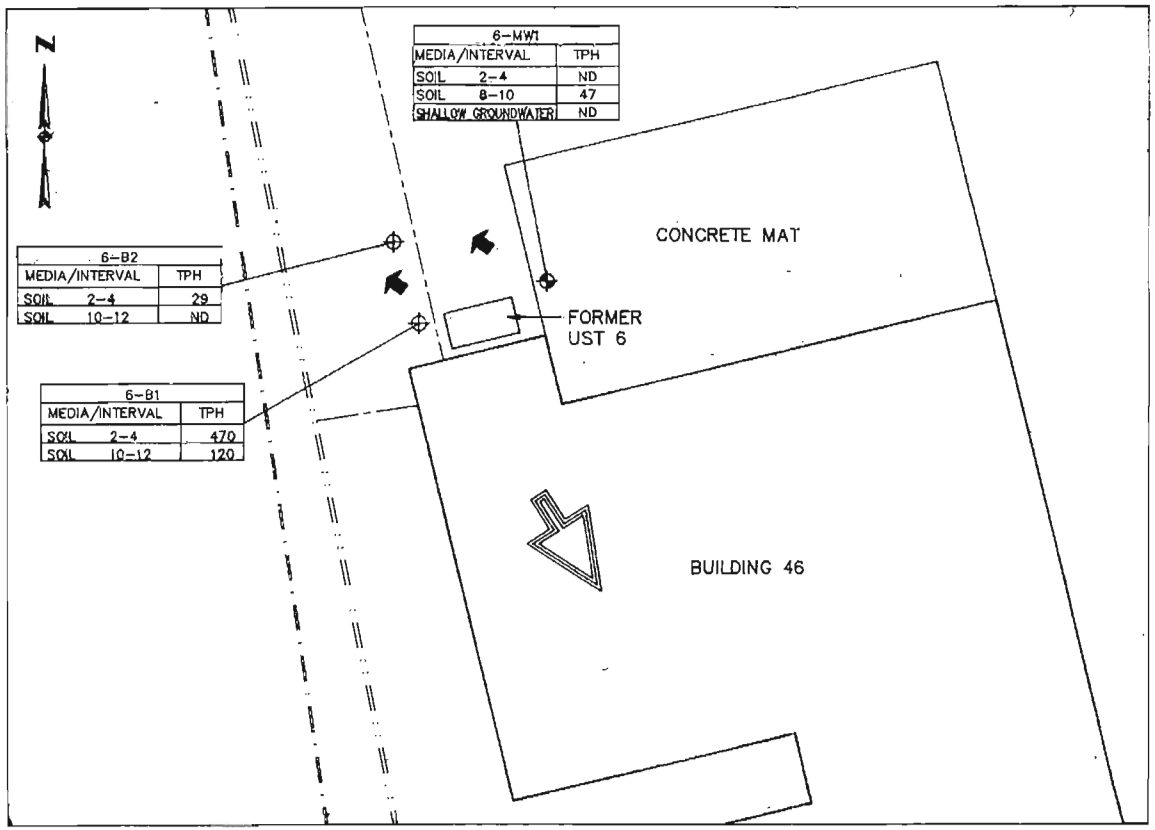
—SOIL BORING

—BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992.
Location of former UST piping unknown.

FIGURE 4-2
MAP AND ANALYTICAL RESULTS
UST LOCATION 5
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)	
SCALE: 1" = 20'	DATE: DECEMBER 1994	
DRAWING No.:	AC FILE No.: G:\DWG\DAVIS\94-95FIG\FIG_4-2.DWG	REV: 1



SCALE

0 20 40

1 inch = 20 feet

LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH -TOTAL PETROLEUM HYDROCARBONS
ND -NONE DETECTED

Sample intervals are expressed in feet below ground surface.
Analytical results for soil are expressed in mg/kg.
Analytical results for groundwater area expressed in mg/l.

-MONITORING WELL

-SOIL BORING

-BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992. Location of former UST piping unknown.

FIGURE 4-3
MAP AND ANALYTICAL RESULTS
UST LOCATION 6
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)	
SCALE: 1" = 20'	DATE: DECEMBER 1994	
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-3.DWG	REV: 1

Continuous samples were collected to a depth of 12 feet in two of these borings, and to a depth of 20 feet in the third boring. The boring logs indicate soil in this area consist of fine light colored silty sand extending from immediately below asphalt to the bottom of the borings. This sand is assumed to be naturally occurring in Area A1, because it was found in all borings and test pits installed.

Groundwater was found at approximately 11 feet below ground surface. One well was installed, as shown on Figure 4-3. Groundwater was collected from this well for TPH analysis.

Headspace screening of samples indicated low VOC content in the soil (maximum of 4 ppm). This finding was supported in borings 6-MW1 and 6-B2 by the presence of low concentrations of TPH in the soil samples selected for laboratory analysis. However, samples selected for laboratory analysis from boring 6-B1 exhibited moderate concentrations of TPH (470 mg/kg at a depth of 2 to 4 feet, and 120 mg/kg at depth of 10 to 12 feet).

No TPH was detected in the shallow water table well at this location.

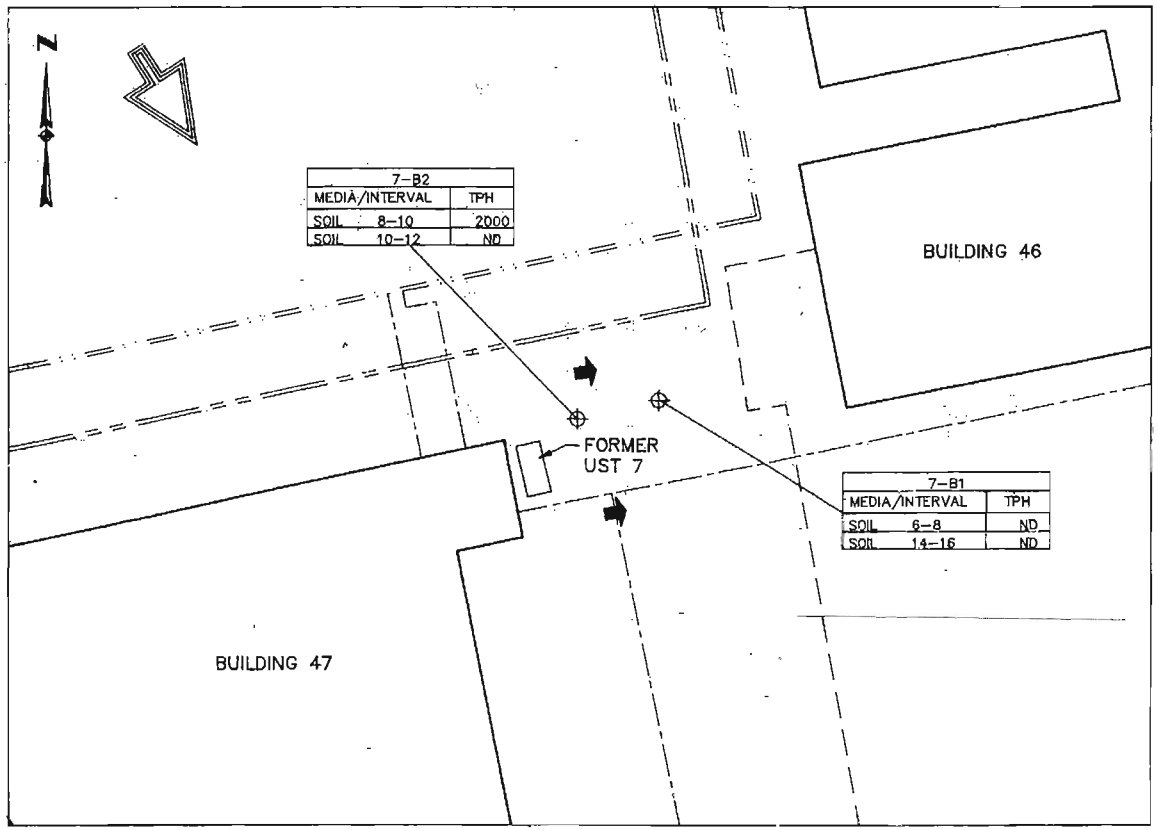
These results indicate that there may be a limited volume of contaminated soil immediately southwest of the former UST at this location. VOCs were not detected by headspace screening. TPH may be present as residual from an old release, where the volatile organic materials have dissipated.

UST Location 7:

Two soil borings were installed in the vicinity of UST location 7. Soil samples were collected for TPH and headspace screening analysis, as described in Section 3.0. Figure 4-4 presents underground utilities, the UST location, boring locations, and concentrations of TPH detected by laboratory analysis.

Continuous samples were collected to a depth of 16 feet in one of these borings, and to a depth of 12 feet in the second. The boring logs indicate soil in this area consist of a fine, light-colored, silty sand lying below which is assumed to be naturally occurring in Area A1 because it was found in all borings and test pits installed.

Headspace screening of samples indicated low VOC content in the soil. No headspace VOCs were detected in boring 7-B1, and a maximum of 20 ppm headspace VOCs was detected in boring 7-B2, at a depth of 6 to 10 feet below ground surface. This finding was partially supported by the fact that no TPH was detected in laboratory samples collected from Area B1. A high concentration of TPH was detected at the 8 to 10 foot interval of B2, indicating that there is TPH residue at that interval, although the headspace analysis indicates a low associated headspace VOC concentration.



SCALE

0 20 40

1 inch = 20 feet

LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH –TOTAL PETROLEUM HYDROCARBONS
ND –NONE DETECTED

Sample intervals are expressed in feet below ground surface.
Analytical results for soil are expressed in mg/kg.
Analytical results for groundwater area expressed in mg/l.

–SOIL BORING

–BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992.
Location of former UST piping unknown.

FIGURE 4-4
MAP AND ANALYTICAL RESULTS
UST LOCATION 7
FORMER NCBC DAVISVILLE, RI

CLIENT:	U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)	
SCALE:	1" = 20'	DATE: DECEMBER 1994	
DRAWING No.:		AC FILE No.: G:\DWG\DAVIS\94-95FIG\FIG_4-4.DWG	REV: 1

These results indicate that there may be some contaminated soil to the east of the UST location. In addition, VOCs were not detected by headspace screening. The TPH present may be residue from an old release, where the volatile organic materials have dissipated.

UST Location 8:

UST Location 8 is presented on Figure 4-5. This figure shows underground utilities, the former location of the UST, locations of samples collected, the approximate location of the test pit in relation to the former UST and Building 48, and a summary of results from samples collected for laboratory analysis.

Two test pit excavations were performed in this area on the north side of Building 48. The first was performed at what was expected to be the north end of the former UST and the second was performed at what was expected to be the south end of the former UST.

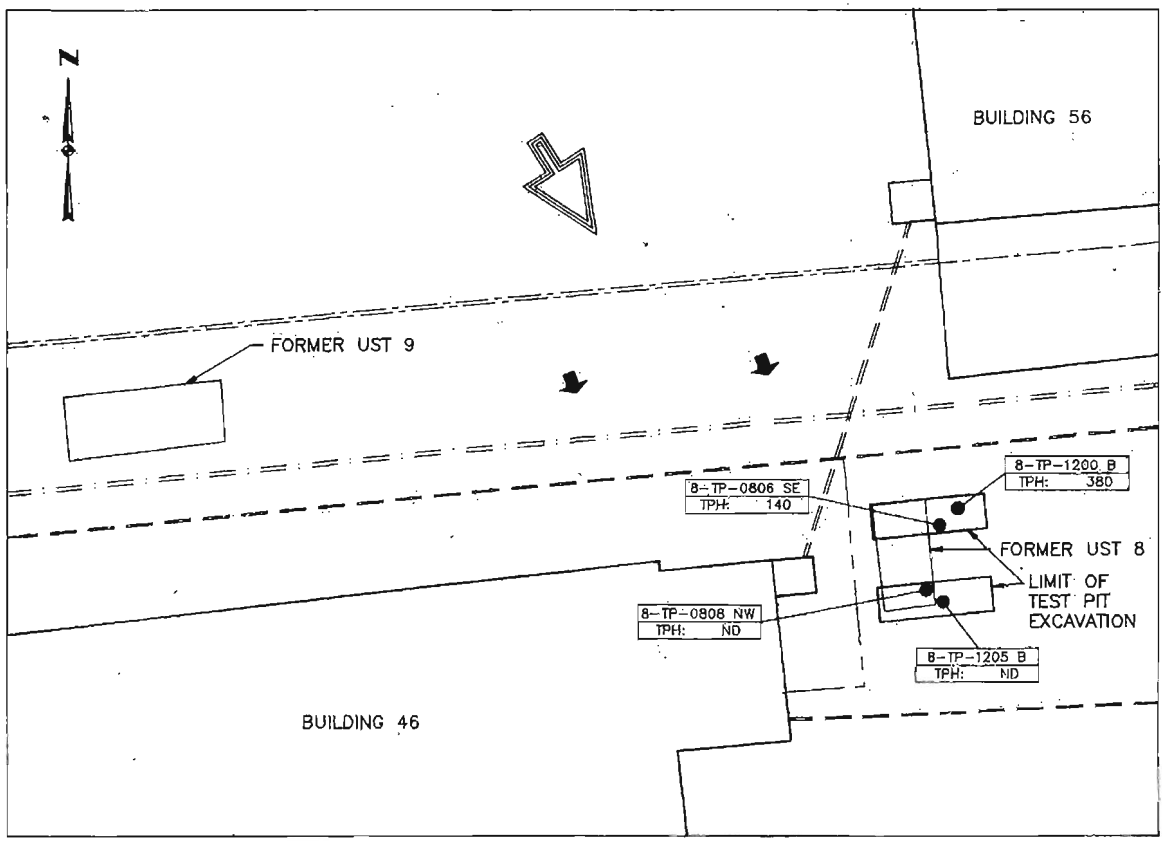
The tank bedding material was found to consist of 1 to 2 feet of a red-brown, very coarse sand and gravel which was underlain by fine, light-colored, silty sand, the natural underlying material in Areas A1 and A2.

Four discrete soil samples (plus one duplicate sample) were collected from the bottoms and sides of these excavations, screened for headspace VOCs, and analyzed for TPH to confirm the absence of contaminated soil. No headspace VOCs were detected in any of the samples collected from either excavation. The samples collected from one excavation showed no TPH detected. The samples from the second excavation showed TPH between 140 and 380 mg/kg. Since no VOCs were detected by headspace analysis, the TPH is most likely residual from an old release, where the volatile fractions may have dissipated.

Groundwater was not encountered during the execution of this excavation. No borings or monitoring wells were installed.

UST Location 9:

UST Location 9 is presented on Figure 4-6. This figure shows underground utilities, the former location of the UST, the approximate locations of the test pits in relation to the former UST and Building 48, and a summary of results from samples collected for laboratory analysis.



SCALE

0 10 20

1 inch = 10 feet

LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW

TPH –TOTAL PETROLEUM HYDROCARBONS
ND –NONE DETECTED

Sample intervals are expressed in feet below ground surface.
Analytical results for soil are expressed in mg/kg.
Analytical results for groundwater area expressed in mg/l.

–TEST PIT SAMPLE LOCATION

–BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992. Location of former UST piping unknown.

FIGURE 4–5
MAP AND ANALYTICAL RESULTS
UST LOCATION 8
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472–90–D–1298 (CLEAN)	
SCALE: 1" = 10'	DATE: DECEMBER 1994	
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94–95FIG\FIG_4–5.DWG	REV: 1

One test pit excavation was performed in this area on the east side of Building 48. No VOCs were detected by headspace screening in any of the samples collected. The tank bedding material was found to consist of 1 to 2 feet of a red-brown, very coarse sand-gravel mix. This was underlain by fine, light-colored, silty sand, the natural underlying material in Areas A1 and A2.

Two discrete soil samples were collected from the bottoms and sides of this excavation and analyzed for TPH and VOCs to confirm the absence of contaminated soil. No headspace VOCs were detected in these samples. In addition, no VOCs were detected by laboratory analysis. TPH was detected in only one sample (55 mg/kg), collected at a depth of between 8 and 9 feet in the excavation.

Groundwater was not encountered during the execution of this excavation. No borings or monitoring wells were installed.

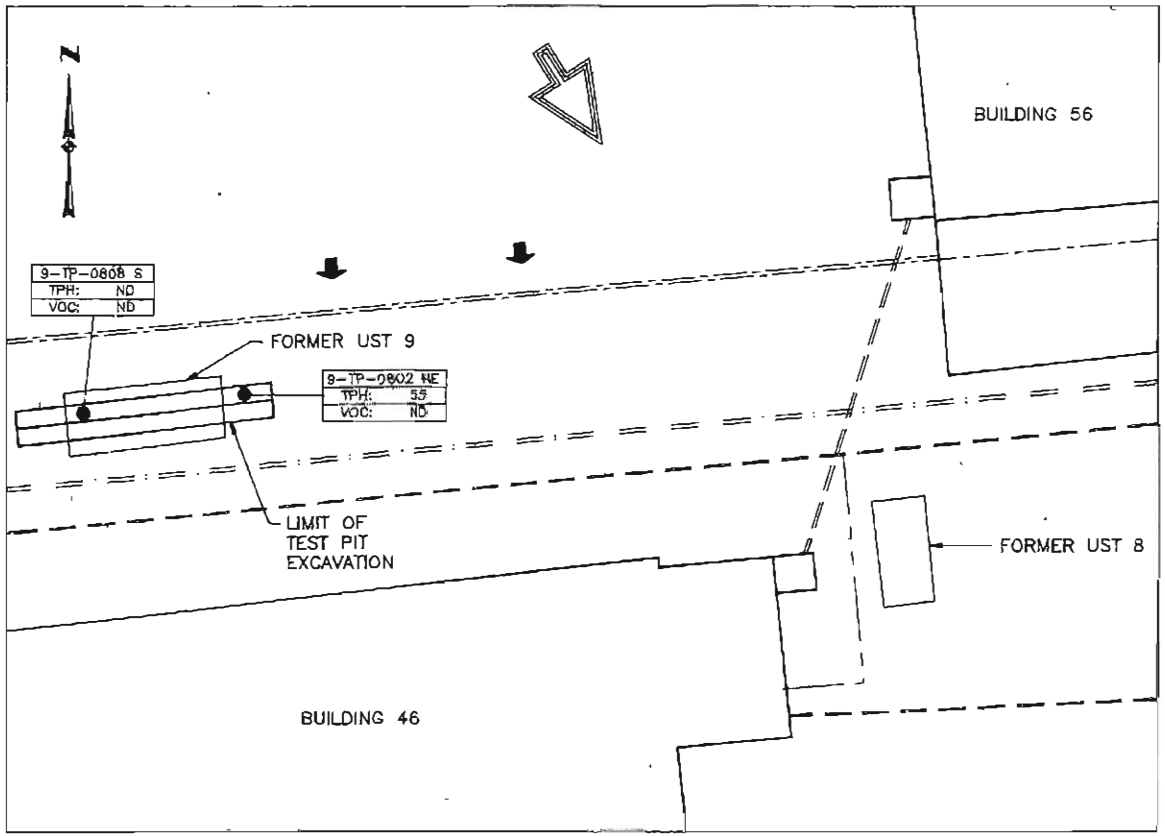
UST Location 11-22:

Five soil borings were installed in the vicinity of UST location 11-22. Soil samples were collected for TPH and VOC analysis as well as headspace screening analysis. Figure 4-7 presents underground utilities, the UST locations, boring locations, and a summary of laboratory analytical results.

Continuous samples were collected to a depth of 20 feet in four of these borings, and to a depth of 14 feet in one boring. The boring logs indicate soil in this area consist of fine, light-colored, silty sand extending from immediately below the topsoil cover to the bottoms of the borings. This sand is assumed to be naturally occurring in UST Area A1, because it was found in all borings and test pits installed.

Groundwater was found at approximately 12 feet below ground surface. Three wells were installed, as shown on Figure 4-7. Groundwater was collected from all these wells for TPH and VOC analysis.

Headspace screening of soil samples indicated high concentrations of VOCs in borings 11-MW1, 11-MW3 and 11-B2 at depths of 10 feet and more below ground surface. This finding was supported by the presence of moderate concentrations of TPH in the soil samples selected for laboratory analysis from these borings. TPH and headspace VOCs concentrations were low in borings 11-MW2 and 11-B1.



SCALE

0 10 20

1 inch = 10 feet

LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

VOC —TOTAL VOLATILE ORGANIC COMPOUNDS BY LABORATORY ANALYSIS

TPH —TOTAL PETROLEUM HYDROCARBONS

ND —NONE DETECTED

Sample intervals are expressed in feet below ground surface.
Analytical results for soil are expressed in mg/kg.
Analytical results for groundwater area expressed in mg/l.

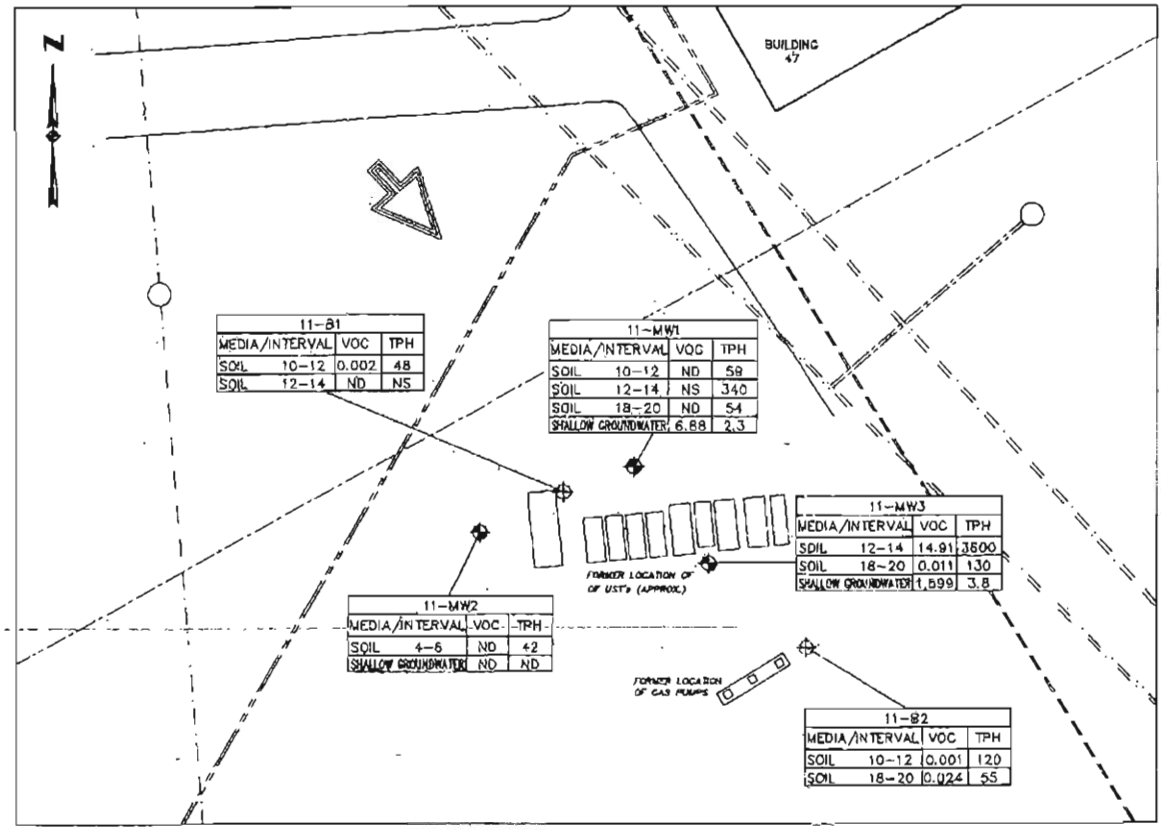
—TEST PIT SAMPLE LOCATION

—BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992.
Location of former UST piping unknown.

FIGURE 4-6
MAP AND ANALYTICAL RESULTS
UST LOCATION 9
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)	
SCALE: 1" = 10'	DATE: SEPTEMBER 1994	
DRAWING No.:	AC FILE No.: G:\DWG\DAVIS\94-06FIG\FIG_4-6.DWG	REV: 1



11-B1			
MEDIA/INTERVAL		VOC	TPH
SOIL	10-12	0.002	48
SOIL	12-14	ND	NS

11-MW1			
MEDIA/INTERVAL		VOC	TPH
SOIL	10-12	ND	59
SOIL	12-14	NS	340
SOIL	18-20	ND	54
SHALLOW GROUNDWATER		6.88	2.3

11-MW3			
MEDIA/INTERVAL		VOC	TPH
SOIL	12-14	14.91	3600
SOIL	18-20	0.011	130
SHALLOW GROUNDWATER		1,599	3.8

11-MW2			
MEDIA/INTERVAL		VOC	TPH
SOIL	4-6	ND	42
SHALLOW GROUNDWATER		ND	ND

11-B2			
MEDIA/INTERVAL		VOC	TPH
SOIL	10-12	0.001	120
SOIL	18-20	0.024	55

SCALE

0 30 60

1 inch = 30 feet

LEGEND

VOC – TOTAL VOLATILE ORGANIC COMPOUNDS BY LABORATORY ANALYSIS
TPH – TOTAL PETROLEUM HYDROCARBONS
ND – NONE DETECTED
NS – NO SAMPLE COLLECTED

Sample intervals are expressed in feet below ground surface.
Analytical results for soil are expressed in mg/kg.
Analytical results for groundwater are expressed in mg/l.

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

APPROX. LOCATION OF UST

– MONITORING WELL

– SOIL BORING

– BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992. Locations to be considered approximate. Location of former UST piping unknown.

FIGURE 4-7
MAP AND ANALYTICAL RESULTS
UST LOCATION 11-22
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)
SCALE: 1" = 30'	DATE: DECEMBER 1994
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-7 — REV: 1

VOCs were detected by laboratory analysis in soil samples collected from 11-B1, 11-B2, 11-MW1, and 11-MW3. The VOCs detected included ethylbenzene, toluene, and xylenes. Concentrations were highest at the soil sample collected from 11-MW3 at the top of the water table (12 to 14 feet below ground surface).

Analysis of groundwater samples revealed the presence of low concentrations of TPH hydrocarbons in the shallow water table in 11-MW1 and 11-MW3, corresponding with the findings of VOCs soil at these locations. Two VOC compounds, ethylbenzene and xylene, were also detected in the groundwater sample from 11-MW3. These compounds are typically associated with gasoline or light fuel oils.

These results indicate that contaminated soil exist in the area of 11-MW1, 11-MW3, and 11-B2. This contamination may extend to the south and east, but low concentrations in the borings 11-B1 and 11-MW2 indicate that the contamination probably does not extend to the north or west.

4.2.2 UST Area A2

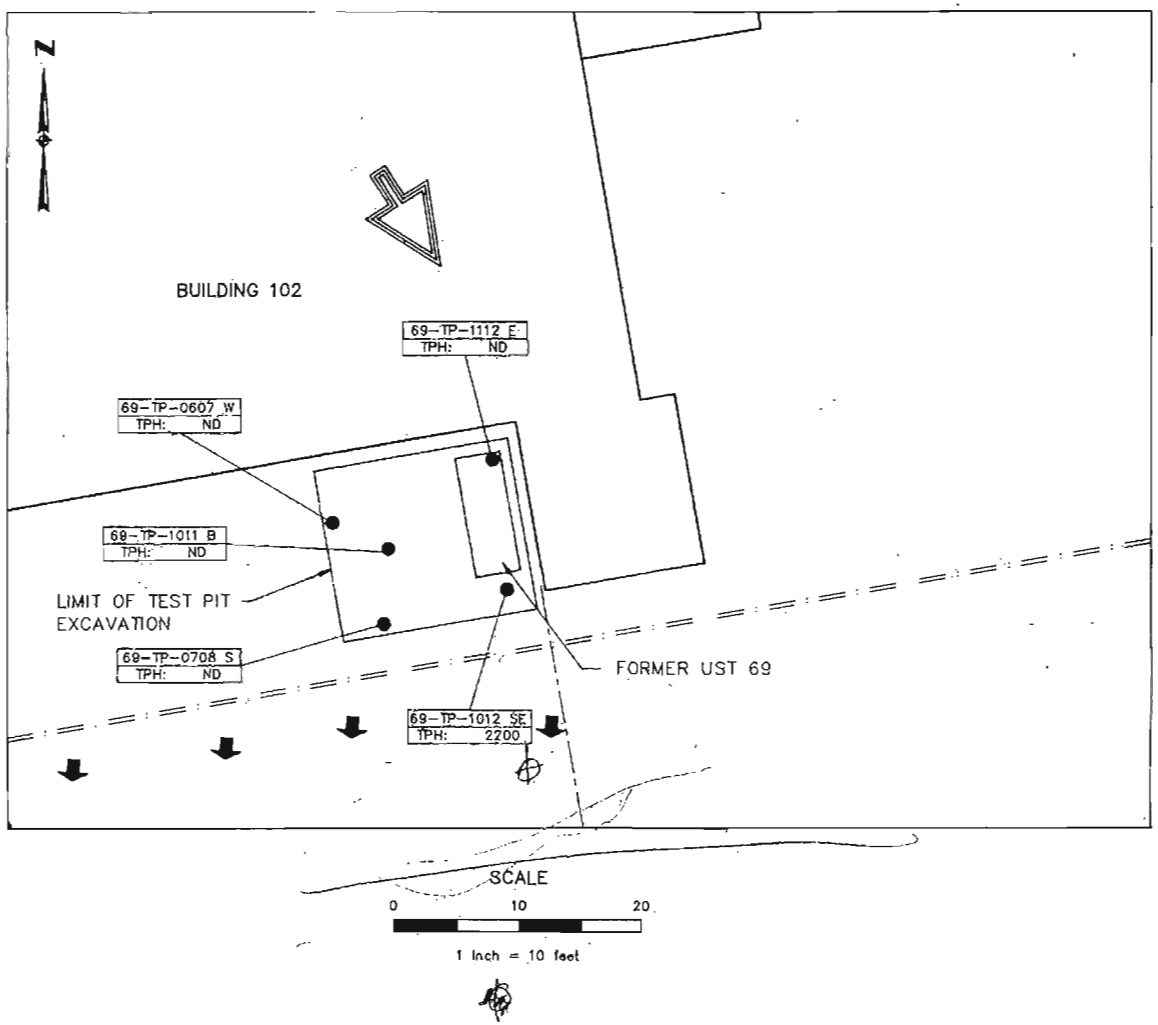
Two test pit explorations were performed in UST Area A2 as described in the following subsections:

UST Location 69:

UST location 69 is presented on Figure 4-8. This figure shows underground utilities, the former location of the UST, the approximate location of the test pit in relation to the former UST and Building 102, and a summary of results from samples collected for laboratory analysis.

The test pit log for this excavation indicates the presence of approximately 8 feet of backfill material, 1 to 2 feet of tank bedding material, that consists of a red-brown very coarse sand and gravel, and fine, light-colored, silty sand, which is the natural underlying material in Areas A1 and A2. The highest contamination by headspace analysis was found in the bedding material, although the white sand under the bedding also exhibited high concentrations of VOCs by headspace.

One excavation was performed in this area, on the southeast corner of Building 102. Contaminated soil were encountered (concentrations greater than 20 ppm by headspace analysis) at this location, at a depth of between 8 and 14 feet below ground surface. The excavation was continued to attempt to identify the extent of this contamination and acquire all soil containing greater than 20 ppm VOCs



LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH —TOTAL PETROLEUM HYDROCARBONS
ND —NONE DETECTED

Sample intervals are expressed in feet below ground surface.
Analytical results for soil are expressed in mg/kg.
Analytical results for groundwater area expressed in mg/l.

—TEST PIT SAMPLE LOCATION

—BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992. Location of former UST piping unknown.

FIGURE 4-8
MAP AND ANALYTICAL RESULTS
UST LOCATION 69
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)	
SCALE: 1" = 10'	DATE: DECEMBER 1994	
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-8.DWG	REV: 1

by headspace screening. The excavation depth was limited by the capability of the excavator: the lateral extent was limited on the north and east by proximity to Building 102 and on the south by the underground steam line.

The western extent of the contaminated soil was found approximately 15 feet from the center of the UST location. The southern, northern, and eastern extent of the contaminated soil were not found because of the obstructions noted above.

Groundwater was not encountered within the excavator's limit (14 feet).

The on site facility representative was consulted regarding the steam line to the south of the test pit and the building to the north. While there is no live steam in this line, it would be necessary to cut and cap the line prior to continuing the excavation. Building 102 is currently scheduled for demolition, and the excavation cannot be continued to the north and east while the building is still standing.

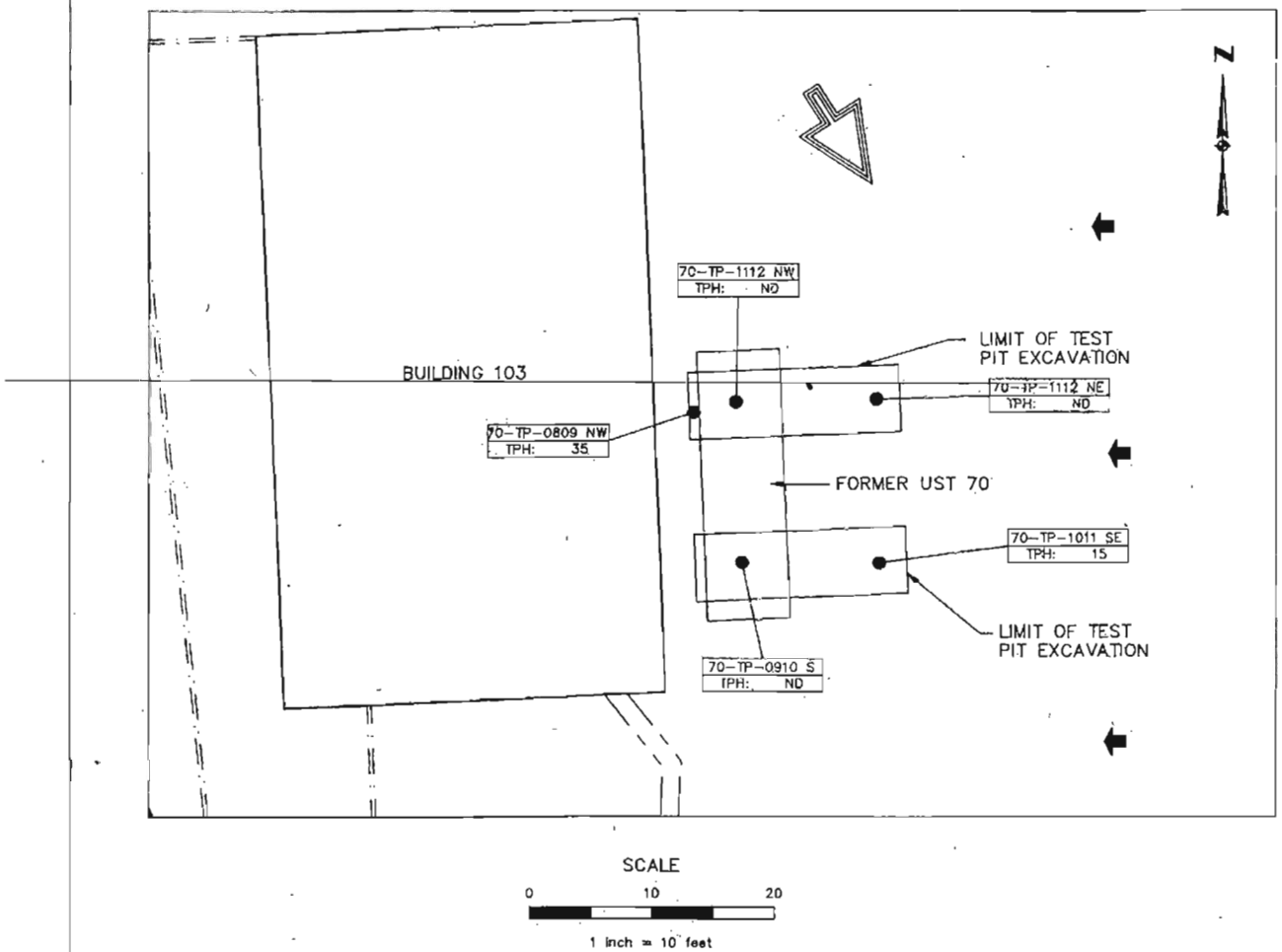
After reaching the limits of the excavation, five discrete samples of the bottom and sides of the excavation were collected for TPH analysis. Analysis of these samples revealed no TPH detected, with one exception. The sample collected from the southeast corner of the excavation at a depth of 10 to 12 feet resulted in a TPH concentration of 2200 mg/kg.

These results indicate the presence of TPH materials at this location. The presence of the volatile organics detected by headspace analysis indicates that the contaminants can be tracked by VOC headspace screening.

UST Location 70:

UST Location 70 is presented on Figure 4-9. This figure shows underground utilities, the former location of the UST, the approximate locations of the test pits in relation to the former UST and Building 103, and a summary of results from samples collected for laboratory analysis.

Two excavations were performed in this area on the east side of Building 103. The first was performed at what was expected to be the southern end of the former UST and the second was performed at what was expected to be the northern end of the former UST. No headspace VOCs were detected in any of the samples collected from either excavation. The tank bedding material was found similar to that at location 69: 1 to 2 feet of a red-brown, very coarse sand and gravel. This was underlain by fine light colored silty sand, which is the natural underlying material in Areas A1 and A2.



LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH —TOTAL PETROLEUM HYDROCARBONS
ND —NONE DETECTED

Sample intervals are expressed in feet below ground surface.
Analytical results for soil are expressed in mg/kg.
Analytical results for groundwater area expressed in mg/l.

—SOIL BORING

—BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992. Location of former UST piping unknown.

FIGURE 4-9
MAP AND ANALYTICAL RESULTS
UST LOCATION 70
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)
SCALE: 1" = 10'	DATE: DECEMBER 1994
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-9.DWG REV: 1

W5294062F

Five discrete soil samples (plus one duplicate sample) were collected from the bottoms and sides of these excavations for TPH analysis to confirm the absence of contaminated soil. Results from these samples indicate only traces of TPH present, at concentrations of 15 and 35 mg/kg.

4.2.3 UST Area B

Five soil borings were installed in UST Area B as described below:

UST Location 56:

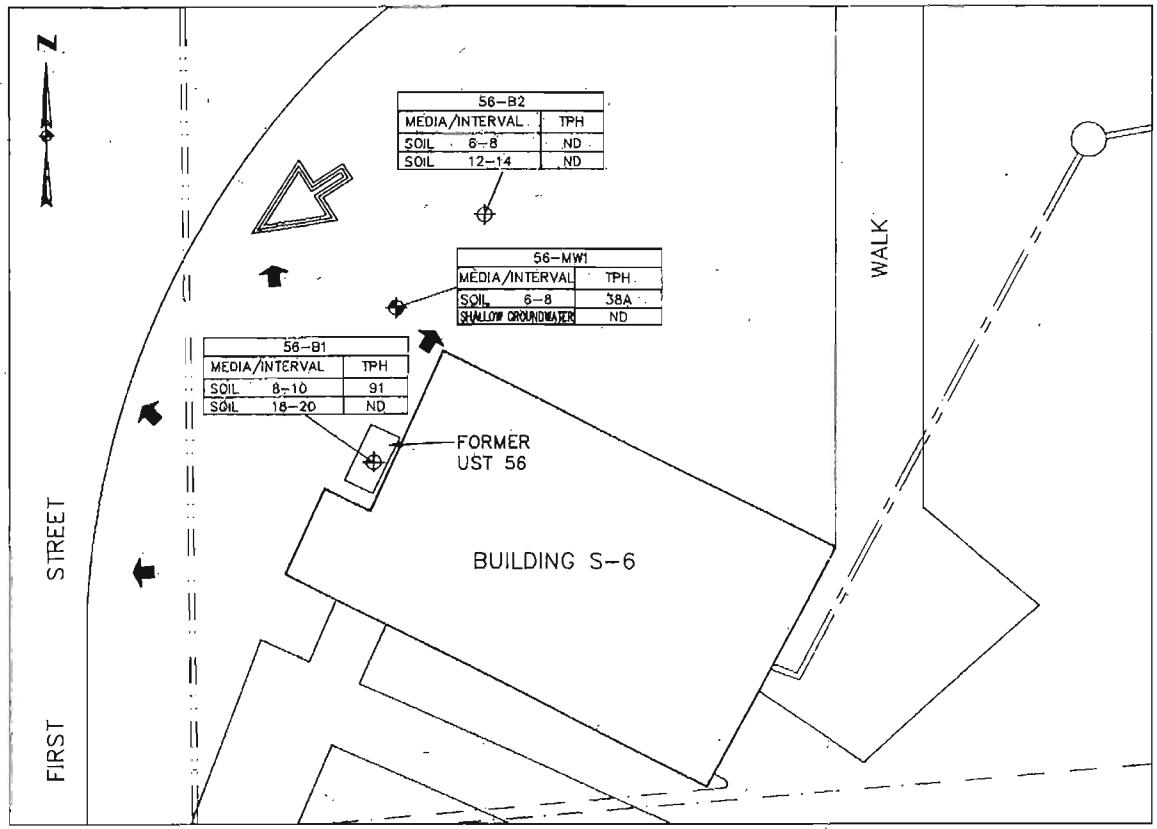
Three soil borings were installed in the vicinity of UST location 56. Soil samples were collected for TPH and headspace screening analysis, as described in Section 3.0. Figure 4-10 presents underground utilities, the UST location, boring locations, and concentrations of TPH found by laboratory analysis.

Continuous samples were collected to a depth of 14 feet in one of these borings, and to a depth of 20 feet in two borings. The boring logs indicate soil in this area consist of fine, light-brown, silty sand to approximately 7 to 8 feet below ground surface. An organic soil layer was detected at approximately 8 feet below ground surface. This organic layer was underlain by grey fine silty sand with trace organic matter which extended to the bottom of the borings.

Groundwater was found at approximately 4 to 5 feet below ground surface. One well was installed as shown on Figure 4-10. Groundwater was collected from this well for TPH analysis.

Headspace screening of samples indicated high VOC content in the soil (maximums over 1000 ppm in B2 and MW1). However, samples selected for laboratory TPH analysis exhibited low concentrations of TPH (maximum of 91 mg/kg at the same depth interval of the highest headspace VOC readings). No TPH was detected in the groundwater sample collected.

These results indicate that a limited volume of contaminated soil is likely present at the UST location, and extending to the north. The presence of the high concentrations of VOCs and low associated concentrations of TPH indicate that the contaminants present could be a result of a recent release at this location.



SCALE

0 20 40

1 Inch = 20 feet

LEGEND

TPH —TOTAL PETROLEUM HYDROCARBONS
ND —NONE DETECTED
A —AVERAGE OF DUPLICATE SAMPLES

Sample Intervals are expressed in feet below ground surface.
Analytical results for soil are expressed in mg/kg.
Analytical results for groundwater area expressed in mg/l.

—MONITORING WELL

—SOIL BORING

—BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992.
Location of former UST piping unknown.

FIGURE 4-10
MAP AND ANALYTICAL RESULTS
UST LOCATION 56
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)
SCALE: 1" = 20'	DATE: DECEMBER 1994
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-10.DWG — REV: 1

W5294052F

UST Location 58

Three soil borings were installed in the vicinity of UST location 58. Soil samples were collected for TPH and headspace screening analysis, as described in Section 3.0. Figure 4-11 presents underground utilities, the UST location, boring locations and concentrations of TPH found by laboratory analysis.

Continuous samples were collected to a depth of 12 feet in one of these borings, to a depth of 14 feet in one boring, and to a depth of 20 feet in the third. The boring logs indicate soil in this area consist of light-brown, fine silty sand to approximately 8 to 10 feet below ground surface, underlain by grey fine silty sand with indications of organic matter to the bottoms of the borings. An organic soil layer was detected at approximately 8 feet below ground surface in one boring.

Groundwater was found at approximately 4 to 5 feet below ground surface. One well was installed as shown on Figure 4-11. Groundwater was collected from this well for TPH analysis.

Headspace screening of samples indicated low VOC content in the soil (maximum concentration detected 58 ppm). This finding was generally supported by samples selected for laboratory TPH analysis, which exhibited low concentrations of TPH. The sample exhibiting the maximum headspace VOC concentration was found to exhibit the maximum TPH concentration (760 mg/kg).

Analysis of the groundwater sample collected from the well at this location showed no TPH detected in the shallow water table.

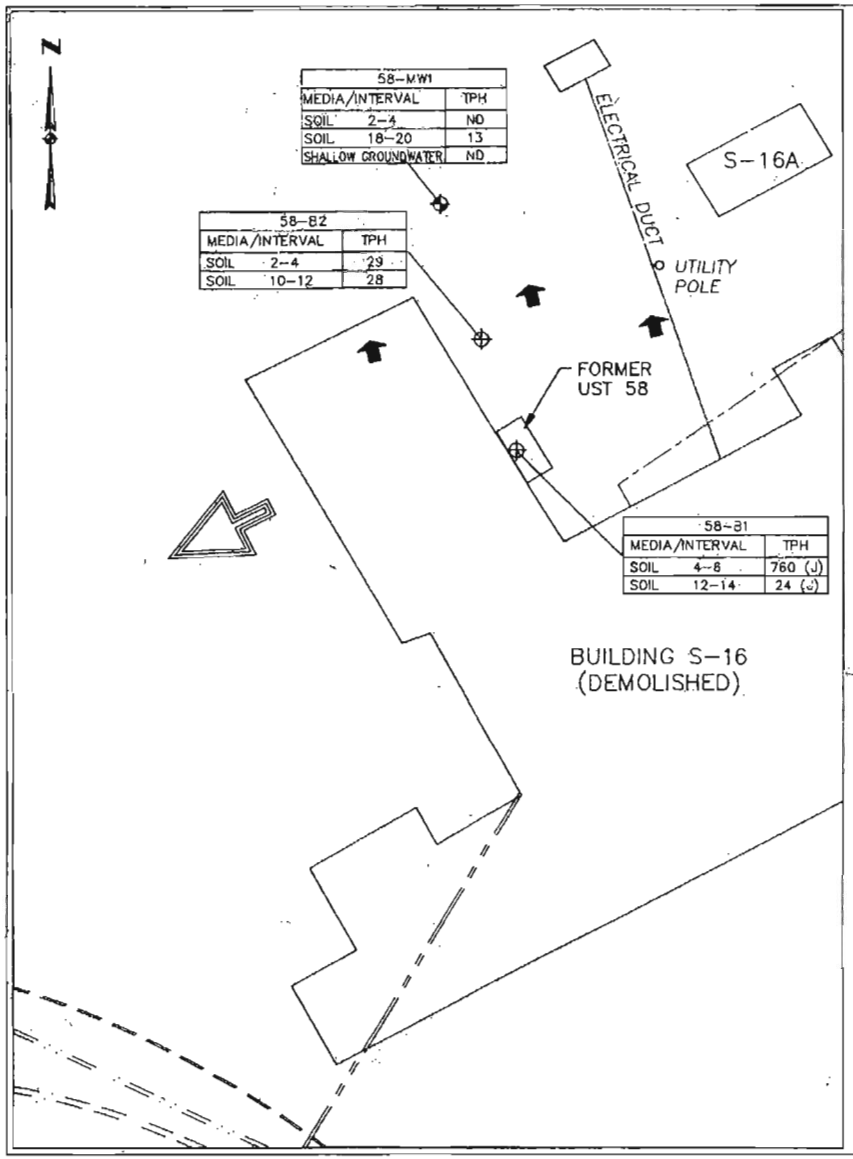
These results indicate that there may be some contaminated soil at the location of the former UST at the top of the water table. However, VOCs were not consistently detectable by headspace screening at this location. The TPH present may be residual from an old release, where most of the volatile organic materials have dissipated.

4.2.4 UST Area D1

Seventeen borings were installed at UST Area D1, as described below.

UST Location 46

Two soil borings were installed in the vicinity of UST Location 46; both borings were completed as groundwater monitoring wells. Soil samples were collected for TPH and headspace screening analysis and groundwater samples were collected for TPH analysis as described in Section 3.0. Figure 4-12



LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH –TOTAL PETROLEUM HYDROCARBONS
ND –NONE DETECTED
J –APPROXIMATE QUANTITATION

Sample intervals are expressed in feet below ground surface.
Analytical results for soil are expressed in mg/kg.
Analytical results for groundwater area expressed in mg/l.

–MONITORING WELL

–SOIL BORING

–BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI: Subsurface Utilities Map revised June, 1992.
Location of former UST piping unknown.

SCALE
0 20 40
1 inch = 20 feet

FIGURE 4-11
MAP AND ANALYTICAL RESULTS
UST LOCATION 58
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)
SCALE: 1" = 20'	DATE: DECEMBER 1994
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-11.DWG — REV: 1

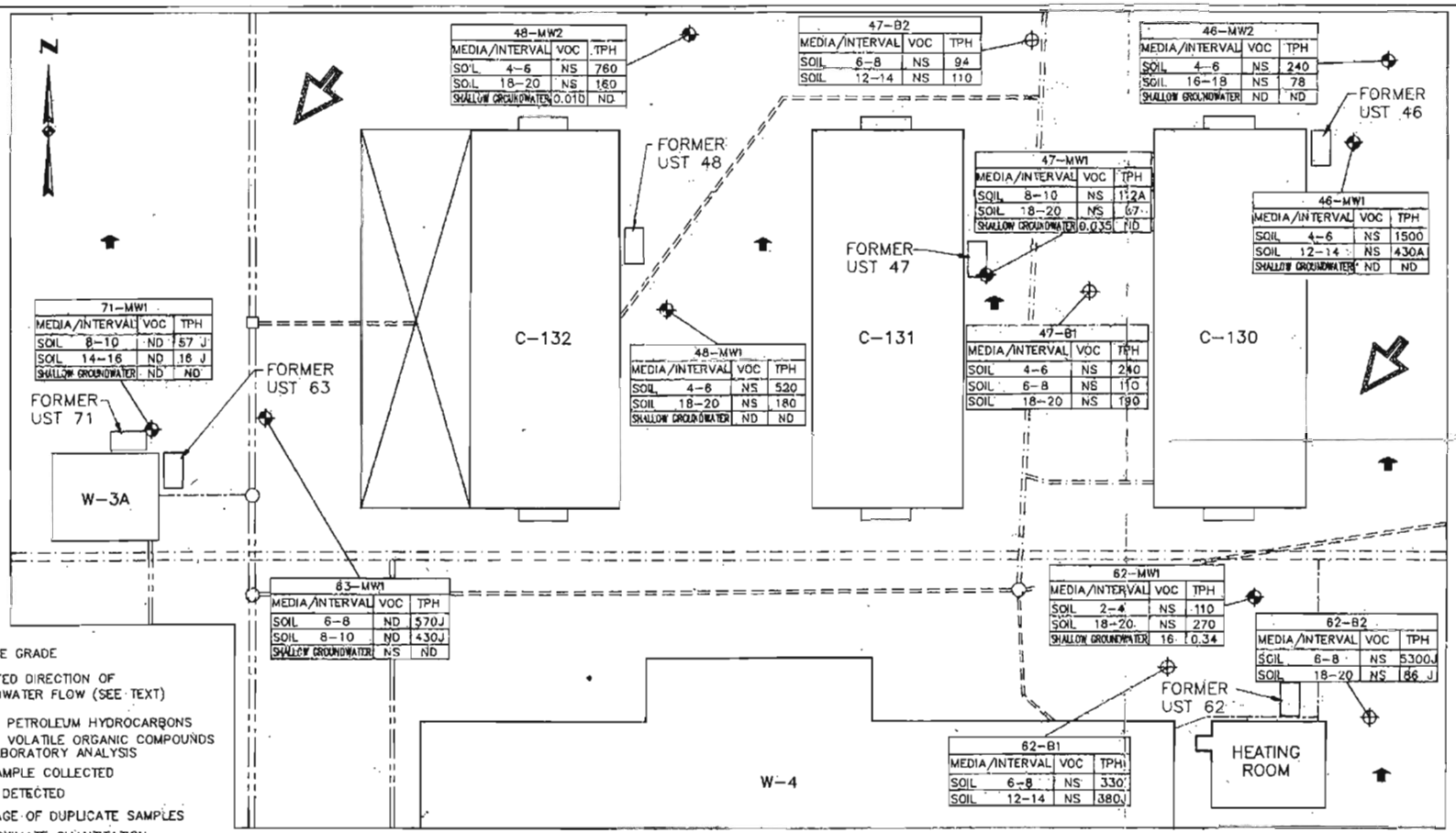


FIGURE 4-12
MAP AND ANALYTICAL RESULTS
UST LOCATION 46,47,48,62,63,& 71
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY		CONTRACT No.: N62472-90-D-1298 (CLEAN)	
SCALE: 1" = 30'		DATE: DECEMBER 1994	
DRAWING No.:		AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-12.DWG	REV: 1

presents underground utilities, the UST location, boring locations, and concentrations of TPH detected by laboratory analysis.

Continuous samples were collected to a depth of 14 feet in one of these borings, and to a depth of 18 feet in the second. The boring logs indicate soil in this area consist of dark brown, poorly graded silty sand. An organic soil layer was found at approximately 5 feet below ground surface. Foreign material was also detected in this area, indicating that the material could be fill to depths below 8 feet.

Headspace screening of samples indicated moderate to high VOC content in the soil. High concentrations of headspace VOCs were detected in boring 46-MW2 (up to 800 ppm), and moderate concentrations of headspace VOCs were detected in boring 46-MW1 (up to 100 ppm). These results were supported by the high concentrations of TPH detected in laboratory samples collected from boring 46-MW1 and the lower concentrations of TPH detected in laboratory samples collected from boring 46-MW2. The maximum concentrations of TPH and headspace VOCs were both found near the top of the water table (approximately 4 feet below ground surface).

Higher concentrations of VOCs are present in the soil to the northeast of the UST location, but higher concentrations of TPH are present close to the UST location. These results could be caused by groundwater flow transporting VOCs to the northeast, and leaving the less volatile hydrocarbons bound to the soil at the UST location. However, groundwater in this area moves to the south-southwest, indicating that there may be two separate sources: a VOC source to the north and an old TPH release at the UST location. Data from analysis of groundwater shows no TPH or VOCs detected in groundwater. This indicates that the VOCs in the soil to the north of the UST location and the TPH at the UST location may be bound in the soil and not dissolved in the shallow water table.

UST Location 47

Three soil borings were installed in the vicinity of UST location 47. Soil samples were collected for TPH and headspace screening analysis, as described in Section 3.0. Figure 4-12 presents underground utilities, the UST location, boring locations, and concentrations of TPH found by laboratory analysis.

Continuous samples were collected to a depth of 20 feet in two of these borings, and to a depth of 16 feet in the third. The boring logs indicate soil in this area consist of dark-brown, poorly graded, silty sand. Organic root matter was found at approximately 5 feet below ground surface. Materials were detected in this area, indicating that the material could be fill to a depth of 8 feet below ground surface.

Groundwater was observed at 4 feet below ground surface. One boring was finished as a groundwater monitoring well, as shown on Figure 4-12. Groundwater was collected from this well for VOC and TPH analysis.

Headspace screening of samples indicated moderate to high VOC content in the soil. High concentrations of headspace VOCs (>1000 ppm) were detected in boring 47-MW1, between 2 and 8 feet below ground surface. However, low concentrations of TPH were found in laboratory samples from the same interval. Concentrations of headspace VOCs decreased as distance increased from the UST location. Maximum headspace VOC concentrations in each boring were found at the top of the water table (approximately 4 feet below ground surface). Concentrations of TPH in laboratory samples did not show a definitive pattern.

Analysis of groundwater samples revealed the presence of low concentrations of ethylbenzene (4 ug/l) and xylenes (31 ug/l) in the shallow water table at MW1, corresponding with the VOC readings detected in soil by headspace analysis. These compounds are typically associated with gasoline or light fuel oils. No TPH was detected in the groundwater sample collected at this location.

These results indicate that there are residual contaminants present in the groundwater and soil at this location.

UST Location 48

Two soil borings were installed in the vicinity of UST Location 48. Soil samples were collected for TPH and headspace screening analysis, as described in Section 3.0. Figure 4-12 presents underground utilities, the UST location, boring locations, and concentrations of TPH detected by laboratory analysis.

Continuous samples were collected to a depth of 14 feet in one of these borings, and to a depth of 18 feet in the second. The boring logs indicate soil in this area consist of dark brown, poorly graded, silty sand. An organic root mat was found at approximately 5 feet below ground surface.

Both borings were finished as groundwater monitoring wells, as shown on Figure 4-12. Groundwater samples were collected from these wells for TPH and VOC analysis.

Headspace screening of samples indicated a high VOC content in the soil. High concentrations of VOCs (maximum of >1000 ppm) were detected in boring 48-MW1, between 4 and 8 feet below ground surface. This finding was supported by moderate concentrations of TPH that were also found in laboratory samples from these intervals (maximum of 760 mg/kg).

No TPH was detected in the groundwater samples collected. No VOCs were detected in the groundwater sample from MW1; however, traces of ethylbenzene and xylene (<5 ug/l) were detected in the groundwater sample from MW2, approximately 60 feet to the northeast of the UST location.

These results could be caused by groundwater flow transporting VOCs to the northeast. However, TRC reports that groundwater in this area moves to the south - southwest, indicating that there may be other sources present.

UST Location 62:

Three soil borings were installed in the vicinity of UST location 62. Soil samples were collected for TPH and headspace screening analysis, as described in Section 3.0. Figure 4-12 presents underground utilities, the UST location, boring locations and concentrations of TPH found by laboratory analysis.

Continuous samples were collected to a depth of 20 feet in two of these borings, and to a depth of 14 feet in the third. The boring logs indicate soil in this area consist of dark-brown, poorly graded, silty sand. Organic root matter was found at approximately 4 feet below ground surface. The organic layer was underlain by grey silty sand.

One boring was finished as a groundwater monitoring well, as shown on Figure 4-12. Groundwater was found approximately 7 feet below ground surface. Groundwater from this well was collected for VOC and TPH analysis.

Headspace screening of samples indicated a high VOC content in the soil from one boring (62-B2), moderate concentrations of VOCs in one boring (MW1), and low concentrations of VOCs in one boring (62-B1). TPH concentrations from laboratory samples were moderate to low, with the exception of the maximum TPH concentration of 5300 mg/kg at the 6 to 8 foot interval at boring 62-B2, which was also the sample exhibiting the maximum headspace VOC concentration. These results are supported by the boring log, which describes the 6 to 10 foot interval as having a visible sheen and strong TPH odors.

Traces of TPH were detected in the groundwater sample collected at this location (0.34 mg/l), and one VOC was detected, chlorobenzene, at a concentration of 16 ug/l.

These results indicate that there is TPH present in the soil at this location, as well as VOCs, which are not conclusively a result of the presence of the former UST.

UST Location 63 and 71:

Two soil borings were installed in the vicinity of UST Locations 63 and 71. Soil samples form both borings were collected for headspace screening analysis, and laboratory analysis of VOCs and TPH.

Figure 4-12 presents underground utilities, the UST locations, boring locations, and concentrations of TPH detected by laboratory analysis.

Continuous samples were collected to a depth of 20 feet in both of these borings. The boring logs indicate soil in this area consist of dark brown or black, poorly graded silty sand with some gravel. Traces of organic matter were detected at approximately 4 feet below ground surface.

Both borings were finished as groundwater monitoring wells as shown on Figure 4-12. Groundwater was detected at approximately 5 feet below ground surface. Groundwater was collected from both wells for TPH analysis and one well (71-MW1) for VOC analysis.

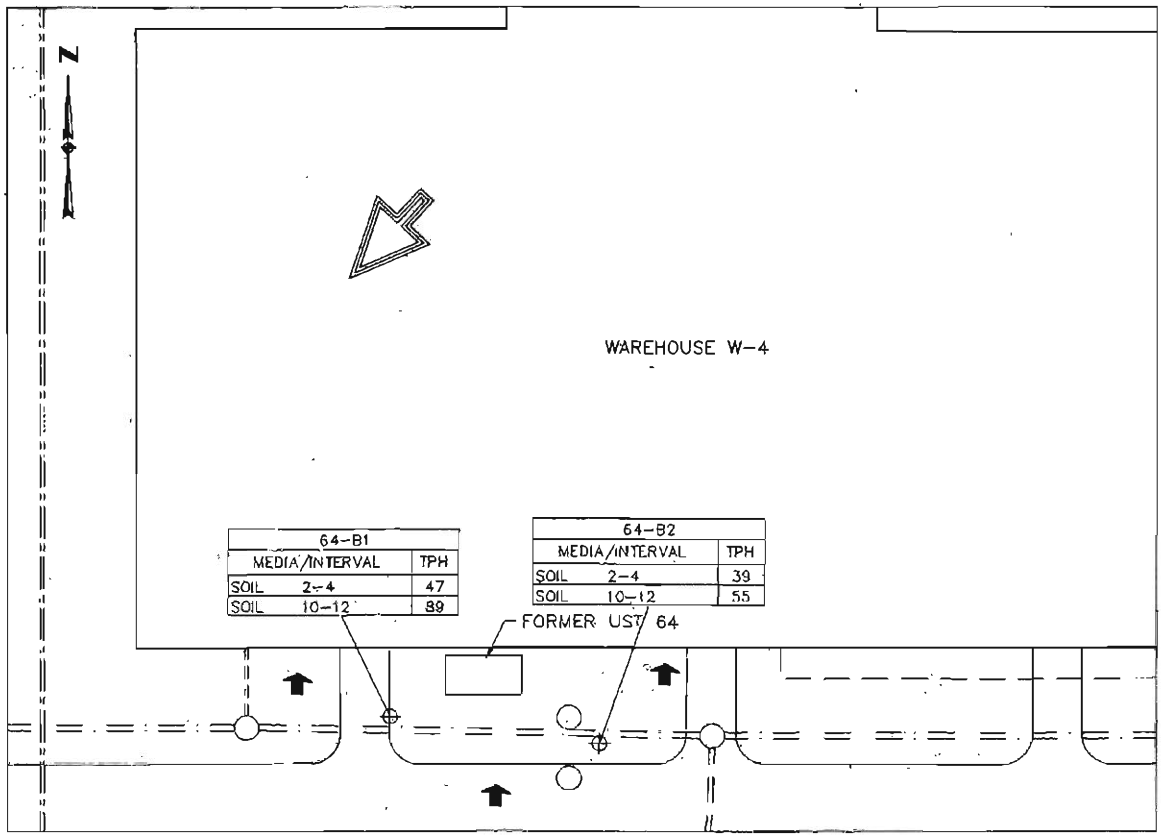
Headspace screening of soil samples indicated a moderate VOC content in the soil (maximum concentrations 100 ppm). Maximum headspace VOC concentrations were detected in boring 71-MW1, between 8 and 10 feet below ground surface, and in boring 63-MW1, between 4 and 8 feet below ground surface. Moderate concentrations of TPH were detected in laboratory samples from boring 63-MW1 (maximum concentration of 570 mg/kg at 6-8 feet below ground surface) and low concentrations of TPH were detected in laboratory samples from boring 71-MW1 (maximum concentration of 57 mg/kg).

TPH and VOCs were not detected in the groundwater samples collected.

These results indicate that a limited volume of contaminated soil may be present immediately east of the former USTs at this location. However, soil contaminated with TPH at this location showed inconsistent headspace screening results, possibly indicating that the TPH present is residue from an old release, where most of the volatile organic materials have dissipated. It could also indicate that the soil are contaminated with other VOCs from another source, to the northeast of the UST location.

UST Location 64:

Two soil borings were installed in the vicinity of UST location 64. Soil samples were collected for TPH and headspace screening analysis as described in Section 3.0. Figure 4-13 presents underground utilities, the UST location, boring locations, and concentrations of TPH detected by laboratory analysis.



64-B1		
MEDIA/INTERVAL		TPH
SOIL	2-4	47
SOIL	10-12	89

64-B2		
MEDIA/INTERVAL		TPH
SOIL	2-4	39
SOIL	10-12	55

SCALE

0 20 40

1 inch = 20 feet

LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH -TOTAL PETROLEUM HYDROCARBONS

All analytical results are expressed in parts per million (ppm).

Sample intervals are expressed in below ground surface.

B# -SOIL BORING

-BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992. Location of former UST piping unknown.

FIGURE 4-13
MAP AND ANALYTICAL RESULTS
UST LOCATION 64
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)	
SCALE: 1" = 20'	DATE: DECEMBER 1994	
DRAWING No.:	AC FILE No.: G:\DWG\DAVIS\94-95FIG\FIG_4-13.DWG	REV: 1

The proximity to live overhead electric lines precluded the use of a full-size drilling apparatus at this location; instead, a powered slide hammer was mounted on a short tripod to collect continuous samples. Typically, this apparatus is effective to 10 feet below ground surface, but without casing, the borehole usually collapses. However, at this location, samples were collected to a depth of 12 feet in both borings before collapse.

The boring logs indicate soil in this area consist of brown, poorly graded, silty sand with some gravel to approximately 3.5 feet below ground surface, then an organic soil layer and tan-grey sand and silty sand to 12 feet.

Groundwater was observed at approximately 2 to 3 feet below ground surface. No wells were installed in this area.

Headspace screening of samples indicated a low VOC content in the soil (maximum concentrations of 60 ppm). This finding was supported by the presence of low concentrations of TPH found in these samples selected for laboratory analysis (maximum concentration of 89 mg/kg).

UST Location 65:

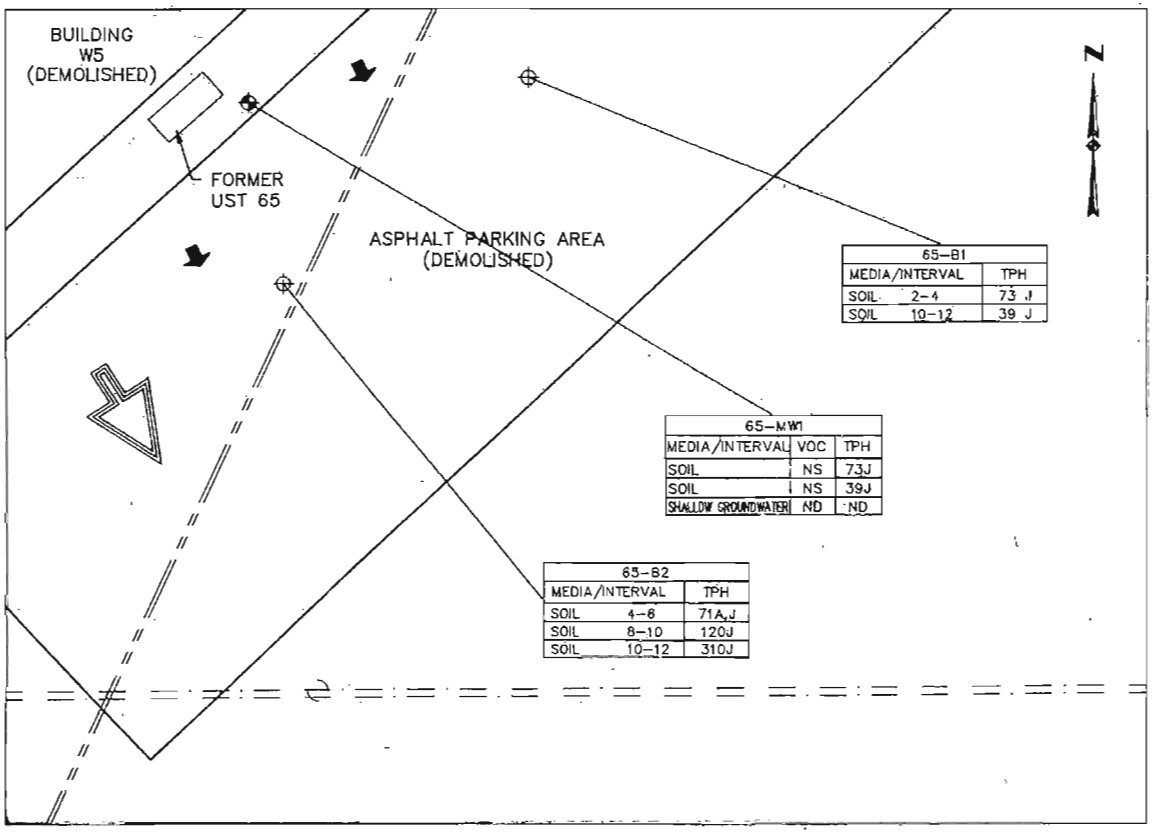
Three soil borings were installed in the vicinity of UST location 65. Soil samples were collected for TPH and headspace screening analysis, as described in Section 3.0. Figure 4-14 presents underground utilities, the UST location, boring locations, and concentrations of TPH found by laboratory analysis.

Continuous samples were collected to a depth of 12 feet in two of these borings, and to a depth of 14 feet in the third. The boring logs indicate soil in this area consist of sand, silty sand with rock and brick fragments, indicating the presence of fill to 10 feet, then natural grey and tan sands below that. No noticeable organic matter was found.

Groundwater was observed at 5 to 6 feet below ground surface. One boring was finished as a groundwater monitoring well, as shown on Figure 4-14. Groundwater was collected from this well for TPH and VOC analysis

Headspace screening of soil samples indicated a low VOC content in the soil (maximum concentration 2 of ppm). TPH concentrations were also low. The maximum concentration detected was 310 mg/kg at boring 65-B2.

TPH and VOCs were not detected in the groundwater samples collected.



SCALE

0 10 20

1 inch = 10 feet

LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

VOC –TOTAL VOLATILE ORGANIC COMPOUNDS DETECTED BY LABORATORY ANALYSIS

TPH –TOTAL PETROLEUM HYDROCARBONS

ND –NONE DETECTED

NS –NO SAMPLE COLLECTED

A –AVERAGE OF DUPLICATE SAMPLES

J –QUANTITATION IS ESTIMATED

Sample intervals are expressed in feet below ground surface.
Analytical results for soil are expected in mg/kg.
Analytical results for groundwater area expressed in mg/l.

–MONITORING WELL

–SOIL BORING

–BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992.
Location of former UST piping unknown.

FIGURE 4-14
MAP AND ANALYTICAL RESULTS
UST LOCATION 65
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)	
SCALE: 1" = 10'	DATE: DECEMBER 1994	
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-14.DWG	REV: 1

4.2.5 UST Area D2

Two borings were installed in UST Area D2, as described below.

UST Location 10:

Two soil borings were installed in the vicinity of UST Location 10. Soil samples were collected for TPH and headspace screening analysis, as described in Section 3.0. Figure 4-15 presents underground utilities, the UST location, boring locations, and concentrations of TPH detected by laboratory analysis.

Continuous samples were collected to a depth of 14 feet in one of these borings, and to a depth of 12 feet in the second. The boring logs indicate that soil in this area consist of brown silty sand to approximately 5 feet below ground surface. There is a change at 5 to 6 feet to coarse sand and gravel with silt to the bottom of the borings.

Groundwater was encountered at approximately 4.5 feet below ground surface. Both borings were finished as groundwater monitoring wells, as shown on Figure 4-15. Groundwater was collected from both of these wells for TPH and VOCs.

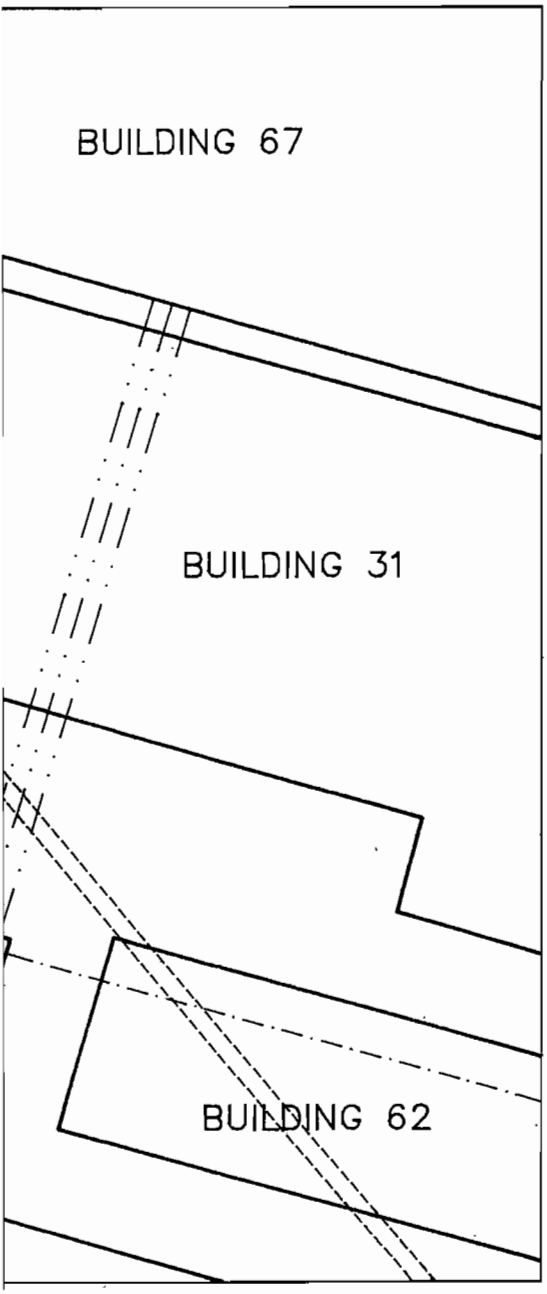
Headspace screening of soil samples indicated moderate VOC content in soil from boring 10-MW1, with the highest concentration (250 ppm) detected at the top of the water table (4 to 6 feet). Low concentrations of headspace VOCs were detected in boring 10-MW2, with a maximum concentration of 10 ppm, detected at a depth of 6 to 8 feet below ground surface. These findings were supported by low concentrations of TPH detected in laboratory samples collected. The maximum concentration of TPH was detected at the 4 to 6 foot interval of MW1 (160 mg/kg).

Low concentrations of TPH (maximum 5.1 mg/l) were detected in groundwater samples collected from both wells, but no VOCs were detected.

These results indicate that low levels of residual contaminants are present in the soil and groundwater at this location, which are likely to be a result of the former UST or other activities in this area.

4.2.6 UST Area E

Three borings were installed at UST Area E as described below.



LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH —TOTAL PETROLEUM HYDROCARBONS
VOC —TOTAL VOLATILE ORGANIC COMPOUNDS BY LABORATORY ANALYSIS
NS —NO SAMPLE COLLECTED
ND —NONE DETECTED

All analytical results are expressed in parts per million (ppm).

Sample intervals are expressed in below ground surface.

MW# —MONITORING WELL

—BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992. Location of former UST piping unknown.

FIGURE 4–15
MAP AND ANALYTICAL RESULTS
UST LOCATION 10
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472–90–D–1298 (CLEAN)	
SCALE: 1" = 20'	DATE: DECEMBER 1994	
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94–95FIG\FIG_4–15.DWG	REV: 0

UST Location 68:

Three soil borings were installed in the vicinity of UST location 68. Soil samples were collected for TPH and headspace screening analysis, as described in Section 3.0. Figure 4-16 presents underground utilities, the UST location, boring locations, and concentrations of TPH found by laboratory analysis.

Continuous samples were collected to a depth of 12 feet in two of these borings, and to a depth of 20 feet in the third. The boring logs indicate soil in this area consist of a light-brown, fine silty sand underlain by grey fine silty sand. No organic layer was detected in these borings.

Groundwater was observed at approximately 4 to 5 feet below ground surface. One well was installed, as shown on Figure 4-16. Groundwater was collected from this well for TPH and VOC analysis.

Headspace screening of samples indicated high VOC content in the soil (maximum concentration detected >1000 ppm). However, samples selected for laboratory analysis exhibited low concentrations of TPH. No contaminants were detected in the groundwater sample collected.

These results indicate that there are residual VOCs in the soil at the top of the groundwater table. However, the TPH results do not indicate a former release from the UST, and the VOCs could be a result of current use of Building E-107 and its southern exterior as a marina storage and maintenance area.

4.2.7 UST Area F1

Thirteen borings were installed in UST Area F1 as described below.

UST Location 25:

Four soil borings were installed in the vicinity of UST location 25. Soil samples were collected for TPH and VOC analysis as well as headspace screening analysis. Figure 4-17 presents underground utilities, the UST location, boring locations, and concentrations of TPH found by laboratory analysis.

Continuous samples were collected to a depth of 12 feet in three of these borings, and to a depth of 30 feet in one boring. The boring logs indicate soil in this area consist of a light-brown and tan fine sands, changing to more coarse sands with gravel and rock fragments below 20 feet. No organic layer was detected in these borings.

LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH	–TOTAL PETROLEUM HYDROCARBONS
VOC	–TOTAL VOLATILE ORGANIC COMPOUNDS BY LABORATORY ANALYSIS
NS	–NO SAMPLE COLLECTED
ND	–NONE DETECTED
A	–AVERAGE OF DUPLICATE SAMPLES

All analytical results are expressed in parts per million (ppm).

Sample intervals are expressed in below ground surface.

MW# –MONITORING WELL

B# –SOIL BORING

–BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992. Location of former UST piping unknown.

SCALE

0 20 40

1 inch = 20 feet

FIGURE 4–16
MAP AND ANALYTICAL RESULTS
UST LOCATION 68
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472–90–D–1298 (CLEAN)	
SCALE: 1" = 20'	DATE: DECEMBER 1994	
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94–95FIG\FIG_4–16.DWG	REV: 0

Groundwater was observed at approximately 20 feet below ground surface. One well was installed, as shown on Figure 4-17. Groundwater from this well was collected for TPH and VOC analysis.

Headspace screening of soil samples indicated low VOC content in the soil (maximum concentration detected of 3.5 ppm). These findings were supported by low concentrations of TPH detected in samples selected for laboratory analysis. The maximum concentration of TPH was detected at the 6 to 8 foot interval of B1 (210 mg/kg).

No TPH or VOCs were detected in the groundwater samples collected.

UST Location 26-28:

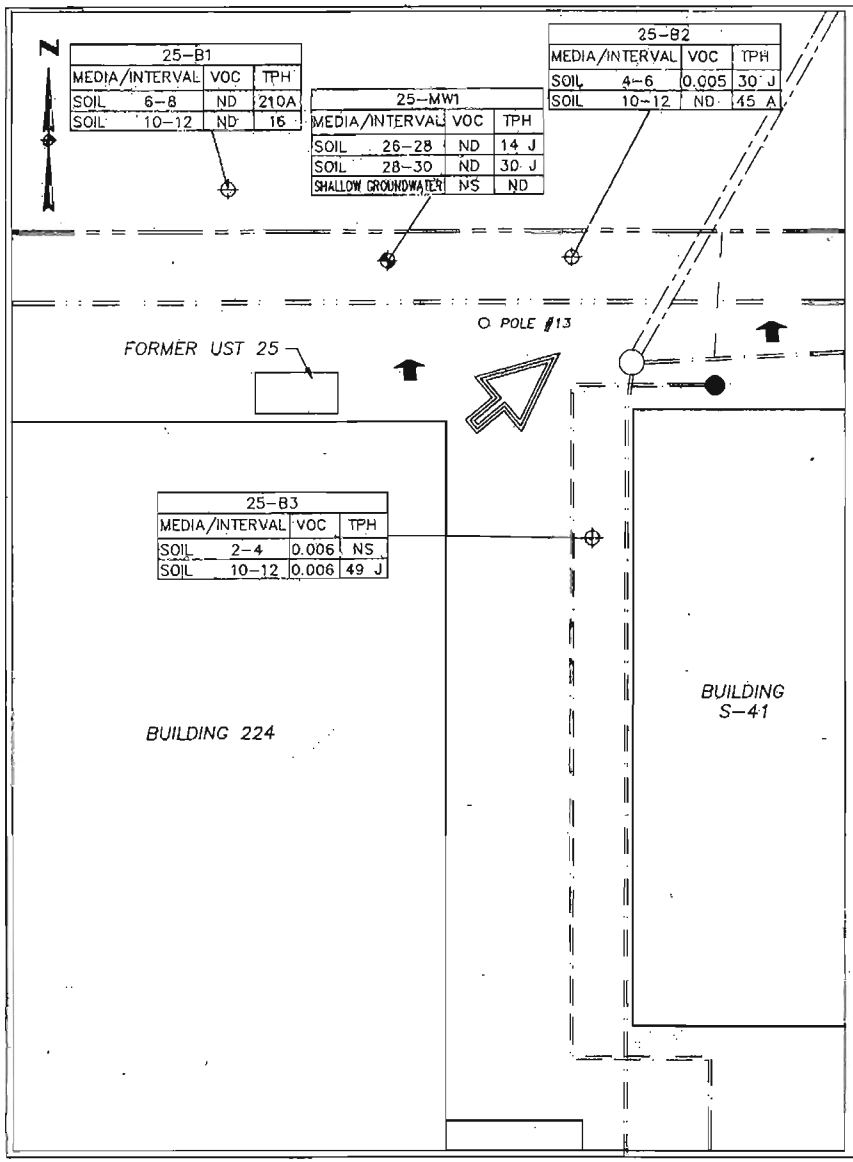
Five soil borings were installed in the vicinity of UST locations 26-28. Soil samples were collected for TPH and VOC analysis as well as headspace screening analysis. Figure 4-18 presents underground utilities, the UST locations, boring locations, and concentrations of TPH detected by laboratory analysis.

Continuous samples were collected to a depth of 12 feet in two of these borings, and to a depth of 30 feet in three. The boring logs indicate that soil in this area consist of grey silty sand changing to brown silty sand with gravel.

Groundwater was encountered at approximately 20 feet below ground surface. Three borings were finished as a groundwater monitoring well as shown on Figure 4-18. Groundwater was collected from all wells for TPH and VOC analysis.

Headspace screening of soil samples indicated low VOC content in the soil (maximum concentration detected 2 ppm). These findings were supported by low concentrations of TPH, and only trace concentrations of VOCs detected in soil samples collected for laboratory analysis. Maximum TPH sample result was 360 mg/kg 2 to 4 feet below ground surface at 26-MW3 (furthest boring from the UST location).

Traces of TPH (<1 mg/l) were detected in one groundwater sample, collected from MW1, which was installed in the UST location. In addition, traces of trichloroethene (TCE) were detected in all the wells installed at this location. TCE is an industrial solvent typically used as a degreaser or cleaning solvent. It is believed that this material originated from a nearby solvent disposal site, not the former USTs. This issue is discussed in more detail in Section 5.0 of this report.



25-B1		
MEDIA/INTERVAL	VOC	TPH
SOIL 6-8	ND	210A
SOIL 10-12	ND	16

25-MW1		
MEDIA/INTERVAL	VOC	TPH
SOIL 26-28	ND	14 J
SOIL 28-30	ND	30 J
SHALLOW GROUNDWATER	NS	ND

25-B2		
MEDIA/INTERVAL	VOC	TPH
SOIL 4-6	0.005	30 J
SOIL 10-12	ND	45 A

25-B3		
MEDIA/INTERVAL	VOC	TPH
SOIL 2-4	0.006	NS
SOIL 10-12	0.006	49 J

SCALE

0 20 40

1 inch = 20 feet

LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH –TOTAL PETROLEUM HYDROCARBONS
VOC –TOTAL VOLATILE ORGANIC COMPOUNDS BY LABORATORY ANALYSIS
NS –NO SAMPLE COLLECTED
ND –NONE DETECTED
A –AVERAGE OF DUPLICATE SAMPLES
J –APPROXIMATE QUANTITATION

All analytical results are expressed in parts per million (ppm).

Sample intervals are expressed in below ground surface.

MW# –MONITORING WELL

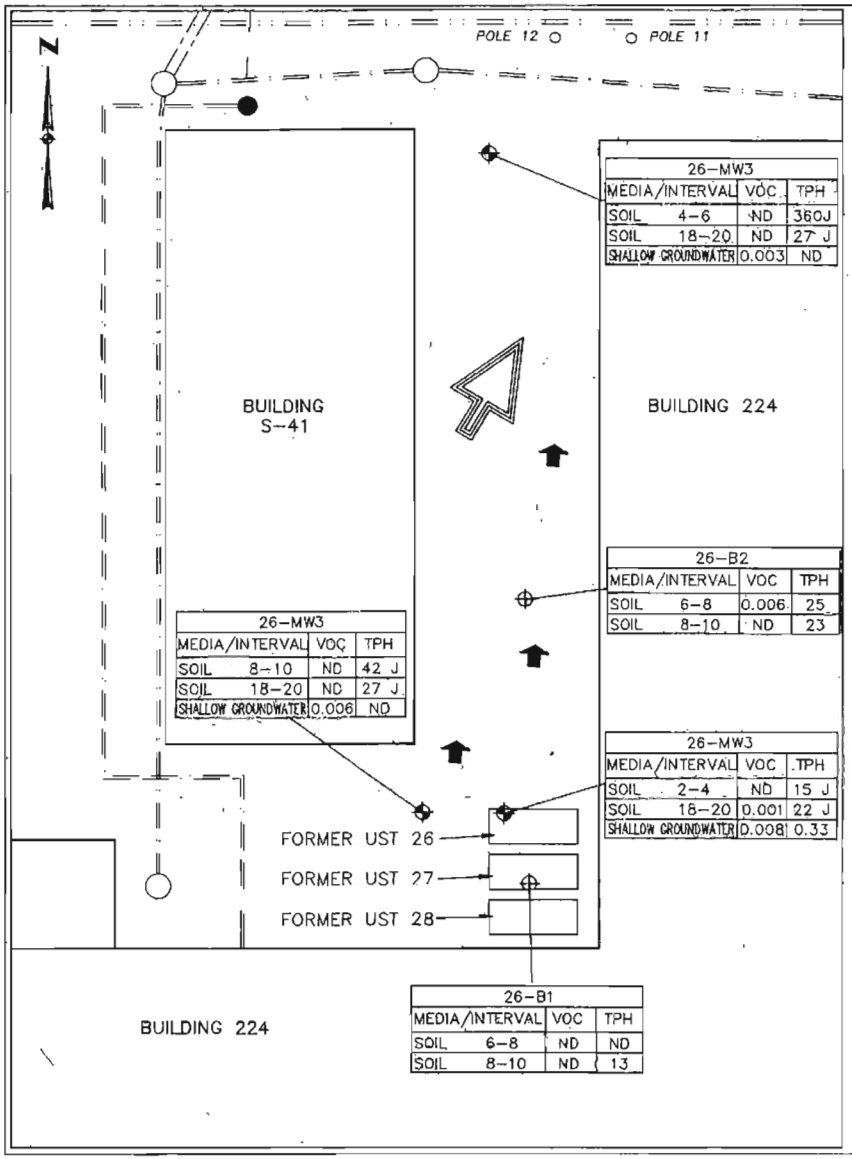
B# –SOIL BORING

–BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992. Location of former UST piping unknown.

FIGURE 4-17
MAP AND ANALYTICAL RESULTS
UST LOCATION 25
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)	
SCALE: 1" = 20'	DATE: DECEMBER 1994	
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-17.DWG	REV: 1



SCALE

0 20 40

1 inch = 20 feet

LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH –TOTAL PETROLEUM HYDROCARBONS
VOC –TOTAL VOLATILE ORGANIC COMPOUNDS BY LABORATORY ANALYSIS
NS –NO SAMPLE COLLECTED
ND –NONE DETECTED
J –APPROXIMATE QUANTITATION

All analytical results are expressed in parts per million (ppm).

Sample intervals are expressed in below ground surface.

MW# –MONITORING WELL

B# –SOIL BORING

–BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992. Location of former UST piping unknown.

FIGURE 4-18
MAP AND ANALYTICAL RESULTS
UST LOCATION 26-28
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)	
SCALE: 1" = 20'	DATE: DECEMBER 1994	
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-18.DWG	REV: 1

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UST Location 66:

Two soil borings were installed in the vicinity of UST Location 66. Soil samples were collected for TPH and VOC analysis as well as headspace screening analysis. Figure 4-19 presents underground utilities, the UST location, boring locations, and concentrations of TPH detected by laboratory analysis.

Continuous samples were collected to a depth of 14 feet in one boring, and to a depth of 22 feet in the second. The boring logs indicate that soil in this area consist of grey silty sand changing to tan silty sand with gravel.

Groundwater was encountered at approximately 20 feet below ground surface. One boring was finished as a groundwater monitoring well, as shown on Figure 4-19. Groundwater from this well was collected for VOC and TPH analysis.

Headspace screening of soil samples indicated low VOC content in the soil (maximum concentration detected 30 ppm). These findings were partially supported by low concentrations of TPH detected by laboratory analysis of deep samples collected. Shallow samples collected for laboratory analysis (2 to 4 feet below ground surface) had high concentrations of TPH (780 mg/kg in 66-MW1 and 1300 mg/kg in 66-B1), and trace concentrations of 2-butanone (methylethyl ketone).

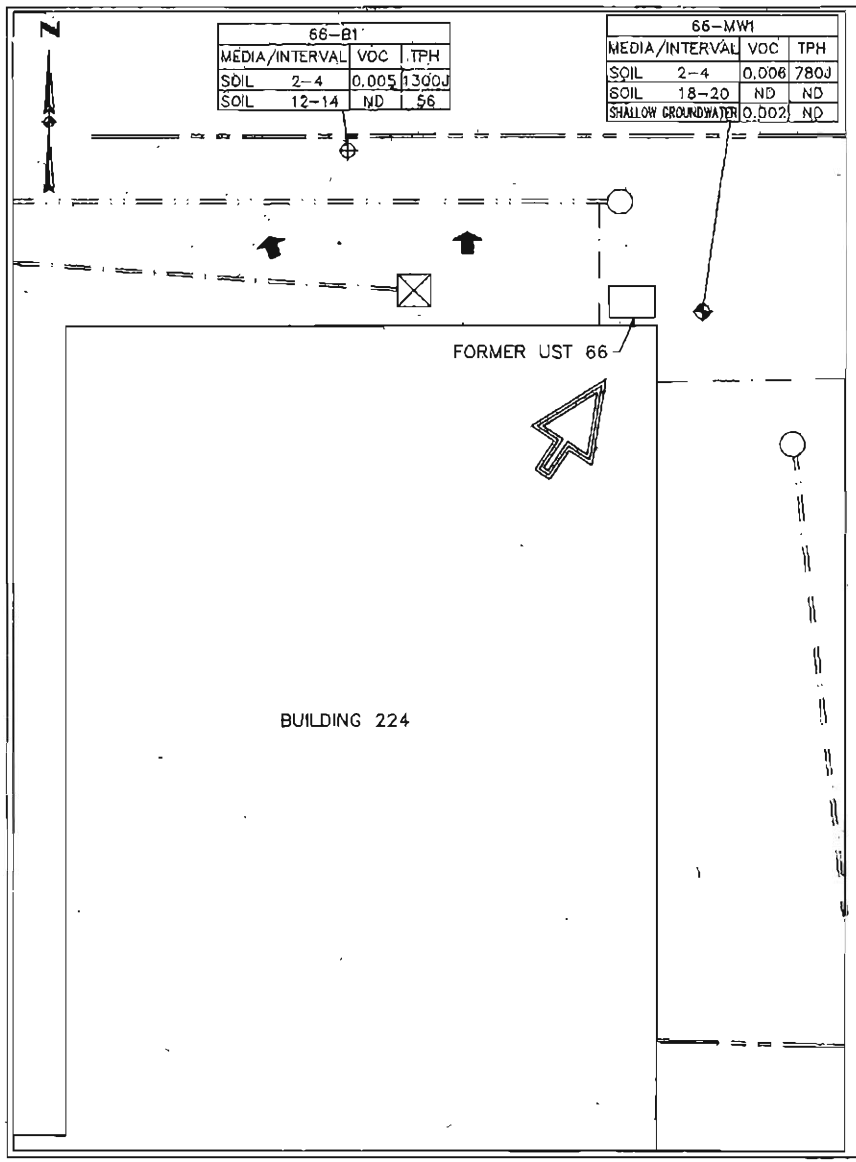
No TPH was detected in the groundwater sample collected. However, traces of TCE were detected. TCE is an industrial solvent typically used as a degreaser or cleaning solvent. It is expected that this material originated at a source other than the former UST.

The TPH results indicate a surficial release may have occurred in the area of this location, which is 25 feet north of the east wing of Building 224. Building 224 is a former vehicle maintenance facility for the base. The contaminants' spatial location indicates that a release from the UST is unlikely.

UST Location 37-40:

Two soil borings were installed in the vicinity of UST location 37-40. Soil samples were collected for TPH and headspace screening, as described in Section 3.0. Figure 4-20 presents underground utilities, the UST locations, boring locations, and concentrations of TPH detected by laboratory analysis.

Continuous samples were collected to a depth of 12 feet in both of these borings. The boring logs indicate that soil in this area consist of grey silty sand changing to tan silty sand with gravel.



66-B1			
MEDIA/INTERVAL		VOC	TPH
SOIL	2-4	0.005	1300J
SOIL	12-14	ND	56

66-MW1			
MEDIA/INTERVAL		VOC	TPH
SOIL	2-4	0.006	780J
SOIL	18-20	ND	ND
SHALLOW GROUNDWATER		0.002	ND

SCALE

0 20 40

1 inch = 20 feet

LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH -TOTAL PETROLEUM HYDROCARBONS

VOC -TOTAL VOLATILE ORGANIC COMPOUNDS BY LABORATORY ANALYSIS

NS -NO SAMPLE COLLECTED

ND -NONE DETECTED

J -APPROXIMATE QUANTITATION

All analytical results are expressed in parts per million (ppm).

Sample intervals are expressed in below ground surface.

MW# -MONITORING WELL

B# -SOIL BORING

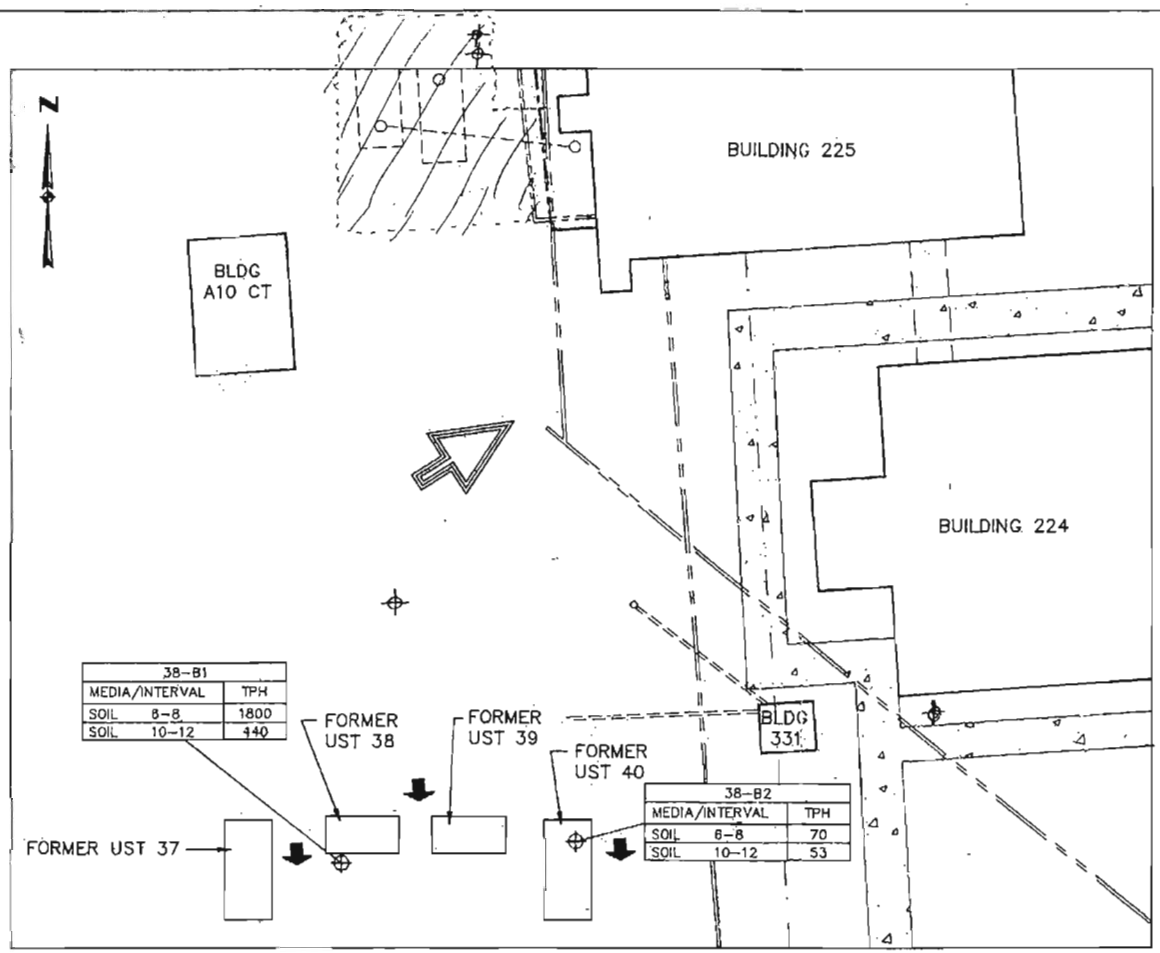
-BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from U.S. Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992. Location of former UST piping unknown.

FIGURE 4-19
MAP AND ANALYTICAL RESULTS
UST LOCATION 66
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)	
SCALE: 1" = 20'	DATE: DECEMBER 1994	
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-19.DWG	REV: 1

W5294052F



SCALE

0 20 40

1 Inch = 20 feet

LEGEND

SURFACE GRADE

ESTIMATED DIRECTION OF GROUNDWATER FLOW (SEE TEXT)

TPH -TOTAL PETROLEUM HYDROCARBONS
BGS -BELOW GROUND SURFACE

All analytical results are expressed in parts per million (ppm).
Sample intervals are expressed in below ground surface.

B# -SOIL BORING

-BROKEN LINES INDICATE UNDERGROUND UTILITIES

Redrawn from US Naval Advance Base Depot, Davisville, RI. Subsurface Utilities Map revised June, 1992. Location of former UST piping unknown.

FIGURE 4-20
MAP AND ANALYTICAL RESULTS
UST LOCATION 37-40
FORMER NCBC DAVISVILLE, RI

CLIENT: U.S. NAVY	CONTRACT No.: N62472-90-D-1298 (CLEAN)	
SCALE: 1" = 20'	DATE: DECEMBER 1994	
DRAWING No.:	AC FILE No.: C:\DWG\DAVIS\94-95FIG\FIG_4-20.DWG	REV: 1

Groundwater was not encountered at this location. Information from nearby wells indicates that the water table is approximately 20 feet below ground surface.

Headspace screening of soil samples indicated low VOC content in the soil (maximum concentration detected of 0.5 ppm). However, laboratory analysis indicated moderate to high TPH concentrations. A maximum of 1800 ppm TPH was detected in B1 at 6 to 8 feet below ground surface. A concentration of 440 ppm was detected in the 10 to 12 foot interval from the same boring. TPH concentrations from the two samples collected from boring 66-B2 were both below 100 mg/kg.

These results indicate that there is a limited volume of TPH - contaminated soil at this UST location.

4.3 PREVIOUS INVESTIGATIONS

Two previous sampling programs were conducted prior to the investigation described in this report. The first was conducted by O'Brien and Gere Engineers, Inc. (O&G) in 1990, prior to UST removal. The second was conducted by Franklin Environmental Services Inc. (FES) during the UST removal actions in May and June, 1992. These investigations are described in detail in the UST Investigation Summary Report, prepared by HNUS in June 1993.

The 1993 HNUS summary report indicated that there were conflicting records between the two reports prepared by O&G and FES. The closure summary written by FES did not provide descriptions of sample collection points, and there was some speculation that sample results reported were those from excavated soil rather than from within the excavation. The summary report concluded that some UST locations still were likely to have contaminants present and recommended further investigations at those locations.

The UST Remedial Investigation described herein was initiated in June 1994. Results from these investigations are presented in this report. It was again found that the analytical data from each study did not produce results that were directly comparable with one-another. This is due to three factors, including limitations of the sampling strategy, limitations of the analytical methods, and the possibility that previous data were incorrectly reported.

Soil sample collection and analysis produces analytical results that can vary due to the soil composition, physical characteristics, and the chemical degradation of the target contaminants. Many times soil samples collected from the same location are found to have remarkably different chemical analytical results, due to differences in pore size, grain size, degree of saturation, etc., of each sample.

A limitation of the analytical methods is also a potential reason for the report difference. Headspace VOCs are measured in an uncontrolled environment, and results can increase with ambient temperature and humidity. Interference can also result from soil gas and methane naturally present in some soil. Interference in TPH samples can result from water turbidity (aqueous samples) and small grain size (soil samples).

The sample strategy of the FES sample collection effort was reportedly to collect a soil sample from material directly under the UST after it was removed. Therefore, FES samplers had the target material exposed for direct sampling. The sample collection approach used by O&G and HNUS cannot target sample locations in the same manner as the approach used by FES.

5.0 POTENTIAL RECEPTORS

This section presents descriptions of each UST Area. These descriptions include distances to potential human and ecological receptors, groundwater classifications, and other potential source areas. This information is presented to provide a perspective on the need for corrective action and timeliness of that action.

Figure 5-1 presents an overview of the UST areas that are under investigation (see map pocket at end of text). It also presents the locations of nearby CERCLA sites currently under investigation or remediation. Other CERCLA sites on the base that are not near these UST areas are not presented on this figure.

5.1 UST AREAS A1 AND A2

UST Areas A1 and A2 are located on the western-most section of the main base, near the Route 1 entrance to the NCBC. UST Area A1 includes the NCBC facilities main office and the support buildings immediately surrounding it. UST Area A2 includes the former barracks to the north of Area A1. The buildings in UST Area A1 are industrial and future use is expected to be commercial/industrial. The buildings in UST Area A2 were used to house Navy personnel and future use could be residential. To the south, on Callahan Road, is former Navy property which is also industrial. Non-military residential property exists 400 feet north, and upgradient of UST Area A2. Commercial properties along with Route 1 lie to the west (cross-gradient of these UST areas).

As indicated in Section 4.0 of this report, groundwater flow in this area is expected to be to the east and south. If the contaminants in the soil were mobilized by the groundwater, they would move south, across Davisville Road, to the industrial areas. Petroleum contaminants would likely remain in the upper portion of the aquifer, rather than migrating into the deep overburden.

5.2 UST AREA B

UST Area B is located to the south of the main base. Buildings in this area were Navy support buildings, and are currently being demolished or renovated. Surficial grade in this area is generally flat, pitching slightly to the south and west.

A series of Navy industrial buildings are located north of UST Area B; further to the north (2000 feet) are residential properties and wetland areas. To the south and west are industrial properties that were once part of the Quonset Point Naval Air Station. To the east is empty warehouse space that was developed for and by the NCBC.

Future use of this space is likely to be additional industrial space that would be a part of the industrial park to the south, which is operated by the Rhode Island Port Authority.

As indicated in Section 4.0 of this report, groundwater flow in this area is expected to be to the west - southwest. If the contaminants in the soil were mobilized by the groundwater, they would move to the industrial areas. Petroleum contaminants would likely remain in the upper portion of the aquifer, rather than migrating into the deep overburden.

5.3 UST Area D1

UST Area D1 is located on the south - central section of the main base in the former warehouse area. The buildings in this area are empty warehouses in various stages of disrepair. The surficial grade is generally level, pitching slightly from the south to the north.

The facility management office reports that some of these warehouses are among the first of the "Quonset Hut" style building developed and constructed during the early 1940s, and will be placed on the national historic register. Therefore, the area will remain as it is. Use of this property could be commercial or light industrial. Residential use of this property is unlikely.

Immediately to the north is vacant Navy property, known as "Solvent Disposal Area Northwest" (Site 13). As indicated on Figure 5-1 a segment of this disposal area is within UST Area D1. Site 13 is under investigation as a CERCLA site, regulated by the USEPA. Site 13 is approximately 6 acres and consists of a large grassy field bounded on three sides by paved roads. Between 1945 and 1955, the Construction and Equipment Department was located in the buildings in this area. Overhaul and repair activities were conducted in these buildings, vehicles were stored in fields to the north and west, and drums of oils, thinners, and solvents were stored adjacent to the buildings. Approximately 300 gallons of waste oils per month were reportedly spread on the fields northwest of the three buildings (TRC, June 1994).

Further to the north (2000 feet) are Navy industrial buildings that are currently unused. To the south and west are industrial properties that were once part of the Quonset Point Naval Air Station. To the east is empty warehouse space and storage yards which was developed for and by the NCBC, and

most recently used as an equipment transfer and auction station. This space is empty. To the west is UST Area B, described in Subsection 5.2.

As indicated in Section 4.0 of this report, groundwater flow in this area is expected to be to the southwest. If the contaminants in the soil were mobilized by the groundwater, they would move through the warehouse areas to the industrial areas. Petroleum contaminants would likely remain in the upper portion of the aquifer, rather than migrating into the deep overburden.

5.4 UST AREA D2

UST Area D2 is located in the south - central section of the main base, northeast of UST Area D. Surficial grade at this location is flat, with no perceptible pitch.

Immediately to the north-east is vacant Navy property, known as "Solvent Disposal Area" (Site 06). Site 06 is under investigation as a CERCLA site, regulated by the USEPA. Site 06 is a flat grassy area northeast of Building 67 approximately one-quarter acre in size. This site was reportedly used from 1970 to 1972 for the disposal of waste chlorinated hydrocarbon solvents. Personnel from the Refrigeration Mechanics Section of the Public Works Department reportedly drained over a dozen 5-gallon containers various liquid wastes in this area, approximately once every three weeks, for an estimated total disposal volume of 1750 gallons (TRC, June 1994).

To the northwest (2000 feet) are non-military residential properties. To the south and west is UST Area D1, described in the previous section. To the east are industrial properties that were once part of the Quonset Point Naval Air Station and Davol Pond.

Future use of this property could be commercial or light industrial. Residential use of this property is unlikely.

As indicated in Section 4.0 of this report, groundwater flow in this area is expected to be to the north-northeast. If the contaminants in the soil were mobilized by the groundwater, they would move through the warehouse areas to the industrial areas and Davol Pond. Petroleum contaminants would likely remain in the upper portions of the aquifer, rather than migrating into the deep overburden.

5.5 UST AREA E

UST Area E is located on the eastern-most section of the main base, at Allen Harbor. This area is a former warehouse and marine storage area and is currently used as a private yacht club. Surficial grade in this area is to the north and east, toward the Allen Harbor shoreline.

To the east and north of UST Area E is Allen Harbor and associated coastal wetlands. To the west (upgradient) is Navy property, including vacant wooded areas, and UST Area F1, described in Section 5.6. To the south are large empty freight yards constructed by the NCBC.

As indicated in Section 4.0 of this report, general groundwater flow in this area is expected to be to the west-southwest. However, the water in the very shallow overburden will more likely follow the ground contour, which slopes to the south, then to the east and the shore of Allen Harbor. If the contaminants in the surface soil were mobilized by the groundwater, they would most likely move towards the harbor. Petroleum contaminants would likely remain in the upper portions of the aquifer.

5.6 UST AREA F1

UST Area F1 is located on the north - central section of the main base, around Building 224. The principal activity in this area was formerly vehicle maintenance. The surficial grade is generally level, but the building sits on a high point. There is a slight pitch away from the building in all directions.

The area surrounding Building 224, and comprising UST Area F1, is the "CED Battery Acid Disposal Area" (Site 02). Immediately surrounding the building (for at least 1000 feet in every direction) is vacant Navy property. To the north are wet areas, known to contain a leaching system from a truck washout. Wooded areas lie to the east and south. To the west is an empty parcel with little vegetation, known as "CED Solvent Disposal Area" (Site 03). Figure 5-1 depicts the locations of these sites. These disposal areas are under investigation as separate CERCLA sites, regulated by the USEPA.

The CED Battery Acid Disposal Area (Site 02) is a flat paved area bounded on all sides by the roads which surround Building 224. From approximately 1955 to 1980, battery acids (primarily dilute sulfuric acid) were poured into a drain at the southwest corner of Building 224, that discharged to a nearby leaching field. The total discharge is expected to have been approximately 18,000 gallons (TRC June 1994).

The CED Solvent Disposal Area (Site 04) is an unmarked portion of a large, vacant, previously paved, level lot to the west of Building 224. Several areas of deteriorated asphalt are visible, interspersed with grass. The size of the lot is approximately 500 by 1000 feet. The groundwater at this site has been classified by RIDEM as class GB, which is designated not suitable for public or private drinking water use without appropriate treatment. Between 1955 and the late 1970s, solvents were disposed of on the ground in this area. Estimates indicate that approximately 3000 gallons of solvents were disposed of at a rate of 10 gallons per month (TRC, June 1994).

Further to the west, on the other side of the CED Solvent Disposal Area (4000 feet) are non- military residential properties. A large wetland areas lies one quarter mile to the north.

High concentrations of petroleum hydrocarbons were found in the surface soil to the north of building 224. Since these contaminants are under asphalt, they are not likely to become mobilized. High concentrations of petroleum hydrocarbons were also found at former UST locations to the south of Building 224, at depths of 8 to 12 feet below ground surface (refer to Figure 3-20).

As indicated in Section 4.0 of this report, groundwater flow in this area is expected to be to the north and northeast. If the contaminants in the soil were mobilized by the groundwater, they would move through UST Area F1 and toward the wetlands and Allen Harbor, to the north. Petroleum contaminants would likely remain on the surface of the groundwater, rather than migrating into the deep overburden.

6.0 CONCLUSIONS AND RECOMMENDATIONS

This section presents a summary of the findings of this investigation, makes recommendations both on the need for corrective action at each UST site and for further investigations that may be required to complete of the corrective action design.

The recommendations in the following subsections are based on TPH concentrations detected during sample collection described in this report. The RIDEM established an action level of 300 mg/kg TPH in soil. In general, TPH concentrations in soil samples exceeding this action level are considered "high" and the associated UST locations are recommended for additional investigations and/or corrective actions.

The VOC content of the soil and groundwater (as detected by laboratory analysis) was also evaluated with respect to RIDEM action levels, or Maximum Contaminant Levels (MCLs). In all cases, the VOCs detected in the laboratory samples collected under this program were called below these action levels.

6.1 UST AREA A1

Seven UST locations were investigated at UST Area A1. The findings of these investigations are summarized in this subsection.

6.1.1 UST Location 3

NFA

Low concentrations of VOCs and TPH were detected in all soil samples collected at UST location 3. No TPH was detected in the groundwater at this location.

Contaminants were not detected at concentrations that present a threat of contaminant transfer to the shallow groundwater. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial.

Due to the current and future land use expected for these areas, the low concentrations of contaminants present, and the indications that contaminants present are not interacting with the groundwater in this area, no further actions are recommended for this UST location.

6.1.2 UST Location 5

High concentrations of TPH were found between 4 and 10 feet below ground surface at UST location 5. However, this contamination appears to be localized. The TPH is likely to be a result of an underground release from the UST system in this area. The FID showed low concentrations of VOCs present in the contaminated zones, indicating that the contamination the result of an old release.

The shallow groundwater in this area is the only potential receptor of concern. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial.

Building 45 was constructed around the UST location, and no corrective action can take place until it is removed.

No corrective action is recommended until the fate of Building 45 is determined. However, a groundwater monitoring program should be initiated and continued until such a determination is made. The recommended groundwater monitoring program is described in Section 7.0 of this report.

6.1.3 UST Location 6

High concentrations of TPH were detected between 4 and 6 feet below ground surface at UST location 6. The presence of these contaminants could either be a result of an overflow in this area or a piping leak. The FID showed no VOCs present in the contaminated zones, indicating that the TPH concentrations are the result of an old release.

The shallow groundwater in this area is the only potential receptor of concern. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial.

This area is recommended for corrective action to eliminate what is expected to be a small source area. Corrective actions are described in Section 7.0 of this report.

6.1.4 UST Location 7

High concentrations of TPH found between 8 and 10 feet below ground surface at UST location 7 are likely a result of an underground release from the UST system in this area. The FID showed low

concentrations of VOCs present in the contaminated zones, indicating that the TPH concentrations are the result of an old release.

The shallow groundwater in this area is the only potential receptor of concern. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial.

This area is recommended for corrective action to eliminate what is expected to be a small source area. Corrective actions are described in Section 7.0 of this report.

6.1.5 UST Location 8

No VOCs and low concentrations of TPH were detected in soil samples collected at UST location 8.

Contaminants were not detected at concentrations that present a threat of contaminant transfer to the shallow groundwater. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial.

Due to the current and future land use expected for these areas, the low concentrations of contaminants present, and the indications that contaminants present are not interacting with the groundwater in this area, no further actions are recommended for this UST location.

6.1.6 UST Location 9

Low concentrations of VOCs and TPH were detected in all soil samples collected at UST location 9.

Contaminants were not detected at concentrations that present a threat of contaminant transfer to the shallow groundwater. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial.

Due to the current and future land use expected for these areas, the low concentrations of contaminants present, and the indications that contaminants present are not interacting with the groundwater in this area, no further actions are recommended for this UST location.

6.1.7 UST Location 11-22

High concentrations of VOCs and TPH in the area of USTs 11-22 are most likely a result of underground releases from the former fuel station. Groundwater and soil both revealed high concentrations of VOCs while soil samples revealed high concentrations of TPH. This indicates that the lighter fractions of the contaminants have been dissolved into the groundwater, and are expected to be mobilized in the direction of groundwater flow.

The horizontal extent of contamination has been identified to the north and west, but not to the south or east. The vertical extent of contamination in the soil has not been determined. Potential receptors include downgradient soil and groundwater, and ecological flora and fauna that inhabit the area immediately surrounding the site, such as invertebrates and grasses in the soil cover.

Additional investigations should be performed in this area to fully delineate the extent of contamination. This investigation should also focus on parameters that should be evaluated for the design of the remedial action. The scope of the investigation is discussed in Section 7.0 of this report.

6.2 UST AREA A2

Two UST locations were investigated at UST Area A2. The findings of these investigations are summarized in this subsection.

6.2.1 UST Location 69

High concentrations of VOCs were detected in samples analyzed by headspace screening at depths below 8 feet below ground surface. High concentrations of TPH were detected in samples selected for laboratory analysis from this location. The contaminated soil were found to extend below the limit of the excavator (12 feet), north and east under Building 102, and south under an underground high pressure steam line.

High concentrations of TPH detected at this UST location are likely to be a result of releases from the former UST system. Headspace screening with the FID did provide adequate indication of TPH contamination in this area.

The shallow groundwater in this area is the only potential receptor of concern. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial.

Building 102 is currently scheduled for demolition, and once it has been removed, the inaccessible contaminated soil will become accessible.

It is recommended that corrective action be undertaken in this area, as described in Section 7.0 of this report.

6.2.2 UST Location 70

Low concentrations of TPH were also found at this location in samples selected for laboratory analysis. No VOCs were detected by headspace analysis in samples collected from UST 70.

Contaminants were not detected at concentrations that present a threat of contaminant transfer to the shallow groundwater. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial in nature.

Due to the low contaminant concentrations in this area, no further actions are recommended for UST location 70.

6.3 UST AREA B

Two UST locations were investigated at UST Area B. The findings of these investigations are summarized in this subsection.

6.3.1 UST Location 56

Headspace VOC analysis of soil collected from UST location 56 indicates that VOCs are present in the soil at this location, although the TPH concentrations measured by laboratory analysis appear to be low. No TPH was detected in groundwater, and laboratory samples were not collected for VOCs in groundwater. Since no indication exists of surficial releases, the reason for the presence of the VOCs in this area is unknown. However, due to the low TPH concentrations in these soil, the former UST is an unlikely source of this contamination.

Potential receptors are limited to the ecological flora and fauna that inhabit the area immediately surrounding the site, such as invertebrates and grasses in the soil cover. The shallow groundwater in this area is also a potential receptor of concern.

Additional investigation and corrective action is recommended for this area, as described in Section 7 of this report.

6.3.2 UST Location 58

TPH sample results from soil collected at UST 58 indicate that high concentrations of TPH are present at the former location of the UST, at a depth of 4 to 6 feet below ground surface. The distribution of the contaminants indicates that they are a result of releases from the former UST.

Groundwater sample results indicate that the contaminants have not mobilized in the groundwater, although the contaminated soil are at the top of the water table. Low concentrations of VOCs were detected in soil samples analyzed by headspace screening.

Potential receptors are limited to the ecological flora and fauna that inhabit the area immediately surrounding the site. The shallow groundwater in this area is also a potential receptor of concern.

This area is recommended for corrective action, as described in Section 7.0 of this report.

6.4 UST AREA D1

Seven UST locations were investigated at UST Area D1. Due to the proximity of these locations, the nature of the area in which they are located, and the similarity of both the subsurface conditions and the analytical results, the findings of these investigations are summarized as a group.

High concentrations of TPH were detected in soil samples collected from UST locations 46, 47, 48, 62, and 63/71. Low VOC and TPH concentrations were detected in soil samples collected from UST locations 64 and 65. No TPH was detected in groundwater samples collected from the wells installed in this area, although traces of VOCs were detected, which could be attributed to fuel oil discharge from these USTs.

As discussed in Section 5.0 of this report, a solvent disposal area is located immediately north of these UST locations. The southwest movement of groundwater indicates that the area of the UST locations is particularly susceptible to groundwater contamination from the solvent disposal area. While benzene, ethylbenzene and xylene were detected in the groundwater wells installed near the UST locations, no solid conclusion can be reached that these contaminants are a result of the former USTs or are a part of the discharges to the disposal area.

The shallow groundwater in this area is the only potential receptor of concern. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial in nature.

Due to the proximity of the solvent disposal area, and the concentrations of TPH and VOCs detected in the soil and groundwater, no further action is recommended at this location with respect to the former USTs. The area is under investigation under CERCLA, and parallel investigations or remedial actions are not warranted by the concentrations of contaminants detected.

6.5 UST AREA D2: UST Location 10

One UST location (10) was investigated at UST Area D2. The findings of this investigation are summarized in this subsection.

High concentrations of headspace VOCs were detected in soil samples collected from this location, but low concentrations of TPH were detected in these samples. Traces of TPH were also detected in groundwater samples collected.

The northeast movement of groundwater indicates that the area could be susceptible to groundwater contamination from the solvent disposal area (Site 06). The leaching field for Buildings 68 and 31 is located immediately to the west of the UST location. Since trace petroleum was detected in groundwater and not detected at high concentrations in the soil, its presence may be due to solvent disposal in this area.

The shallow groundwater is the only potential receptor of concern. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial.

Due to the proximity of the Solvent Disposal Area (Site 06), and the low concentrations of TPH detected in the soil and groundwater, no further action is recommended at this location with respect to the former UST. This area is under investigation under CERCLA, and parallel investigations or remedial actions are not warranted by the concentrations of contaminants detected.

6.6 UST AREA E: UST Location 68

One UST location was investigated at UST Area E. The findings of this investigations are summarized in this subsection.

Section 4.0 of this report indicates that no TPH was detected in the subsurface soil tested at UST Location 68, but low concentrations of TPH and high concentrations of headspace VOCs were found in the surface soil. No contaminants were detected in the groundwater. If the contaminants in the surface soil were mobilized by the groundwater, they would move directly toward the harbor, 200 feet to the northeast. Petroleum contaminants would likely remain near the surface of the groundwater, but heavy chlorinated compounds would seep into the deep overburden and follow the preferential groundwater flow path.

Potential receptors are limited to the ecological flora and fauna that inhabit the area immediately surrounding the site. The shallow groundwater in this area is also a potential receptor of concern. If the contaminants were to become mobilized into the groundwater, the flora and fauna in Allen Harbor would be potential receptors.

The pattern of contaminants found in this area indicates they may be present as a result of a discharge to the ground surface. VOCs detected by headspace screening seem to be bound in the soil and are not becoming mobilized into the groundwater. Low TPH concentrations in the soil indicate that the contaminants in the surface soil are only VOCs, and not a result of petroleum products leaking from the UST.

No further action is recommended for this location under the UST program. If additional investigations are performed, they should focus on the housekeeping practices of the marina and yacht club.

6.7 UST AREA F1

Four UST locations were investigated at UST Area F1. The findings of these investigations are summarized in this subsection.

6.7.1 UST Location 25

VOCs and TPH were detected at low concentrations in the subsurface soil collected for headspace and laboratory analysis. No VOCs or TPH were detected in the groundwater samples collected.

As discussed in Section 5.0 of this report, a solvent disposal area is located immediately to the west of this UST location. The north-northeast movement of groundwater indicates that the area may be susceptible to groundwater contamination from this solvent disposal area.

Contaminants were not detected at concentrations that present a threat of contaminant transfer to the shallow groundwater. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial in nature.

Due to the current and future land use expected for these areas, the low concentrations of contaminants present, and the indications that contaminants present are not interacting with the groundwater in this area, no further actions are recommended for this UST location.

6.7.2 UST Location 26-28

VOCs and TPH were detected at low concentrations in the subsurface soil collected for headspace and laboratory analysis. Traces of TPH were detected in one of the three groundwater samples collected. In addition, traces of a chlorinated volatile organic compound, trichloroethene (TCE) were detected in the shallow groundwater. TCE is not a contaminant associated with the USTs formerly located at this site.

As discussed in Section 5.0 of this report, a solvent disposal area is located immediately to the west of this UST location. The north-northeast movement of groundwater indicates that the area may be susceptible to groundwater contamination from this solvent disposal area.

Contaminants were not detected at concentrations that present a threat of contaminant transfer to the shallow groundwater. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial.

Due to the current and future land use expected for these areas, the low concentrations of contaminants present, and the indications that contaminants present are not interacting with the groundwater in this area, no further actions are recommended for this UST location under the UST program. The TCE present in the shallow groundwater is likely to be an artifact of the CED Solvent Disposal Area to the west.

6.7.3 UST Location 66

High concentrations of TPH were detected in the surface soil and low concentrations of TPH were detected in the subsurface soil. Low concentrations of headspace VOCs were detected in this area.

As indicated in Section 5.0 of this report, a solvent disposal area is located immediately to the west of this UST location. The north-northeast movement of groundwater indicates that the area may be susceptible to groundwater contamination from this solvent disposal area.

The petroleum found to the north of former UST location 66 is likely from a petroleum discharge to the ground surface. The high TPH concentrations were only detected in the surface soil, rather than at the depths of the UST bottoms, and no TPH or VOCs were detected in groundwater samples collected.

Contaminants were not detected at concentrations that present a threat of contaminant transfer to the shallow groundwater. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial.

The pattern of contaminants in this area indicates that the TPH in the surface soil at this location are present as a result of surficial discharges during the operation of the vehicle maintenance facility. The low, associated concentrations of VOCs in headspace screening samples from the same locations indicate that these contaminants are likely a result of an old release, and the volatile fractions have dissipated. Therefore, no further action is recommended for this location under the UST program. If additional investigations are performed in this area, they should focus on the history and past spills within the area north and adjacent to Building 224.

6.7.4 UST Location 37-40

High concentrations of TPH were found in the subsurface soil at UST Location 37-40. The low associated concentrations of VOCs in headspace screening samples from the same locations indicate that these contaminants are likely a result of an old release, and the volatile fractions have dissipated.

Section 5.0 of this report indicates that a solvent disposal area is located immediately to the west of this UST location. The north-northeast movement of groundwater indicates that the area may be susceptible to groundwater contamination from this solvent disposal area.

Petroleum contaminants found in the area of former USTs 37-40 are likely to be a result of a release from these former USTs. However, since groundwater is at a depth of approximately 20 feet below ground surface, and TPH samples were only collected to a depth of 12 feet below ground surface, no determination can be made that this release has affected the groundwater. VOCs were not detected in soil samples collected for laboratory analysis from the borings in this area.

The groundwater in this area is the only potential receptor of concern. Conditions in the immediate vicinity indicate that no ecological receptors are present. The immediate vicinity and the downgradient areas are all industrial.

Due to the proximity of the CED Solvent Disposal Area, the CED Battery Acid Disposal Area, and the low concentrations of VOCs detected in the soil, no further action is recommended at this location with respect to the former UST. This area is under investigation under CERCLA, and parallel investigations or remedial actions are not warranted by the concentrations of contaminants detected.
Future CERCLA investigators should be made aware that this UST location contains an undetermined amount of soil contaminated with TPH at concentrations greater than 1000 mg/kg.

7.0 PRELIMINARY CORRECTIVE ACTION PLAN

This section presents preliminary corrective action plans for 7 UST locations. Corrective actions were recommended for these UST locations in Section 6.0. Recommendations are based on the findings of this investigation described in Sections 4.0 and 5.0 of this report.

The descriptions of the corrective actions presented in this section are intended to comply with the requirements described in Section 14.12 of the Regulations for Underground Storage Facilities Used for Petroleum Products and Hazardous Materials (RIDEM, December 1993). These requirements include a summary of the proposed remedial actions, a proposed schedule for the implementation of the remedial action, and a description of follow-up investigations, if they are appropriate.

The corrective actions described in this section include excavations, continued investigations, and follow-up sample collection and analysis. While the principal components of these actions are presented in the following sections of this corrective action plan, HNUS proposes to use the technical guidelines presented in the Work Plan for UST Remedial Investigation (HNUS April 1994) (work plan) to direct most of the remedial actions and additional investigations where they are appropriate. An addendum to the work plan will be required because the tasks are slightly different from those scoped in the UST RI. The pertinent technical guidelines to be taken from the work plan are highlighted in the following sections.

7.1 UST LOCATION 5

UST 5 was abandoned in place (filled with cement) in the west alcove at Building 45 (Figure 4-2). The confined space of the alcove precluded the UST's removal, and subsequently, the installation of borings with a full-size drilling apparatus.

The proximity of Building 45 precludes UST excavation without damage to or removal of the building. Vapor extraction systems would not be effective on the contaminants present, due to a lack of volatile organic constituents. Therefore, a semiannual groundwater monitoring program should be initiated and continued until a permanent solution is implemented.

If petroleum contaminants are not being transported into and by the groundwater, and the land use is classified as industrial, the permanent solution may be no further action. If contaminants have reached the groundwater, groundwater treatment can be performed until the source has been eliminated.

The groundwater monitoring system should include 3 shallow monitoring wells, one screened across the water table, and two screened in the shallow saturated overburden. These wells should be placed in the hydraulically downgradient location (south-southeast of the UST location). The well screened across the water table should be placed in the west alcove of Building 45; the two remaining wells should be placed along the southern exterior of the building. Groundwater should be sampled during each event for TPH and VOCs.

7.1.1 Technical Guidelines

The technical guidelines specified in the Work Plan for UST Remedial Investigation at the NCBC Davisville (HNUS April 1994) will be used to install of groundwater monitoring wells, and to collect groundwater samples. The quality control criteria, sample designation guidelines, decontamination procedures, data validation procedures and management of investigation - derived waste procedures are all described in detail in the work plan.

An addendum to the work plan will be required to execute the groundwater monitoring program at UST Location 5. This work plan addendum will describe the number of samples to be collected, analytical parameters, preservatives, holding times, and other relevant requirements not described in the work plan.

An addendum to the Remedial Investigation Report and a Final Corrective Action Plan will be prepared and submitted to the regulatory authorities prior to initiation of the remedial action.

7.1.2 Schedule

The following schedule is presented for the Corrective Action Plan (CAP) for UST Location 5:

Preliminary Cap approved by RIDEM	December 31, 1994
Amendment to the work plan approved	May 1995
Groundwater monitoring system installed	June 1995
Groundwater samples collected	July 1995
Addendum to the Remedial Investigation Report and CAP	December, 1995
Semi-annual monitoring 1 completed	February 1995
Semi-annual monitoring 2 completed	August 1996
Semi-annual monitoring 3 completed	February 1997

7.2 UST LOCATION 6

TPH was detected above the action level of 300 mg/kg in soil collected from boring 6-B1 (Figure 4-3). However, the distribution of this contaminant indicate that it is not an immediate threat to the groundwater or other receptors in the area.

However, because the level is above the action level, an excavation should be performed that will remove the contaminated soil from the area of Boring B1. This excavation will be performed to remove the source, and allow confirmation soil samples to be collected to ensure that the extent of contamination concentration above the action level has been reached.

Excavation is a simple approach to target a small shallow area of soil contamination above the groundwater elevation. Using this approach, the source area is completely eliminated, and little residue remains in the ground. However, excavation of soil results in the collection of large quantities of contaminated soil, with moderately high disposal costs.

7.2.1 Technical Guidelines

Prior to initiating the excavation, subsurface utilities maps will be obtained from NAVFAC on-site representatives. The underground features on these drawings in the area of the excavation will be reviewed by the HNUS field supervisor and the excavation foreman. If necessary, exact locations will be determined by measuring from above ground features and marking pavement.

The excavation at UST location 6 will begin at the underground utility line immediately west of the UST and continue west and north to form an approximate 10- foot square parallel to the utility. This excavation will be continued to approximately 10 feet below ground surface, where soil samples indicated a concentration of 120 mg/kg. All the soil will be containerized for removal from the site as oil spill debris or a similar disposal code. Five composite soil samples will be retrieved from the bottom and sides of this excavation to confirm that the limits of TPH concentrations exceeding 300 mg/kg TPH was removed.

Because the correlation between headspace VOC concentrations and TPH concentrations at this location were poor, the excavation will not be directed by monitoring soil samples with a headspace screening analysis. All soil within the dimensions of the excavation will be stockpiled as oil-contaminated materials.

After completion of the excavation, representative samples of the bottom and sides of the excavation will be collected for TPH analysis (described in Section 3.0 of the work plan). The excavated material should be sent to an asphalt batching plant for recycling. Analytical parameters required for this purpose are described on Table 3-2 of the work plan. These stockpiled soil will be staged in steel roll-off containers and securely covered until shipment.

The excavations will be made in an orderly manner, such that each interval of the excavation can be accurately recorded for future reference. A separate log will be completed for each phase, describing the area excavated, locations of samples collected, and areas of additional contamination expected.

The HNUS field supervisor will maintain logs of the excavation, collect samples, and direct the excavation.

7.2.2 Follow-up Investigations

Because no TPH has been detected in the well installed at this UST location, a groundwater monitoring program has not been scoped.

7.2.3 Schedule

The following schedule is presented for the CAP for UST location 6:

Preliminary CAP approved by RIDEM	December 31, 1994
Amendment to the work plan approved	May 1995
Target area excavated	July 1995
Site soil removed	July 1995
Remedial Action Report	December 1995

7.3 UST LOCATION 7

TPH above the action level of 300 mg/kg was detected in soil collected from boring 7-B2 (Figure 4-4). An excavation should be performed that will remove the soil contaminated with TPH above the action level from the area of Boring 7-B2. This excavation will remove the source area, and allow confirmation soil samples to be collected to ensure that the extent of contamination has been reached. In addition, a groundwater monitoring well should be installed to confirm that the groundwater has not been affected by this release.

7.3.1 Technical Guidelines

Prior to initiating the excavation, subsurface utilities maps will be obtained from NAVFAC on-site representatives. The underground features on these drawings in the area of the excavation will be reviewed by the HNUS field supervisor and the excavation foreman. If necessary, exact locations will be determined by measuring from above ground features and marking pavement.

The excavation at UST location 7 will begin at the UST location adjacent to the eastern side of Building 47, and continue east approximately 20 feet, which is a midpoint between borings 7-B2 and 7-B1. The excavation will be finished as a 20- foot square parallel to the underground utility line south of the UST location.

This excavation will be continued to approximately 12 feet below ground surface where no TPH was detected. All the excavated soil will be containerized for removal from the site as oil spill debris or a similar disposal code. Five representative soil samples will be retrieved from the bottom and sides of this excavation to confirm that the soil exceeding 300 mg/kg TPH was removed.

Because the correlation between headspace VOC concentrations and TPH concentrations at this location were poor, the excavation will not be directed by monitoring soil samples with a headspace screening analysis. All soil within the dimensions of the excavation will be stockpiled as oil-contaminated materials.

The excavated soil should be sent to an asphalt batching plant for recycling. Analytical parameters required for this purpose are described on Table 3-2 of the work plan. Stockpiled soil will be staged in steel roll-off containers and securely covered until shipment.

The excavations will be made in an orderly manner, such that the excavation can be accurately recorded for future reference. A separate log will be completed for each excavation, describing the area excavated, locations of samples collected, and areas of additional contamination expected.

The HNUS field supervisor will maintain logs of the excavation, collect samples, and direct the excavation.

7.3.2 Follow-up Investigations

The groundwater monitoring system should include one shallow monitoring well screened across the water table in a hydraulically downgradient location (south-southeast of the UST location).

Groundwater should be sampled following the excavation for TPH and VOCs. If contaminants are detected in the groundwater, this corrective action plan should be modified, as appropriate.

7.3.3 Schedule

The following schedule is presented for the CAP for UST location 7:

Preliminary CAP approved by RIDEM	December 31, 1994
Work plan amendment approved	May 1995
Target area excavated	July 1995
Soil removed	July 1995
Groundwater monitoring system installed	June 1995
Groundwater samples collected	June 1995
Remedial Action Report	December 1995

7.4 UST LOCATION 11-22

TPH and VOCs were detected at concentrations above the action levels in soil collected from borings at this location (Figure 4-7). Groundwater was also found to contain VOCs above maximum contaminant levels.

A corrective action at this location cannot be fully scoped at this time, due to limitations of available data. The investigations performed at this location have identified a contaminant problem that will require remedial action, but the action cannot be selected until the nature and extent of contamination in soil and groundwater is better delineated.

A pre-design investigation is recommended to determine the feasibility of various remedial technologies at this location. Based on preliminary results, the soil conditions and contaminants present appear to be amenable to soil vapor extraction. However, air sparging might also be used to remove VOCs from the groundwater. The feasibility of a standard pump and treat system should also be evaluated. Prior to remedy selection, the limits of contamination must be fully established, and other subsurface conditions must be fully evaluated.

7.4.1 Technical Guidelines

Predesign investigations should include: 1) sample collection for VOCs in soil gas, 2) boring/well installation and confirmatory soil and groundwater sample collection, 3) limited soil and groundwater

samples analyses for full chemical and physical parameters, 4) remedial alternatives comparison, and 5) remedial design selection.

The technical guidelines specified in the Work Plan for UST Remedial Investigation at the NCBC Davisville (HNUS April 1994) will be used to install additional groundwater monitoring wells, and to collect soil and groundwater samples. The quality control criteria, sample designation guidelines, decontamination procedures, data validation procedures and management of investigation - derived waste procedures are all described in detail in the work plan.

An addendum to the work plan will be required to execute of the predesign investigation at UST Location 11-22. This addendum will describe the number and types of samples to be collected, analytical parameters, preservatives, holding times, and other relevant requirements not described in the work plan.

An addendum to the Remedial Investigation Report and a Final Corrective Action Plan will be prepared and submitted to the regulatory authorities prior to initiation of the remedial action.

7.4.2 Follow-up Investigations

A semiannual groundwater monitoring program should be initiated and continued until the remedial action is completed. However, the scope of this program will be determined based on the results of the predesign investigation. The groundwater monitoring program will be presented in the Design Report and Final Corrective Action Plan.

7.4.3 Schedule

The following schedule is presented for the Predesign Investigation and CAP for UST location 11-22. This schedule outlines a two year monitoring program although the actual duration of the program will depend on the time required for the completion of the remedial action.

Preliminary CAP approved by RIDEM	December 31, 1994
Work plan amendment approved	May 1995
Additional investigations initiated	May 1995
Groundwater Samples Collected	June 1995
Addendum to Remedial Investigation Report and CAP	December 1995

Semi-annual monitoring 1 completed	February 1996
Semi-annual monitoring 2 completed	August 1996
Semi-annual monitoring 3 completed	February 1996

7.5 UST LOCATION 69

TPH above the action levels was detected in soil samples collected during test pit excavations (Figure 4-8). A clear correlation was evident between headspace VOCs and TPH contamination. Therefore, headspace monitoring can be used to direct future excavations in this area.

This area should be re-excavated following the demolition of Building 102 (projected to be completed before September 1995). The scope of work for this final excavation would include arrangements to close off the underground high pressure steam line that interfered with the previous excavation to the south. In addition, a groundwater sample collection point should be installed to confirm that the groundwater has not been affected by this release.

7.5.1 Technical Guidelines

Prior to initiating the excavation, subsurface utilities maps will be obtained from NAVFAC on-site representatives. The underground features on these drawings in the area of the excavation will be reviewed by the HNUS field supervisor and the excavation foreman. If necessary, exact locations will be determined by measuring from above ground features and marking pavement.

The excavation will begin at the UST location south of the building, and continue south past the location of the underground steam line, east and north past the location of the present building foundation.

Upon location of the underground steam line, the line will be excavated to the east 30 feet to remove part of the line. The open ends will be temporarily capped. The trench excavation performed to expose the steam line will be sloped on grade, as required by Occupational Safety and Health Administration (OSHA) regulations for human entry.

The soil excavation will be continued in the location of the former UST to south, east, and north until the limit of the contaminated soil are reached. The excavation may extend 15 feet or more below ground surface. Delineation of contaminated soil will be made based on headspace screening analysis performed in the field (>20 ppm total VOCs will indicate the presence of soil with TPH concentrations above the action level). The contaminated soil will be containerized for removal from the site as oil

spill debris or a similar disposal classification. Composite soil samples will be retrieved from the bottom and sides of this excavation to confirm that the soil exceeding 300 mg/kg TPH was removed.

The excavation will be halted at a maximum radius of 50 feet from the expected source area if soil exhibiting less than 20 ppm by headspace screening are not reached.

If contaminated soil (those that exceed 20 ppm total VOC by headspace analysis) are encountered, they will be stockpiled separately from other subsurface materials. Excavated material should be sent to an asphalt batching plant for recycling. Analytical parameters required for this purpose are described on Table 3-2. These stockpiled soil will be staged in steel roll - off containers and securely covered until shipment off site.

The excavations will be made in an orderly manner, such that the excavation can be accurately recorded for future reference. A log will be completed for each excavation, describing areas excavated, locations of samples collected, and areas of additional contamination expected.

Following completion of the excavation, the underground steam line will be replaced and the site will be restored to its original condition.

7.5.2 Follow-up Investigations

A groundwater monitoring system will be installed, which will include two shallow monitoring wells screened across the water table in hydraulically downgradient locations (south-southeast of the UST location). Groundwater should be sampled following the excavation for TPH and VOCs.

If contaminants are detected in the groundwater, this CAP should be modified as appropriate. The technical guidelines specified in the Work Plan for UST Remedial Investigation at the NCBC Davisville (HNUS April 1994) will be used to install groundwater monitoring wells, and collect groundwater samples. The quality control criteria, sample designation guidelines, decontamination procedures, data validation procedures and management of investigation - derived waste procedures are all described in detail in the work plan.

An addendum to the work plan will be required for the execution of the groundwater monitoring program at UST Location 69. This addendum will describe the number of samples to be collected, analytical parameters, preservatives, holding times, and other relevant requirements not described in the work plan.

7.5.3 Schedule

The following schedule is presented for the CAP for UST Location 69:

Preliminary CAP approved by RIDEM	December 31, 1994
Work plan amendment approved	May 1995
Target area excavated	July 1995
Soil removed	July 1995
Groundwater monitoring system installed	June 1995
Groundwater samples collected	June 1995
Remedial Action Report	December 1995

7.6 UST LOCATION 56

A review of the analytical data was inconclusive, because headspace VOCs were detected in soil but the concentration of TPH in laboratory samples was low (Figure 4-10). Laboratory data on the VOC content in groundwater and soil was not scoped for this investigation. The type of VOCs present should be determined prior to initiation of corrective action at this location.

If it is determined that the VOCs contaminants are: 1) present at concentrations below action levels and not being transported into and by the groundwater, or 2) VOCs are not present as a result of the presence of the former UST, the permanent solution may be no further action.

7.6.1 Technical Guidelines

A second phase investigation should be initiated that will fill the data gaps identified above. This investigation will involve collection of soil samples from one final boring installed immediately downgradient of the former UST, from an interval of 8 to 12 feet below ground surface. These samples will be analyzed for TPH and a full range of volatile organic compounds. One additional groundwater well will be installed 20 feet downgradient of the UST location. Two groundwater samples will be collected (one from the existing well and one from the new monitoring well), which will be analyzed for a full range of volatile organic compounds and TPH.

The technical guidelines specified in the Work Plan for UST Remedial Investigation at the NCBC Davisville (HNUS April 1994) will be used to install groundwater monitoring wells and collect groundwater samples. The quality control criteria, sample designation guidelines, decontamination procedures, data validation procedures and management of investigation - derived waste procedures are all described in detail in the work plan.

An addendum to the work plan will be required for the execution of the groundwater monitoring program at this location. This addendum will describe the number of samples to be collected, analytical parameters, preservatives, holding times, and other relevant requirements not described in the work plan.

An addendum to the Remedial Investigation Report and a Final Corrective Action Plan will be prepared and submitted to the regulatory authorities prior to initiation of the remedial action.

7.6.2 Schedule

The following schedule is presented for the second phase of investigation and CAP for UST location 56:

Preliminary CAP approved by RIDEM	December 31, 1994
Work plan amendment approved	May 1995
Additional investigations initiated	June 1995
Corrective Action Plan for UST 56 approved	December 1995
Addendum to the Remedial Investigation Report and CAP	December 1995

7.7 UST LOCATION 58

TPH concentrations above the action level of 300 mg/kg was detected in soil collected from boring 58-B1 (Figure 4-11). An excavation should be performed that will remove the soil from the UST location. This excavation will remove the source, and allow confirmation soil samples to be collected to ensure that the contamination has been removed.

7.7.1 Technical Guidelines

Prior to the initiation of the excavation, subsurface utilities maps will be obtained from NAVFAC on-site representatives. The underground features on these drawings in the area of the excavation will be reviewed by the HNUS field supervisor and the excavation foreman. If necessary, exact locations will be determined by measuring from above ground features and marking pavement.

This will be a 20-foot by 20- foot excavation oriented parallel to, and east of, the former building foundation. If groundwater is encountered, the excavation should be drained, and water should be containerized for disposal off site as oil spill debris or similar appropriate waste code.

This excavation will be continued to 12 feet below ground surface, where soil samples indicated concentrations of TPH detected below the action level. Excavated soil will be containerized for removal from the site as oil spill debris or a similar disposal classification. Five composite soil samples will be retrieved from the bottom and sides of this excavation to confirm complete removal of the soil exceeding 300 mg/kg TPH.

Because the correlation between headspace VOC concentrations and TPH concentrations at this location was poor, the excavation will not be directed by monitoring soil samples with a headspace screening analysis.

The excavations will be made in an orderly manner, such that the excavation can be accurately recorded for future reference. A log will be completed for each excavation, describing the area excavated, locations of samples collected, and areas where additional contamination is expected.

The HNUS field supervisor will maintain logs of the excavation, collect samples, and direct the excavation.

7.7.2 Follow-up Investigations

Because no TPH has been detected in the well installed at this UST location, a groundwater monitoring program has not been scoped.

7.7.3 Schedule

The following schedule is presented for the CAP for UST location 56:

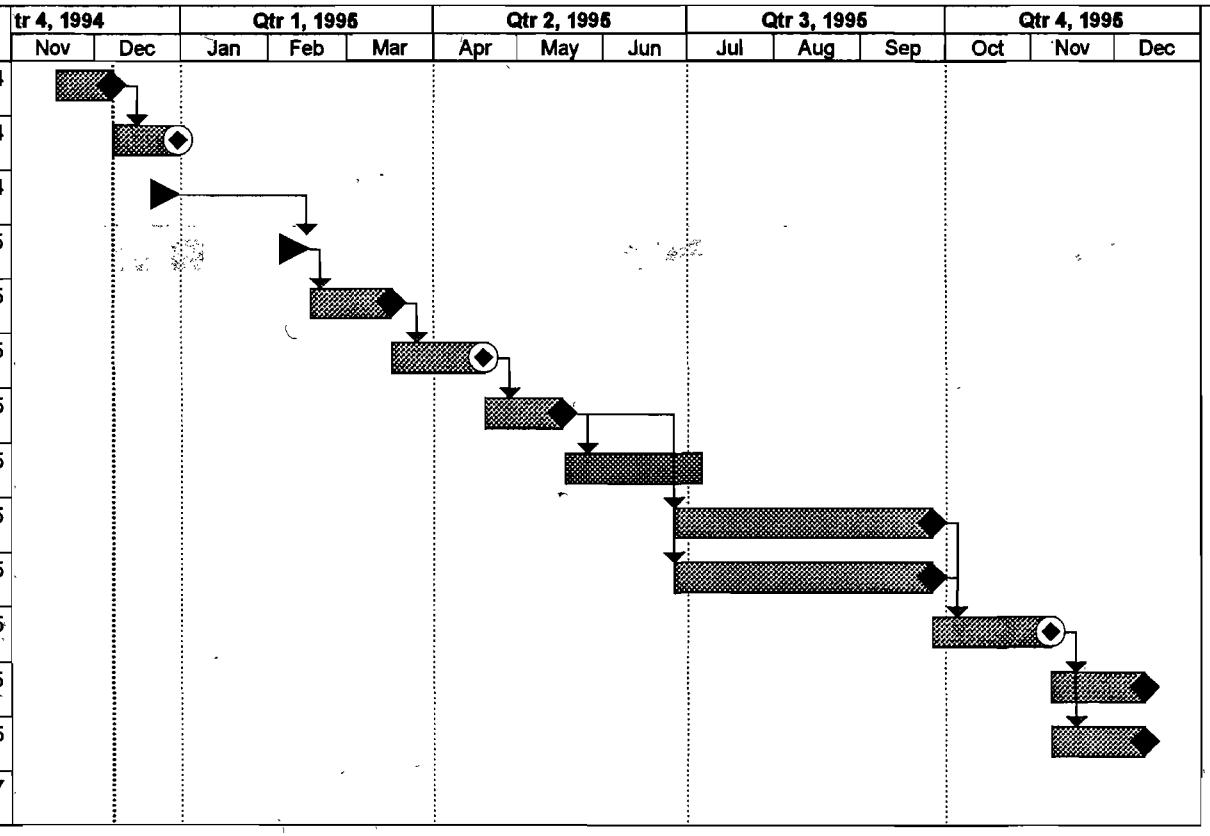
Preliminary CAP approved by RIDEM	December 31, 1994
Work plan amendment approved	May 1995
Target area excavated	July 1995
Soil removed	July 1995
Remedial Action Report	December 1995

7.8 SUMMARY

This subsection presents a summary of the schedules for additional investigations and corrective action. This schedule is depicted on Figure 7-1.

Figure 7-1
Projected Schedule for UST Corrective Actions
Former NCBC Davisville

ID	Task Name	Start	Finish
1	Prepare Final RI and Preliminary CAP	11/17/94	12/6/94
2	RIDEM/Navy reveiew, approve RI and Preliminary CAP	12/7/94	12/30/94
3	NAVFAC Initiate CTO	12/31/94	12/31/94
4	NAVFAC Award CTO	2/15/95	2/15/95
5	Prepare Draft Work Plan Addendum (WPA)	2/16/95	3/16/95
6	DEM/Navy Review of WPA	3/17/95	4/18/95
7	Prepare Final WPA	4/19/95	5/16/95
8	RA work @ UST 6, 7, 58, 69, Addl. RI work @ UST 5, 11-22, 56	5/18/95	7/5/95
9	Prepare Draft RA Reports for USTs 6,7,58, 69	6/26/95	9/25/95
10	Prepare Draft RI Addendum, and CAPs for USTs 5, 11-22, 56	6/26/95	9/25/95
11	DEM/ Navy review of RA Report, RI Addendum and CAPs	9/26/95	11/7/95
12	Prepare Final RA Reports for USTs 6,7,58, 69	11/8/95	12/11/95
13	Prepare Final RI Addendum and CAPs for USTs 5, 11-22, 56	11/8/95	12/11/95
14	Semiannual monitoring, 3 rounds, field work and reports	2/5/96	2/14/97



PDI - Predesign Investigation
WPA - Work Plan Amendment
CAP - Corrective Action Plan

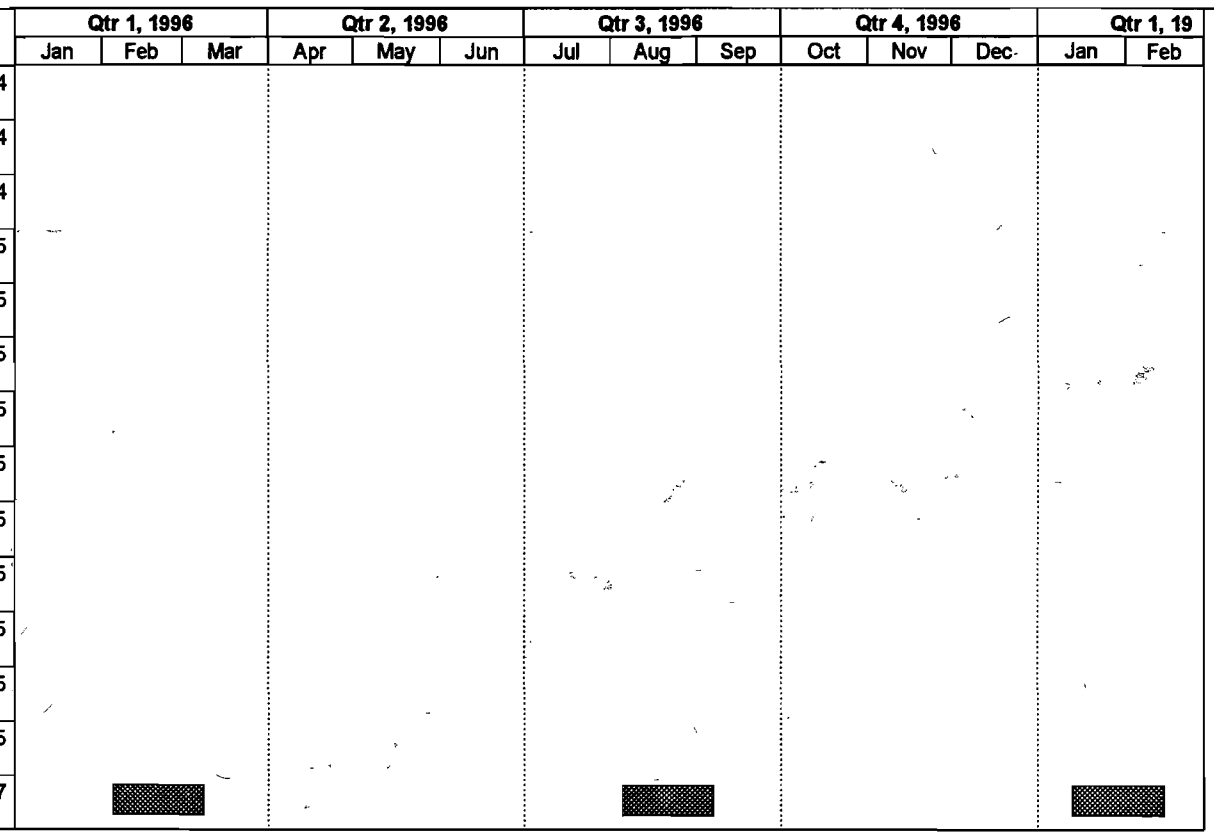
Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

Page 1 of 2

W5294052F

Figure 7-1
Projected Schedule for UST Corrective Actions
Former NCBC Davisville

ID	Task Name	Start	Finish
1	Prepare Final RI and Preliminary CAP	11/17/94	12/6/94
2	RIDEM/Navy reveiew, approve RI and Preliminary CAP	12/7/94	12/30/94
3	NAVFAC Initiate CTO	12/31/94	12/31/94
4	NAVFAC Award CTO	2/15/95	2/15/95
5	Prepare Draft Work Plan Addendum (WPA)	2/16/95	3/16/95
6	DEM/Navy Review of WPA	3/17/95	4/18/95
7	Prepare Final WPA	4/19/95	5/16/95
8	RA work @ UST 6, 7, 58, 69, Addl. RI work @ UST 5, 11-22, 56	5/18/95	7/5/95
9	Prepare Draft RA Reports for USTs 6,7,58, 69	6/26/95	9/25/95
10	Prepare Draft RI Addendum, and CAPs for USTs 5, 11-22, 56	6/26/95	9/25/95
11	DEM/ Navy review of RA Report, RI Addendum and CAPs	9/26/95	11/7/95
12	Prepare Final RA Reports for USTs 6,7,58, 69	11/8/95	12/11/95
13	Prepare Final RI Addendum and CAPs for USTs 5, 11-22, 56	11/8/95	12/11/95
14	Semiannual monitoring, 3 rounds, field work and reports	2/5/96	2/14/97



PDI - Predesign Investigation
WPA - Work Plan Amendment
CAP - Corrective Action Plan

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

On September 22, 1994, Naval Facilities Engineering Command (NAVFAC) presented the Draft UST Remedial Investigation Report and Preliminary CAP to RIDEM. RIDEM reviewed this document, and final submission is to be December 1994. RIDEM approval of the Draft UST RI and CAP is expected on December 31, 1994.

In March 1995, NAVFAC will publish a Draft Work Plan Amendment (WPA) that will describe tasks for additional investigations and initial corrective actions outlined in this Preliminary CAP. After a review period for RIDEM, this WPA will be submitted as Final.

In June 1995, NAVFAC will mobilize for initial excavation of UST locations 6, 7, 69, and 58. At the same time, additional investigations will be initiated at UST locations 5, 11-22 and 56. The field work will be directed by the Work Plan for UST Remedial Investigation (HNUS, April 1994) and the WPA, prepared as described above.

In July 1995, contaminated soil and investigation - derived waste from the excavations and additional investigations will be removed from the site.

In September 1995, a Remedial Action Report will be prepared that will describe the field work performed in June and July. This report will present:

- a summary of excavations performed,
- the results from samples collected during the field effort, and
- the need for additional excavation work at UST locations 6, 7, 69, and 58.

A report on the additional investigations will also be prepared in September 1995 for UST Locations 5, 11-22, and 56. This report will present a description of the findings of the second-phase investigations at UST Locations 5, 11-26, and 56, and a final CAP for any further actions at these locations.

These reports will be prepared in Draft and after a review period for RIDEM, they will be submitted as Final.

In June 1996, NAVFAC will mobilize for semi-annual groundwater monitoring at UST location 5 and 11-22, which will continue until February 1997.

REFERENCES

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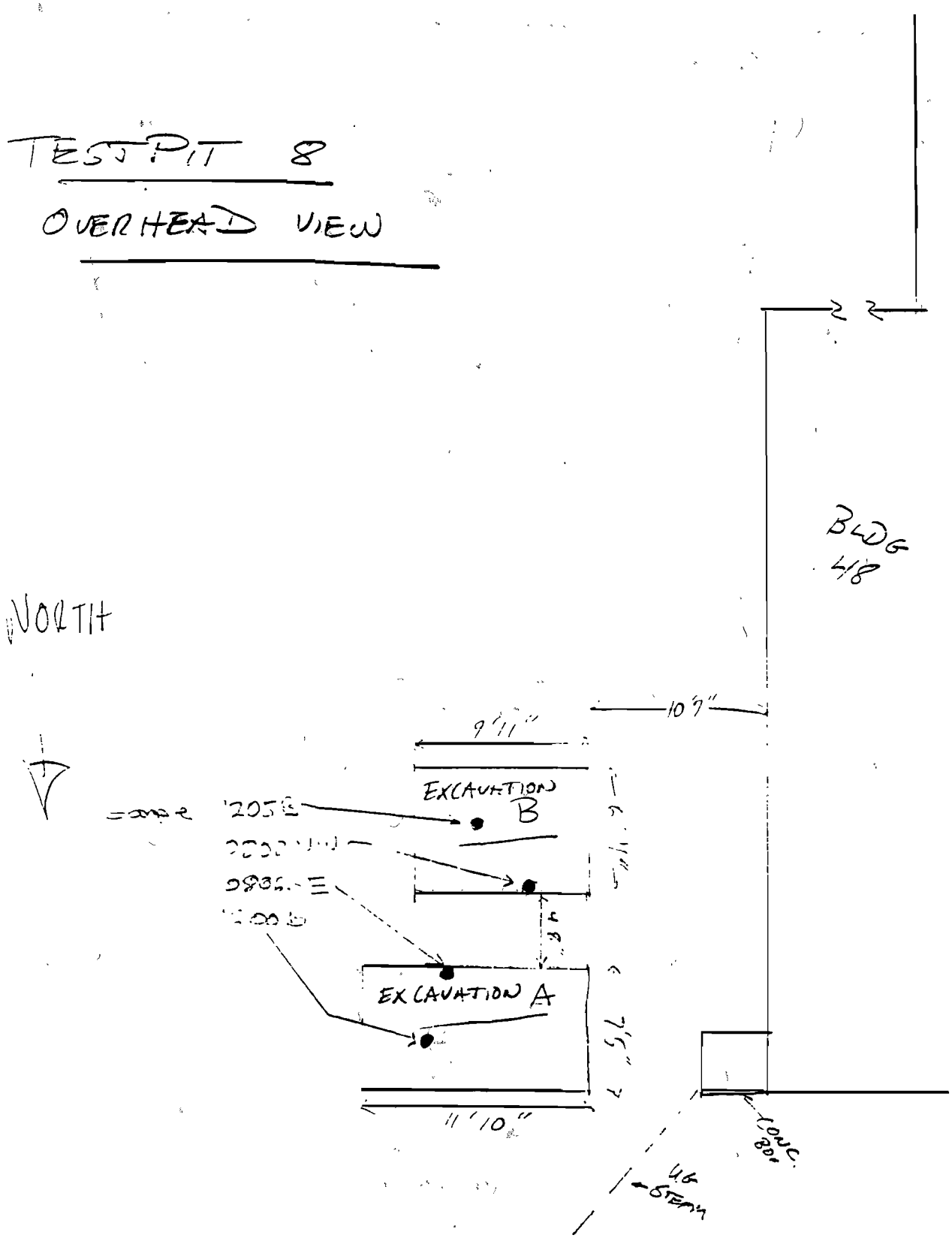
APPENDIX A

TEST PIT LOGS

HALLIBURTON NUS Environmental Corporation and Subsidiaries		STANDARD CALCULATION SHEET	
CLIENT: CTO 178	FILE NO.:	BY: PILLION	PAGE 1 OF 2
SUBJECT: TP8		CHECKED BY: PARKER	DATE: 8/16/94

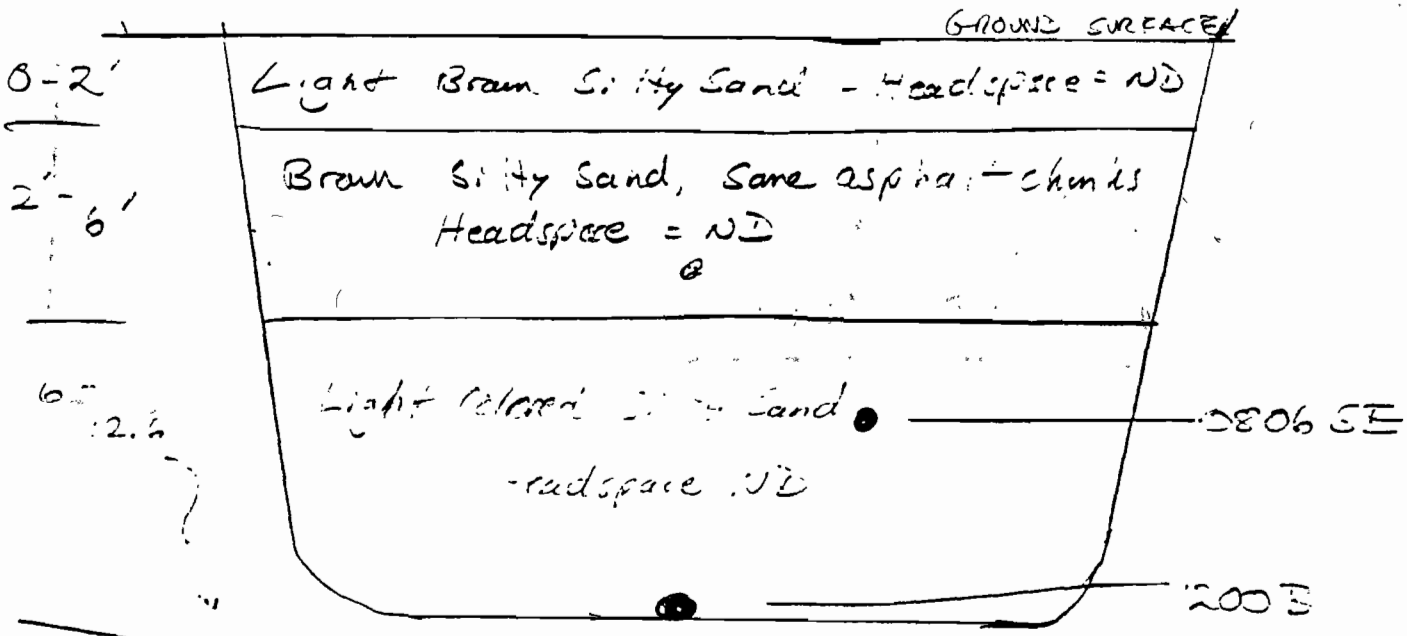
TEST PIT 8

OVERHEAD VIEW

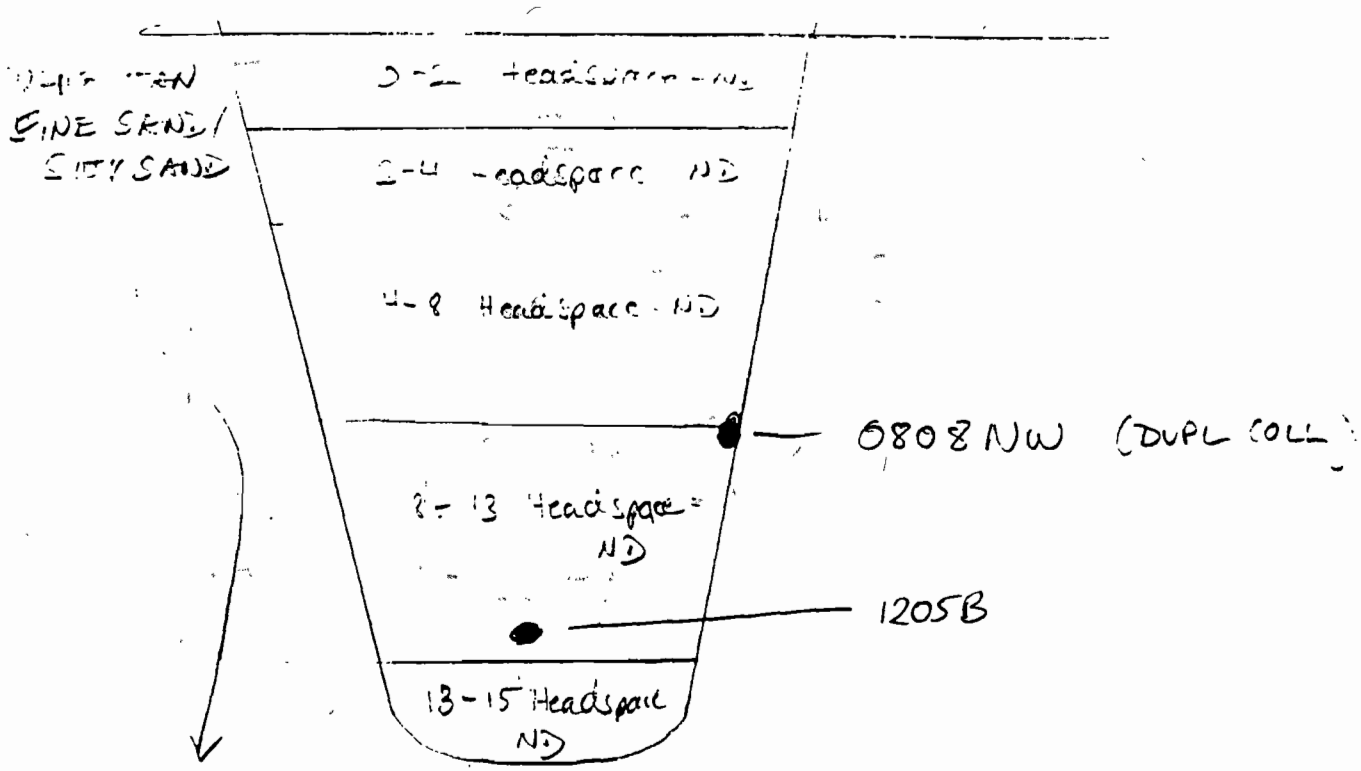


HALLIBURTON NUS Environmental Corporation and Subsidiaries		STANDARD CALCULATION SHEET	
CLIENT: CTO 178	FILE NO.:	BY: PILLION	PAGE 2 OF 2
SUBJECT: TP8		CHECKED BY: PAULKER	DATE: 8/16/94

VERTICAL PROFILE: EXCAVATION A



VERTICAL PROFILE
EXCAVATION B



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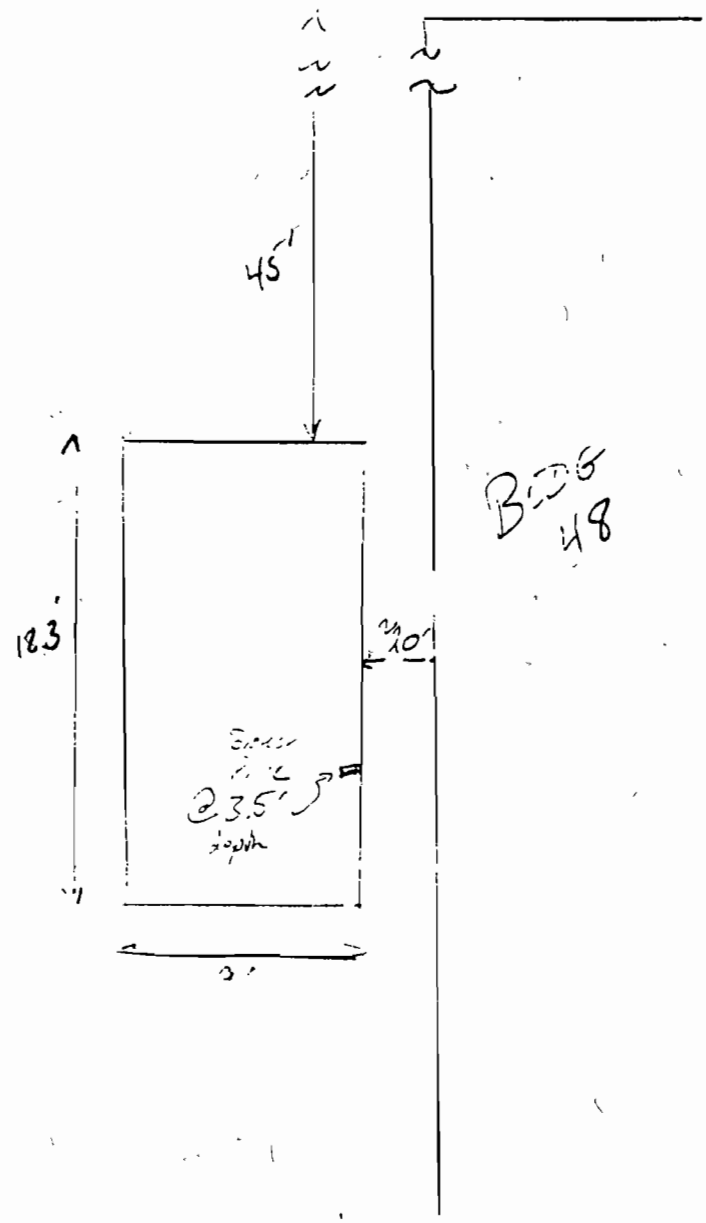
CLIENT: [illegible]	FILE NO.:	BY: [illegible]	PAGE 2 OF 2
SUBJECT: [illegible]		CHECKED BY: [illegible]	DATE: 8/15/94

N

OVERHEAD VIEW

UST LOCATION 9



HALLIBURTON NUS Environmental Corporation and Subsidiaries			STANDARD CALCULATION SHEET
CLIENT: CTC 178	FILE NO.:	BY: DILLON	PAGE 2 OF 2
SUBJECT: TP 9		CHECKED BY: PARKER	DATE: 2/15/94

VERTICAL PROFILE

UST LOCATION 9

BLDG BEHIND TP

GROUND SURFACE

0-1' Sand / SILT GRAVEL HEADSPACE = ND

1-3' Sand / SILT GRAVEL HEADSPACE = ND

3-4.5 RED-BROWN COARSE SAND

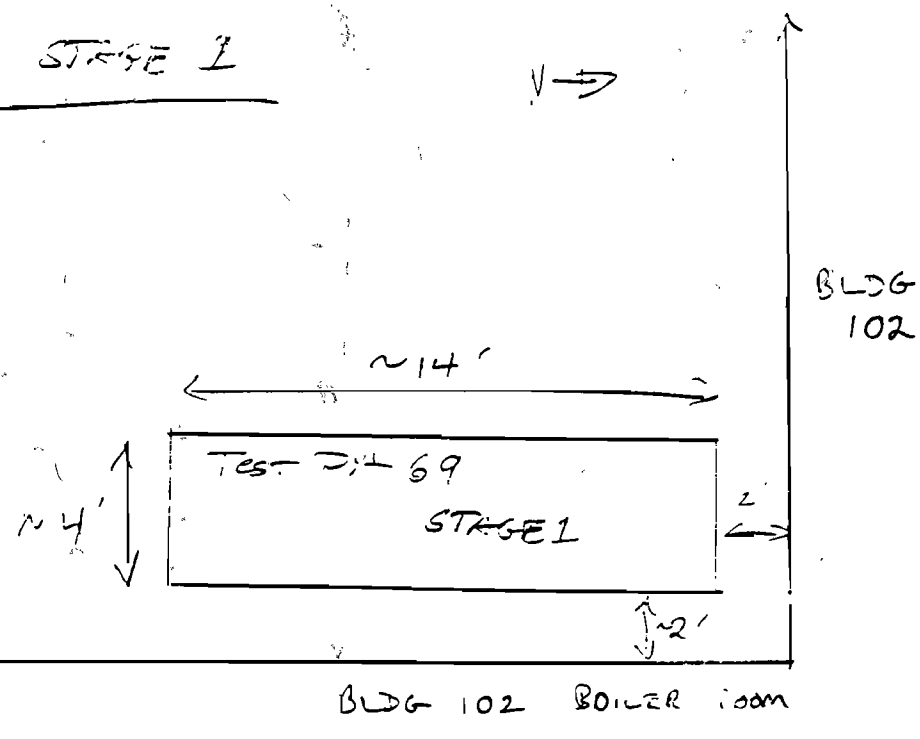
4.5 - 12' FINE WHITE-TAN SAND

• 07022 ND* • 07055 ND

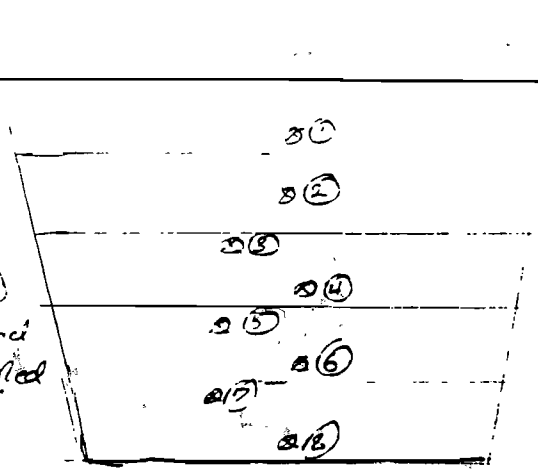
* [illegible] TPH and VOCs

HALLIBURTON NUS Environmental Corporation and Subsidiaries		STANDARD CALCULATION SHEET	
CLIENT: CTO 178	FILE NO.:	BY: DARKER	PAGE 1 OF 3
SUBJECT: TP 69		CHECKED BY:	DATE: 7/11/94

EXCAVATION STAGE 1



VERTICAL PROFILE: STAGE 1



1-2: Silty Sand/Gravel Brown

2-6: Silty Sand/Gravel (Brown)

6-7 - Coarse Red-Brown Sand

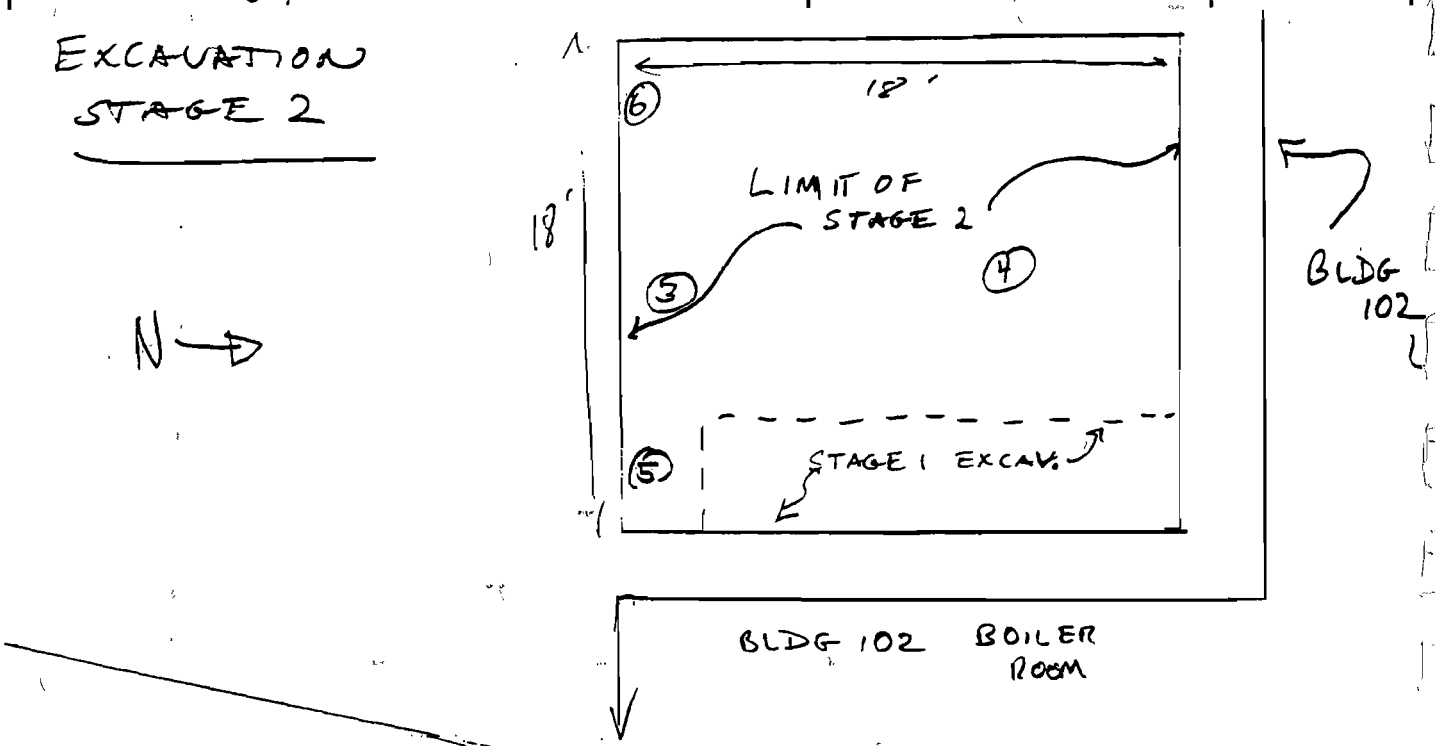
7-8 - Mix: Sand Gravel - Red Brown Coarse Sand

KEY	SAMPLE	Headspace	Lab
1	0202	ND	NO
2	0204	7	
3	0405	18	
4	0506	ND	
5	0607	35	
6	0708	37	
7	0807	37	
8	0810	80	

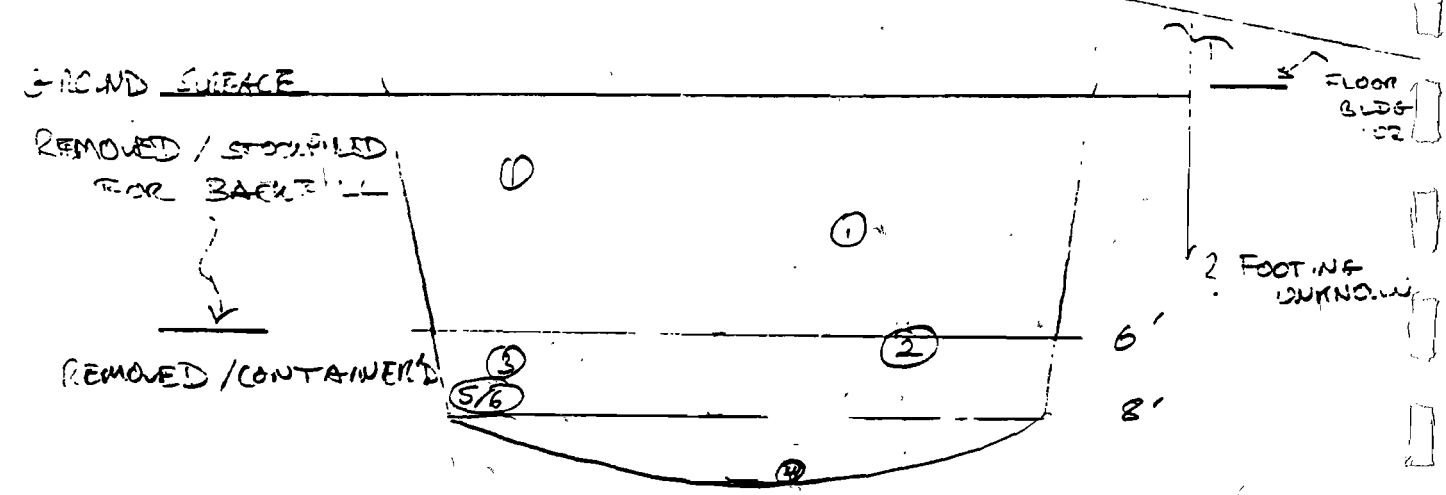
? FOOTING UNKNOWN

HALLIBURTON NUS Environmental Corporation and Subsidiaries		STANDARD CALCULATION SHEET	
CLIENT: CTO 178	FILE NO.:	BY: PARKER	PAGE 2 OF 3
SUBJECT: TP69		CHECKED BY:	DATE:

EXCAVATION STAGE 2

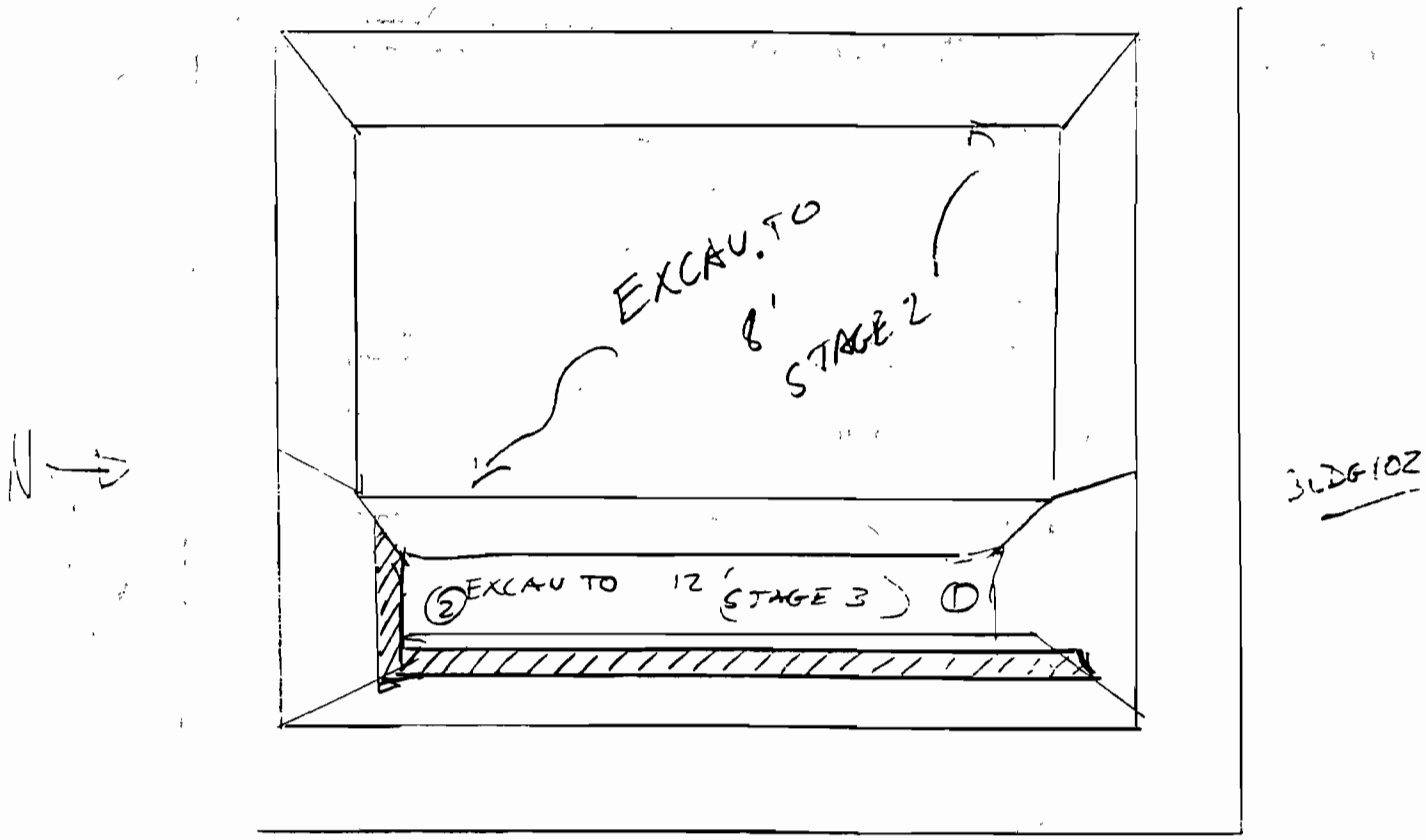


VERTICAL PROFILE. STAGE 2



REF	SAMPLE	HEADSPACE	LAB
1	0406	ND	NO
2	0607W	ND	YES
3	0607S	40	NO
4	1011 B	2	YES
5	0708 S	ND	YES
6	0708 SE	67	NO

HALLIBURTON NUS Environmental Corporation and Subsidiaries		STANDARD CALCULATION SHEET	
CLIENT: CTO 178	FILE NO.:	BY: PARKER	PAGE 3 OF 3
SUBJECT: TF 69		CHECKED BY:	DATE: 8/11/94



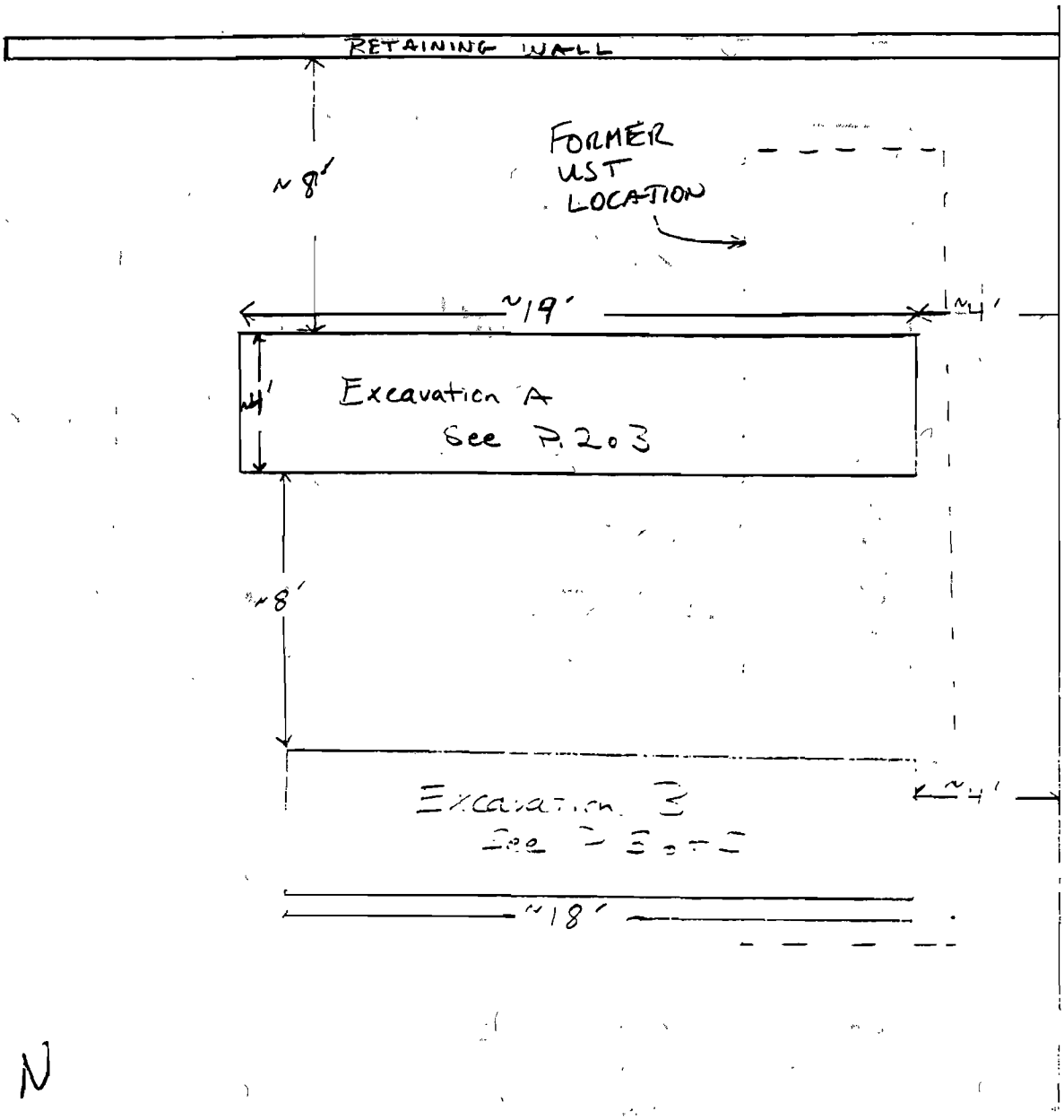
SLDG

REF	SAMPLE	HEADSPACE	+O
②	1112 E	>100	YES
③	1012 SE	>100	YES

▨ — VISUAL CONTAMINATION

HALLIBURTON NUS Environmental Corporation and Subsidiaries — **STANDARD CALCULATION SHEET**

CLIENT: CTO 178	FILE NO.:	BY: PADITR	PAGE 1 OF 3
SUBJECT: TP 70 NCBC DVL		CHECKED BY:	DATE: 8/12/94

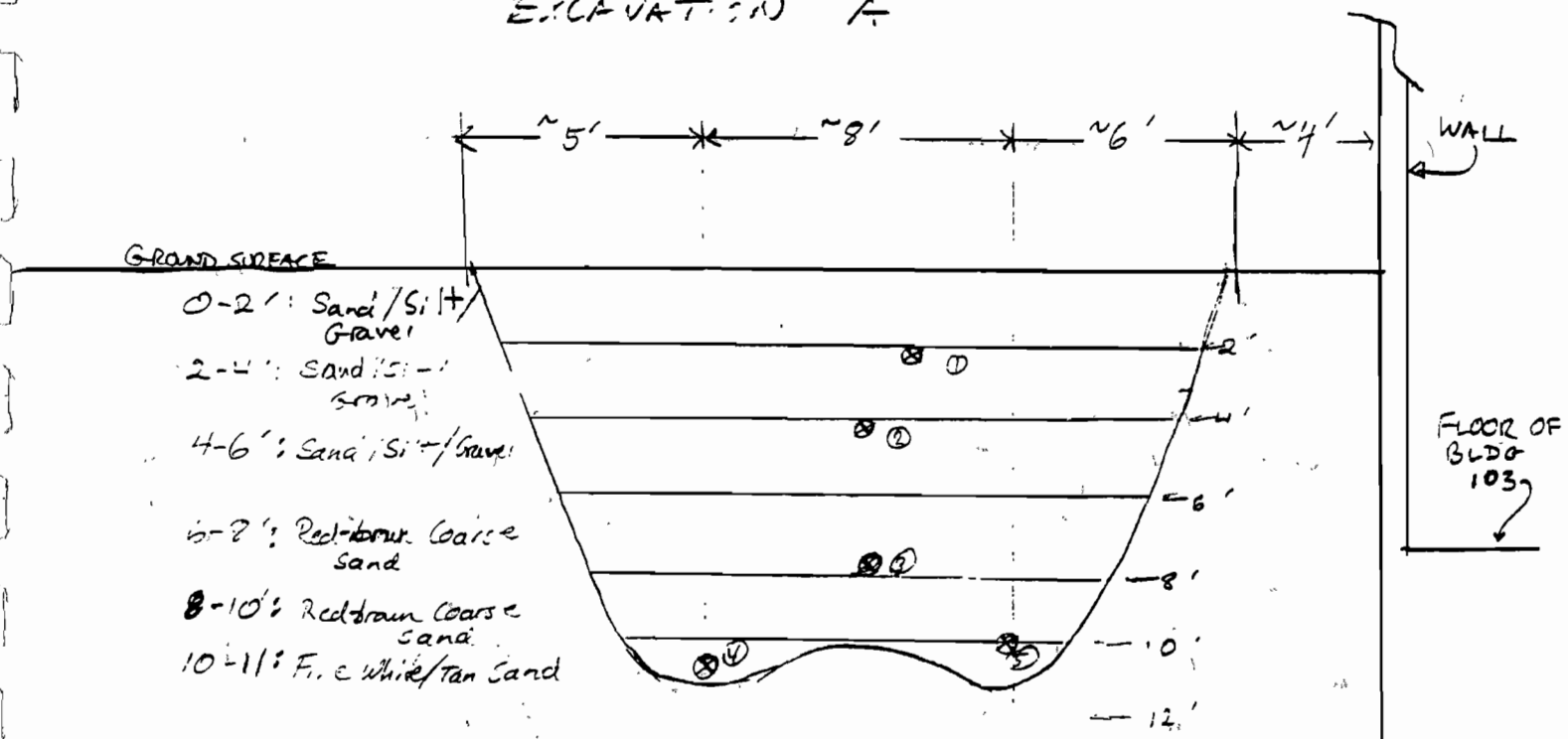


OVERHEAD VIEW

UST LOCATION FD

HALLIBURTON NUS Environmental Corporation and Subsidiaries			STANDARD CALCULATION SHEET
CLIENT: CTO178	FILE NO.:	BY: PARKER	PAGE 2 OF 3
SUBJECT: TP70 NCBC DVL		CHECKED BY:	DATE: 8/12/94

VERTICAL PROFILE:
EXCAVATION A

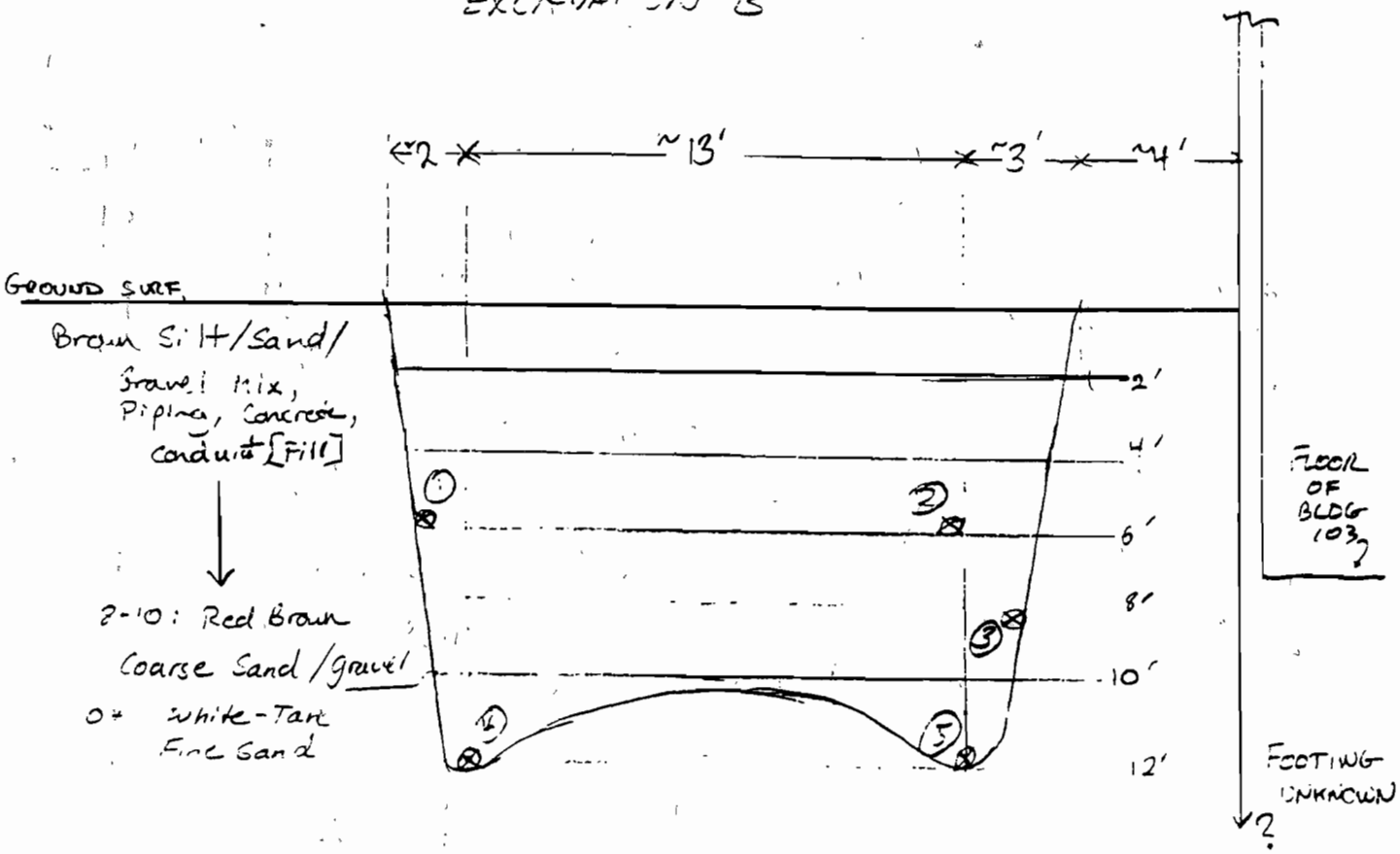


REF	Sample	Location	Sentinel
0	0203S	ND	
2	0405S	ND	
3	0708S	ND	
4	1011SE	ND	*
5	0910S	ND	*

HALLIBURTON NUS Environmental Corporation and Subsidiaries — STANDARD CALCULATION SHEET

CLIENT: CT0178	FILE NO.:	BY: PARKER	PAGE 3 OF 3
SUBJECT: PTO		CHECKED BY:	DATE: 9/12/94

VERTICAL PROFILE
EXCAVATION B



SEE	SAMPLE	HEADSPACE	LAB
1	0405 NE	ND	
2	0405 NW	ND	
3	0809 NW	ND	*
4	1112 NE	ND	*
5	1112 NW	ND	*

APPENDIX B

BORING LOGS

UST AREA A1

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST-3 DRILLED BY: C. STANAS BORING NO.: MW-7

DATE STARTED: 7/21/94 INCLINATION: Vertical LOGGED BY: T. DONEGAN GROUND ELEV.: NM

DATE COMPLETED: 7/21/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								STARTED @ 0830
	0							0002 N.S.
	2	SS-1	6,10 17,17	24	23	3-MW1-SB 0204 @ 0835		0204 SILTY SAND (SM) FINE SAND TRACE SILT. TRACE MED. SAND SLIGHT BEDDING. SMALL (1/2") OXIDIZED BLEBS. TAN.
						Ø PPM		
	4	SS-2	16,14 22,23	24	16	3-MW1-SB 0406 @ 0840		0406 ~~SP~~ SAND (SP) FINE SAND TRACE MED. SAND. 1 PIECE GRAVEL ~1"/LONG SUB ANGULAR. SEDS AR LIGHT TAN.
	6	SS-3	26,26 18,17	24	18	3-MW1-SB 0608 @ 0844		0608 SIMILAR TO ABOVE, LESS FINE MOSTLY MED. SAND SOME FINE SAND. SOME X-BEDDING. ← LAYERS OF M.S. ~~GRAY~~.
	8	SS-4	12,15 10,13	24	12"	3-MW1-SB 0810 @ 0845		0810 SIMILAR TO ABOVE. NO STRUCTURE.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; blows per foot of rock coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:

34 @ 0850
45

SURFACE = ASPHALT ~ 2" THICK.

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-176 LOCATION: UST-3 DRILLED BY: C. STAMAR BORING NO.: MW-1

DATE STARTED: 7/21/94 INCLINATION: Vertical LOGGED BY: T. DORLAN GROUND ELEV.: NM

DATE COMPLETED: 7/21/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	10	SS-5	34 45	24	16	S-MW1-S5 1012 @ 0848 ▽ ~11-12'		1012 SIMILAR TO ABOVE. F.-MED SAND (POORLY GRADED) SOME ≮ BEDDING. VERY SLIGHT TAN. NO COARSE.
	12	SS-6	1,2 4,4	24	21	S-MW1-S5 1214 @ 0850		1214 SIMILAR TO ABOVE. FINING DOWN TOWARDS. MORE SOME LAYERS OF M.-COARSE SANDS.
	14	SS-7	1,1 2,3	24	22	S-MW1-S3 1416 @ 0855		1416 SIMILAR TO ABOVE. SILTY SAND GRADING IN TOWARDS THE MIDDLE OF SAMPLE.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

1/2/3 @ 0900

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST-3 DRILLED BY: C. STAMAR BORING NO.: MW-1

DATE STARTED: 7/21/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/21/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	16	SS8	1 1 23	24	24	3-MW1-SB 1618 @ 0903		1618 SIMILAR TO ABOVE. TRACE SILT & SLIGHT BEDDING IN LOWER 1/2. TAN
	18	SS-9	3,5 2,1	24		3-MW1-SB 1820 @ 0905		1820 SIMILAR TO ABOVE. LITTLE STRUCTURE, VERY SLIGHT BEDDING IN LOWER 1/2. F-MED SAND, POORLY GRADED TAN.
								EOH @ 20'

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST-3 DRILLED BY: C. STAMAK BORING NO.: R-1

DATE STARTED: 7/21/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/21/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							0002 - N.S. STARTED HERE @ ~0740
	2	SS-1	0,17 18,21	24	22"	3-B1-SB 0204 @ 0745		1A- 0204 - (SP) SAND, POORLY GRADED FREDOM. F.S. WITH SOME MED. SAND LIGHT TAN. SOME SLIGHT BEDDING. 1B- 1" LAYER @ 3-4" SAND (SW) MED.-COARSE SAND. BROWN
	4	SS-2	11,15 17,22	24	23"	3-B1-SB 0406 @ 0750		0406 2A- SILTY SAND (SM) MOSTLY F.S. WITH TRACE SILT OLIVE GREEN TO TAN. 2B- SIMILAR TO 1A ABOVE. HAS SOME BEDDING AND SMALL LAYERS OF C.S. ~1/4"
			13,15 17,12	24	20"	3-B1-SB 0608 @ 0755		0608 SIMILAR TO ABOVE. INTERMITENT C.S. LAYERS, MOSTLY M.S. WITH SOME FINES.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
SURFACE = ASPHALT = ~2" THICK @ 0400

5 1 8

455 76

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: 110-178 LOCATION: USI-3 DRILLED BY: C. STAMAS BORING NO.: R-1

DATE STARTED: 7/21/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: UM

DATE COMPLETED: 7/21/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 121

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	5,7 6,7	24	11	B-B1-SB 0810 @ 0800		0810 SIMILAR TO ABOVE @ 5-TO 6" NEARLY ALL C.S. SOME BEDDING, NO X-BEDDING TAN
	10	SS-5	65 76	24	24	B-B1-SB 1012 @ 0805		1012 SIMILAR TO ABOVE. 9" TO 11" = NEARLY ALL C.S. SLIGHTLY OXIDIZED SATURATED BELOW 11" FINING DOWNWARDS.
						▼ @ ~11-12'		

EOH @ 12'

BACKFILL

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▼ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG — **NUS CORPORATION**

PROJECT: OTO-178 LOCATION: UST-3 DRILLED BY: C. STAMOS BORING NO.: B-2

DATE STARTED: 7/21/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: N/M

DATE COMPLETED: 7/21/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								STARTED @ 0940
	0							0002- NS.
	2	SS-1	8,12 16,18	24	22	3-B2-SB 0204 @ 0948		0204 (3?) SAND FINE WITH SOME MED. SAND. SOME LAYERING, A NUMBER OF SILTY SAND LAYERS < 1" THICK. TAN WITH SOME GRAY
	4	SS-2	8 10 12 18	24	23	3-B2-SB 0406 @ 0955		0406 SIMILAR TO ABOVE. 2A- N10" SILTY SAND (SM) MOSTLY F.S. TRACE SILT. ~~GRAY~~ TAN 2B- 13" SAME AS (0204) SOME BEDDING.
	6	SS-3	18 18 16 15	24	~~16~~ 21	3-B2-SB 0608 @ 1000		0608 SIMILAR TO ABOVE. TRACE COARSE SAND ~~NEAR~~ TOP NICE BEDDING.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water table

NOTES:
SURFACE = ASPHALT ~ 2"-3" THICK.

45 46 6 1003

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: 170-178 LOCATION: UST-3 DRILLED BY: C. STAMAS BORING NO.: B-2

DATE STARTED: 7/21/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/21/94 BEARING: NM CHECKED BY: TOTAL DEPTH:

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	45 68	24	18	3-BZ-SB 0810 1005		0810 SIMILAR TO ABOVE NICE BEDDING. TRACE C.S. NEAR TOP.
						▽ ~10-11'		SATURATED
	10	SS-5	76 88	24	24	3-BZ-SB 1012 @ 1006		1012 SIMILAR TO ABOVE TAN. 2 OXIDIZED ZONES N 1" THICK - 1 @ 6" 2 @ NOSE.
								EOH @ 12'
								PUMPED GROUT TO FILL HOLE

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG:

NUSCO CORPORATION

PROJECT: CTC 178	LOCATION: Danville RI	DRILLED BY: EDI - S. Lamarch	BORING NO.: 5-B1
DATE STARTED: 7-13-94	INCLINATION: Vertical ?	LOGGED BY: K Jalkut	GROUND ELEV.: NM
DATE COMPLETED: 7-13-94	BEARING:	CHECKED BY:	TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								NO SAMPLE 0-2' NO ASHALT
1								
2								
3		S-1	2-2 3-3	24	7	5-B1-SB-0204 0937 hrs 0ppm		S-1 (7in) SAND tr. silt tr. gravel: Fine sand, tr. med sand poorly graded; fine subrounded gravel up to 1/2" in. length Brown. No stratification - potential fill material. (SP)
4								
5		S-2	2-3 3-3	24	4	5-B1-SB-0406 50ppm 0941 hrs		S-2 (4in) SAND tr. silt tr. gravel. Fine sand, poorly graded. Brown. (SP) coarse subrounded gravel up to 1in in length (2 pieces)
6								
7		S-3	2-4 3-4	24	5	5-B1-SB-0608 25ppm 0949 hrs		S-3 (5in) SAND. Fine sand poorly graded Stratified (SP). Tan
8								
9		S-4	6-6 7-9	24	6	5-B1-SB-0810 24 ppm 1012 hrs		S-4A (3in) SAND Fine sand poorly graded cross bedded Tan (SP)
10								S-4B (3in). SAND. Fine sand poorly graded Tan Not stratified. Red mineral prevalent in sand (SP)
11		S-5	7-7 10-11	24	0	5-B1-SB-1012 1039 hrs 0ppm		B end of spoon only slightly damp. No WT
12								EOB at 12' Hole collapsed. No backfill materials other than kicking in surrounding soil

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
Limited Access Drilling - Using Tripod Sampling Device
Continuous Sampling 2 - 12' w/ 2" barrel in 2' increments
No sample 0-2'
Jar Headspace Readings
Split-barrel advanced off-vertical

DATE: 7-13-94 PROJECT NO.: 1905
PAGE: 1 OF BORING NO.: 5-B1

BORING LOG

PROJECT: CTC 178	LOCATION: Davisville RI	DRILLED BY: EDI-S. Lamanch	BORING NO.: S-B2
DATE STARTED: 7-13-94	INCLINATION: OFF VERTICAL	LOGGED BY: K. Saikut	GROUND ELEV.: NM
DATE COMPLETED: 7-13-94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 10'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								NO SAMPLE 0-2' NO ASPHALT — DIRT
1								
2								S-1A (6in) SAND tr. silt tr. gravel. Fine sand, tr. med sand; poorly graded; fine subangular and subrounded gravel up to 1/2" in length. Brown. (SP). No stratification
3		S-1	2-3 3-4	24	19	S-B2-SB-0604 1054 hrs 0ppm		
4								S-1B (13in) SAND tr. silt tr. gravel. Fine to med sand poorly graded. Fine subrounded gravel up to 1/4" in length. Brown-grey. (SP)
5		S-2	7-8 9-12	24	14	S-B2-SB-0606 1103 hrs 4ppm		
6								
7		S-3	12-9 11-13	24	16	S-B2-SB-0608 1115 hrs 2ppm		S-2 (14in) Similar to S-1B (SP).
8								S-3A (8in) SAND tr. silt, some gravel. Fine sand tr. med sand poorly graded coarse subrounded gravel up to 1" in length, fine subrounded gravel up to 1/4" in length.
9		S-4	9-10 10-14	24	0	S-B2-SB-0810 0ppm 1200 hrs		S-3B (8in) Similar to S-2. (SP) Brown. Banded
10								
11								VOID
12								S-4 (0in) NO RECOVERY - PUSHED GRAVEL alternating grey brown layers (SP)

END OF BORING AT 10'
NO WATER TABLE OBSERVED
HOLE COLLAPSES & ADDITIONAL SAND ADDED

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN. - Penetration length of sample
REC. - Length of sample recovered
▽ - Natural ground water level

NOTES:
Limited Access Drilling - using Tripod Device
Continuous sampling 2' - 2" split barrel / 2' increments
Jar Headspace / Headamp

DATE: 7-13-94 PROJECT NO.: 1905
PAGE: 1 OF BORING NO.: S-B2

BORING LOG

PROJECT: CTO-178 LOCATION: UST-6 DRILLED BY: C. STAMAS BORING NO.: MW-1

DATE STARTED: 7/12/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/12/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							0002 - N.S.
	2	SS-1	5,6 7,7	24	16	6-MW1-SB 0204 @ 1220		0204 - SAME AS B1 + B2 SILTY FINE SAND (SM) MOSTLY FINE SAND WITH TRACE SILT + TRACE MED. SAND SUBARY TEXTURE SOME X-BEDDING. LIGHT TAN. DRY
	4	SS-2	5,9 10,11	24	18	6-MW1-SB 0406 @ 1230		0406 SAME AS ABOVE, DRY, NO X-BEDDING.
	6	SS-3	11,9 9,8	24	22	6-MW1-SB 0608 @ 1233		0608 3A - 3" SAME AS ABOVE TAN 3B - 5" SAME w/ X-BEDDING + DARKER TAN. 3C - 14" SILTY SAND (SM) MOSTLY FINE SAND WITH SOME M.S. & TRACE SILT. X-BEDDING

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:
15 9 8 @ 1244
9 11 5
15 15 1235
14 12
6 8 10 11 1240

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST 6 DRILLED BY: C. STAMAR BORING NO.: MW1

DATE STARTED: 7/12/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/12/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	15,15 14,12	24	16"	6-MW1-SB 0810 @ 1235		0810 SAME AS SS-1. HAS X-BEDDING. DAMP IN NECK 2 DROPSTONES ~1.5" DIAM ROUNDED.
	10	SS-5	6,8 10,11	24	21"	6-MW1-SB 1012 @ 1240		1012
						▽ ~10'		5A-16" SAME AS ABOVE, NO DROP STONES. 5B-SILTY SAND (SM) FINER THAN ABOVE. MOSTLY U.F. SAND + SOME SILT. STILL HAS DARK X-BEDDING TAN COLOR.
	12	SS-6	15,9 9,11	24	8"	6-MW1-SB 1214 @ 1244		1214 SATURATED 6A-9" SAME AS ABOVE. 6B-9" SAME AS SS-4. HAS GONE BACK TO COARSER SIZE (F.S., TRACE M.S.) TRACE SILT.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
3 4 6 15 1416 @ 1255
9 11 1114 - 1618 @ 1300
6 14 14 16 1620 1305

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178	LOCATION: TANK-6	DRILLED BY: C. STAMAS	BORING NO.: MW-1
DATE STARTED: 7/12/94	INCLINATION: Vertical	LOGGED BY: T. Dorgan	GROUND ELEV.: NM
DATE COMPLETED: 7/12/94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	14	SS-7	5,4 4,5	24	21	6-MW1-SB 1416 @ 1255		1416 SAME AS 6B. NO X-BEDDING TAN
	16	SS-8	9,11 11,14	24	24	6-MW1-SB 1614 @ 1300		1618 SAME AS ABOVE NO X-BEDDING TAN
	18	SS-9	8,14 14,18	24	24	6-MW1-SB 1820 @ 1305		1820 SAME AS ABOVE -FINING TWORDS BOTTOM. SOME SILT AS APPOSED TO TRACE. EOH @ 20'

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water level

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG:

PROJECT: ITO-178 LOCATION: LST-6 DRILLED BY: C. STAMMAE BORING NO.: B-1

DATE STARTED: 7/12/94 INCLINATION: Vertical LOGGED BY: T. J. ORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/12/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							0002 - NS.
	2	SS-1	10,13 14,18	24	24	6-B1-SB 0204 @ 1050		0204 SILTY SAND (SM) NEARLY ALL F.S.-V.F.S WITH TRACE SILT + TRACE M.S. TAN WITH CROSS BEDDING THROUGHOUT SLIGHT TEXTURE LIGHT TAN.
	4	SS-2	2,7 3,6	24	15	6-B1-SB 0406 @ 1100		0406 SAME AS ABOVE
	6	SS-3	5,6 14,15	24	16"	6-B1-SB 0608 @ 1102		0608 SAME AS ABOVE

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Z - Natural ground water table

NOTES:
20, 11 @ 0810
12, 12 @ 1107

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

PROJECT: CTO-178 LOCATION: UST-6 DRILLED BY: C. STAMAS BORING NO.: B-1

DATE STARTED: 7/12/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/12/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	20,11 12,12	24	20	G-B1-SB 0810 @ 1107		0810 SAME AS ABOVE, NO X-BEDDING.
	10	SS-5	21,19 15,18	24	21	G-B1-SB 1012 @ 1112		1012 ✓ SAME AS ABOVE, BUT X-BEDDING IS BACK. + GRAIN SIZE IS FINING DOWNWARD.
						▽ ~10.5' SPOON DRY IN UPPER 1/2 SATURATED IN BOTTOM (MOCE).		
								BH @ 12'

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

PROJECT: CTO-178	LOCATION: UST-6	DRILLED BY: A. STAMAS	BORING NO.: B-2
DATE STARTED: 7/12/94	INCLINATION: Vertical	LOGGED BY: T. DORGAN	GROUND ELEV.: NM
DATE COMPLETED: 7/12/94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							0002 N.S.
	2	SS-1	10,12 12,13	24	16	6-B2-SB 0204 @ 1140		0204 SILTY SAND (SM) SAME AS B1 (UST6) MOSTLY F.S. WITH TRACE SILT. TRACE M.S. X-BEDDING EVIDENT ~~#0~~ LIGHT TAN COLOR WITH DARK GRAY X-BEDDING. (SUGARY) TEXTURE
	4	SS-2	36 56	24	16	6-B2-SB 0406 @ 1144		0406 DRY. SAME AS ABOVE DRY
	6	SS-3	10,10 12,14	24	20	6-B2-SB 0604 @ 1150		SAME AS ABOVE DRY
	8	SS-4	24,22 22,14	24	24	6-B2-SB 0810 @ 1153		SAME AS ABOVE DAMP IN NOSE. FROM 5" TO 6" TRACE C.S.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; drilling time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
∇ - Natural ground water level

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

PROJECT: CTO-178	LOCATION: UST-6	DRILLED BY: C. STAMAR	BORING NO.: R-2
DATE STARTED: 7/12/94	INCLINATION: Vertical	LOGGED BY: T. DORGAN	GROUND ELEV.: NM
DATE COMPLETED: 7/12/94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	10	SS-5	10, 12 15, 11	24	20	6-BZ-SB 1012 @ 1200 ▽ ~10'		1012 SAME AS THE REST OF THE BORING. SATURATED WHERE SPOON. CROSS-BEDDING, MULTI-DIRECTIONAL + THROUGH-OUT WHOLE BORING.
								EOH @ 12' Ø PPM 0 → 12'

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive 4 split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG: **MUSCO CORPORATIONS**

PROJECT: 10179 LOCATION: Davisville RI DRILLED BY: EDI - S. LaMonch BORING NO.: 6-B1

DATE STARTED: 7-12-94 INCLINATION: Vertical LOGGED BY: K Jalkut GROUND ELEV.: 0m

DATE COMPLETED: 7-12-94 BEARING: CHECKED BY: TOTAL DEPTH: 20

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							ASPHALT NO SAMPLES 0-2'
	1							
	2							
	3	S-1	4-12 12-10	24	16	6-B1-SB-0204 1257 hrs 0ppm		S-1A (2in) SAND tr. silt. Fine/Med Sand poorly graded. Brown. (SP)
	4							S-1B (5in) SAND tr. gravel ~~tr. silt~~ Fine sand tr med sand poorly graded, fine subangular gravel (5 pieces) up to 1/4" in length. Tan (SP). Red in organic material
	5	S-2	2-3 3-3	24	11	6-B1-SB-0406 1303 hrs 0ppm		S-1C (9in) SAND Fine sand Poorly Graded Stratified. Tan (SP)
	6							S-2 (11in) SAND - similar to S-1C - stratified (SP)
2UP6	7	S-3	6-7 8-7	24	15	6-B1-SB-0608 1306 hrs 0ppm		S-3 (15in) SAND - similar to S-2; 1-inch thick band of stratification that is stained red-brown at 6-7" mark in sample. Tan (SP)
	8							
	9	S-4	5-6 6-7	24	15	6-B1-SB-0810 1309 hrs 0ppm		S-4 (15in) SAND - similar to S-3 w/ stratification but no prevalent band. (SP)
	10							
	11	S-5	3-2 2-3	24	16	6-B1-SB-1012 1318 hrs ▽ @ 11' 0ppm		S-5 (16in) SAND - Fine sand similar to S-4 - Cross stratified (SP) Tan
	12							
	13	S-6	3-2 2-3	24	17	6-B1-SB-1214 1318 hrs 0ppm		S-6 (17in) SAND tr gravel Fine sand trace med sand poorly graded, fine rounded to subrounded gravel or rock chips up to 1/4" in diameter. Dark tan. (SP). Some red mottling.
	14							
	15	S-7	2-2 3-4	24	19	6-B1-SB-1416 1322 hrs 0ppm		S-7A (8in) SAND Fine to med sand poorly graded. Dark tan. (SP)
	16							
No pit samples	17	S-8	3-2 4-4	24	19	6-B1-SB-1618 1326 hrs 0ppm		S-7B (11in) SAND Fine sand poorly graded Light tan (SP)
	18							
	19	S-9	2-2 2-3	24	17	6-B1-SB-1820 1340 hrs 0ppm		S-8 (19in) SAND - similar to S-7B (SP) except color Dark Tan
	20							S-9 (17in) SAND Fine sand poorly graded Light tan (SP)

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:
HSA 4 1/4" ID 8" OD
Cont. Sampling 2' to
Jar Headspace Readings
2' increments w/ 2" ID
split barrel

EOB at 20'. Backfilled w/ bent. slurry + sand to 2'. Sand to 0'.

DATE: 7-12-94 PROJECT NO.: 1905
PAGE: 1 OF BORING NO.: 6-B1

BORING LOG

PROJECT: CTO 177 LOCATION: Danville RT DRILLED BY: EDI - S. Lamarch BORING NO.: B2

DATE STARTED: 7-12-94 INCLINATION: Vertical LOGGED BY: K. Talkut GROUND ELEV.: NM

DATE COMPLETED: 7-12-94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							ASPHALT NO SAMPLE 0-2'
	1							
	2							
	3	S-1	3-3 3-4	24	17	G-B2-SB-0204 1433 hrs 5 ppm		S-1A (7in) SAND fr gravel; Fine sand poorly graded, fine subrounded gravel up to 1/8". Brown (SP)
	4							S-1B (10in) SAND. Fine sand poorly graded Light Tan (SP). No banding u.s.c.s.
	5	S-2	6-5 7-8	24	10	G-B2-SB-0406 1437 hrs 5 ppm		S-2 (10in) SAND Fine sand - banded - Similar (w/ exception of banding) to S-1B. Light tan (SP). ≡ - dark minerals
	6							
	7	S-3	6-7 7-8	24	14	G-B2-SB-0608 1439 hrs 50 ppm		S-3 (14in) SAND - similar to S-2 w/o banding. (SP)
	8							
	9	S-4	2-2 2-2	24	12	G-B2-SB-0810 1446 hrs 35 ppm		S-4 (12in) SAND - similar to S-3 w/ some banding; red mineral prevalent. Poorly graded (SP) Light tan
	10							
	11	S-5	2-2 2-2	24	18	G-B2-SB-1012 1447 hrs @ 10-11' 10 ppm		S-5 (18in) SAND - Fine sand poorly graded wet at 10.5'; Reddish mottling at 11'-11.5' (6 inch band) (SP).
	12							EOB @ 12' Backfilled w/ bent slurry + sand to 2'; sand to 1'; asphalt patch.
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							

VOID

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water level

NOTES:

~~Cont sampling~~

HSA 4 1/4" ID 8" OD
Jar Headspace Technique
2' increments w/ 2" ID split barrel

No readings ~~Breathing~~ zone
Cont. sampling 2'

DATE: 7-12-94 PROJECT NO.: 1905
PAGE: 1 OF 1 BORING NO.: B2

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST-11-[illegible] DRILLED BY: C. STAMMAS BORING NO.: MW-1

DATE STARTED: 7/12/94 INCLINATION: Vertical LOGGED BY: T. DORSAN GROUND ELEV.: NM

DATE COMPLETED: 7/13/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							0002
	2	SS-1	2,3 2,2	24	13	11-[illegible]-MW1-SB 0204 @ 1450		0204 SAND (SW) V.F.-M.S. WITH SOME 1A - 8" FILE GRAIN - ROUNDED - TAN-BRO. 1B - 5" - SILTY SAND (SM) - MOSTLY V.F. SAND WITH SOME SILT. DK. BROWN
	4	SS-2	1,1 7,3	24	12	11-[illegible]-MW1-SB 0406 @ 1455		0406 SAME AS ABOVE (1B) BUT WITH ROOTS & ORGANICS. DARK.
	6	SS-3	6,5 4,4	24	18	11-[illegible]-MW1-SB 0608 @ 1500		0608 3A-11" SAME AS ABOVE 3B-7" SILTY SAND (SM) MOSTLY V.F.S. WITH TRACE SILT. X-BEDDING LIGHT TAN. SIMILAR TO UST. #6

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; Coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
Z - Natural ground water table

NOTES: 1,2,5 / 4,4 @ 0940 / 1303 — 1,2 / 2,3 @ 1012 / 1507 — 2,2 / 2,3 @ 1214 / 1310

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: 11-~~02~~ UST DRILLED BY: C. STAMPS BORING NO.: MW 1

DATE STARTED: 7/12/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/13/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	12,5 4,4	24	1"	11-~~02~~-MW1-SB 0810 @ 1503		0810 POOR RECOVERY, ROCK IN NOSE? 1" = SAME AS ABOVE NO ~~HGAD~~ ~~SPACE~~ OR VOA.
	10	SS-5	1,2 2,3	24"	18"	11-~~02~~-MW1-SB 1012 1307		1012 SAME AS ABOVE SILTY FINE SAND (SM) MOSTLY U.F.S. WITH TRACE SILT. NO X-BEDDING DAMP IN NOSE
						▽ ~ 12'		
	12	SS-6	2,2 2,3	24	18"	11-~~02~~-MW1-SB 1214 1310 >1000 ppm		1214 SATURATED. SAME AS ABOVE

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; Coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG — **NUS CORPORATION**

PROJECT: CTO-178 LOCATION: UST 11-RR DRILLED BY: L. STAMAS BORING NO.: MW1

DATE STARTED: 7/12/94 INCLINATION: Vertical LOGGED BY: T. DURGAN GROUND ELEV.: NM

DATE COMPLETED: 7/13/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	14	SS-7	1 Bow 1/2'	24	18	11-MW1-SB 1416 @ 0828		1416 ~~SOME A~~ SIMILAR TO ABOVE. NO X-BEDDING.
	16	SS-8	34 7, 7	24	24	11-MW1-SB 1618 @ 0830		1616 SIMILAR TO ABOVE.
	18	SS-9		24		11-MW1-SB 1820 @ 0833		1820 SIMILAR TO ABOVE NO X-BEDDING. 1 1/4" ROUNDED PEBBLE-BLACK. EOH @ 20'

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
Ⅴ - Natural ground water level

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG — **NUS CORPORATION**

PROJECT: OTO-178 LOCATION: UST 11-22 DRILLED BY: C. STAMAS BORING NO.: MW2

DATE STARTED: 7/13/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/13/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							0002 - N.S.
	2	SS-1	56 75	24	1'	11-MW2-SB 0204 @ @ 1000		0204 Rock Recov. Rock in Noso SAND (SW) Mostly M.S. with trace silt trace F.S. some F. Gravel + organics. Brown. Head space only No VOA no TPH
	4	SS-2	4,5 10,9	24	15"	MW2-SB 0406 @ 1005		0406 Similar to above, with some fine gravel (sub-rounded) + no organics.
	6	SS3	11,12 12,13	24	1"	11-MW2-SB 0608 @ 1010		0608 Head space only - No VOA or TPH Similar to above.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Z - Natural ground water level

NOTES:
~~1112 68 1215 @ 1010~~
0810
7/11 1015
14/43

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: 170-178 LOCATION: UST-11-22 DRILLED BY: C. STAMAK BORING NO.: MW-2

DATE STARTED: 7/13/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/13/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	2,11 14,14	24	14	11-MW-2-SB 0810 @ 1015		0810 4A - 3" SIMILAR TO ABOVE 4B - 11" SIMILAR TO UST 6 SILTY SAND (SM) MOSTLY V.F.S. WITH TRACE SILT & TRACE-SOME M.S. VERY LIGHT TAN. FINING OUT DOWNWARDS. X-BEDDING IN NOSE. STILL DRY, ALTHOUGH DAMP IN NOSE
	10	SS-5	10,11 12,14	24	15"	11-MW2-SB 1012 @ 1030		1012 SIMILAR TO 4B. ABOVE. BANDING (DARK LAYERS) & LITTLE X-BEDDING. WET, BUT NOT SATURATED.
						▽ 11-12'		
	12	SS-6	10,11 12,12	24	19"	11-MW2-SB 1214 @ 1035		1214 SATURATED SIMILAR TO ABOVE
	14	SS-7	1 FOR 24"	24"	12"	11-MW2-SB 1416 @ 1040		1416 SIMILAR TO ABOVE.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG — **NUS CORPORATION**

PROJECT: WTO-178 LOCATION: UST-11-22 DRILLED BY: C. STAMAS BORING NO.: MW2

DATE STARTED: 7/13/94 INCLINATION: Vertical LOGGED BY: T. Dorsman GROUND ELEV.: NM

DATE COMPLETED: 7/13/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	16	SS8	4,6 10,14	24		11-MW2-SB 1618 @ 1043		1618 SIMILAR TO ABOVE 2 DROPSTONES (SUBROUND) ~1/2" DIAM.
	18	SS9		24		11-MW2-SB 1820 @ 1048		1820 SIMILAR TO ABOVE. SOME BANDING, NO X BEDDING.
								EOH @ 20'

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST-11-22 DRILLED BY: C. STAMAS BORING NO.: MW-3

DATE STARTED: 7/13/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/14/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0		45					0002 N.S.
	2	SS-1	1,1 0	24	Ø	11-MW3-SB 0204 @ 11:40 -		0204 NO RECOVERY
						11:50 - "SAFETY SALLY" LEAVES SITE		
	4	SS-2	7,9 10,12	24	18"	11-MW3-SB 0406 @ 11:50		0406 SILTY SAND (SM) MOSTLY F.S. WITH TRACE SILT + SOME M.S. SOME X-BEDDING IN NOSE. DRY.
	6	SS-3	12,8 10,6	24	19"	11-MW3-SB 0608 1155		0608 SIMILAR TO ABOVE, WITH X-BEDDING THRU-OUT. DRY. ONLY TRACE M.S.
	8	SS-4	10,8 7,7	24	21"	11-MW3-SB 0810 @ 1200	4A	0810 5" SAME AS ABOVE. (SOME GOLDEN YELLOW LAYERS ALONG WITH BLACK X BEDDING. 4B-4" SILTY SAND (SM) V.F.S WITH SOME SILT. X-BEDDING. GREY WITH BROWN + TAN + BLACK LAYERS.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN. - Penetration length of sample
REC. - Length of sample recovered
▽ - Natural ground water level

NOTES: NO TPH OR VOA SAMPLES FOR SAMPLES WITH 0 PPM IN HEAD SPACE. SEE 7/13/94

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST-11-22 DRILLED BY: C. STAMAS BORING NO.: MW-3

DATE STARTED: 7/13/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7-14-94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	10	SS-5	6,6 7,5	24	11"	11-MW3-SB 1012 @ 1205		1012 SILTY SAND (SM) MOSTLY F.S. WITH TRACE-SOME SILT. TRACE M.S. X-BEDDING TAN-BROWN.
						▽ ~11-12'		MOIST IN NOSE STRONG OIL ODOR
	12	SS-6	6,5 7,5	24	19"	11-MW3-SB 1214 @ 1210 >1000 PPM		1214 SATURATED SILTY SAND (SP) (SM) MOSTLY M.S. WITH SOME F.S. + TRACE SILT. STRONG OILY ODOR. NO X-BEDDING.
						SHUT DOWN @ ~1215 OR 1220. BY PORT AUTHORITY. NO DIGSAFE #! START-UP @ 7/14/94 @ 0745.		
	14	SS-7	1,2 4,7	24	20"	11-MW3-SB 1416 @ 0750		1416 ~~SAME AS~~ SIMILAR TO ABOVE, ~~NO MORE~~ ODOR NOT AS STRONG.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

6,7 7,6

3366

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: ITO-178 LOCATION: UST-11-22 DRILLED BY: C. STAMAS BORING NO.: MW-3

DATE STARTED: 7/13/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/14/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	16	SS-6	6, 7, 7, 6	24	24	11-MW3-SB 1614 @ 0753		1614 SIMILAR TO ABOVE. NO X-BEDDING. SLIGHT ODOR TAN OVER GRAY.
	18	SS-9	3 3 6 6	24		11-MW3-SB 1620 @ 0755		1620 STRONG OILY ODOR SIMILAR TO ABOVE. 1 1/4" DROPSTONE FOUND. (ROUNDED). TAN + GRAY. SLIGHT FINING DOWNWARDS.

EOH @ 20'

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: 170-178 LOCATION: TANK 11 DRILLED BY: C. STAMAE BORING NO.: B-1

DATE STARTED: 7/13/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/13/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 14'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							0002 N.S.
	2	SS-1	5,5 4,4	24	1"	11-B1-SB 0204 @ 0940		0204 NO TPH OR VOA ROCK IN NOSE ONLY HEAD SPACE 100 PPM SAND (SP) U.F. SAND WITH TRACE M.S. ORGANICS. BROWN.
	4	SS-2	1,1 1,1	24	10"	11-B1-SB 0406 @ 0916		0406 SIMILAR TO ABOVE, MOSTLY F.S. WITH TRACE - SOME MED. SAND TRACE FINE GRAVEL SUB-ROUND. BROWN WITH ORGANICS.
	6	SS-3	3,3 3,4	24	16"	11-B1-SB 0608 @ 0920		0608 3A - 3" SILTY SAND (SM) MOSTLY F.S. TRACE SILT TRACE C.S. TAN 3B - 13" SAND (SW) MOSTLY M.S. WITH TRACE F.G. + SOME F. GRAVEL SUB ROUND. BROWN

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water table

NOTES:

4 5 0925
7 10 0610

6 10 0912
14 14 0930

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO 178 LOCATION: TANK 11-22 DRILLED BY: EDI - C. Stamas BORING NO.: B-1

DATE STARTED: 7/13 INCLINATION: Vertical LOGGED BY: J. Dorgan GROUND ELEV.: NM

DATE COMPLETED: 7/13 BEARING: NM CHECKED BY: TOTAL DEPTH: 14'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	4	SS4	45 7 10	24	12"	11-B1-SB 0810 @ 0925		0810 POOR RECOVERY. DRY STILL 4A-SILTY SAND (SM) 4" MOSTLY M.S. WITH TRACE SILT + TRACE F.S. TAN. 4B-8" SILTY SAND (SM) MOSTLY F.S. TO V.F.S. WITH TRACE SILT, LIGHT TAN WITH X-BEDDING.
	10	SS5	6,40 14,14	24	24	11-B1-SB 1012 @ 0930 ▽ ~11'		SILTY SAND SIM. TO ABOVE. WET IN MIDDLE OF SPOON. SATURATED AT NOSE
			7 15 15 14			11-B1-SB 1214 @ 0940		SIM. TO ABOVE EOH @ 14'

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG — **NUS CORPORATION**

PROJECT: CTO 178 | LOCATION: Davisville RI | DRILLED BY: EDI - S. Camarche | BORING NO.: 11-B2

DATE STARTED: 7-21-94 | INCLINATION: Vertical | LOGGED BY: K. Jaikut | GROUND ELEV.: NM

DATE COMPLETED: 7-21-94 | BEARING: NM | CHECKED BY: | TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.		BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0								NO ASPHALT NO SAMPLE 0-2'
	1								
	2								S-1A (3in). SILTY SAND tr gravel. F/m sand poorly graded. fine subrounded gravel up to 1/4" in length. Dark brown. Grass roots. (SM)
DJ	3	S-1	X	3-4 4-6	24	17	11-B2-SB-0204 0ppm 1534 hrs		S-1B (14in) SAND ~~tr. silt~~ Fine sand poorly graded. Stratified. Darker minerals in bands. Bands 1/8 in thick not throughout interval. (SP) Light beige like sugar in coloration.
	4								
DJ	5	S-2	X	2-2 3-3	24	13	11-B2-SB-0406 0ppm 1539 hrs		S-2 (13in) SAND Fine sand - similar to S-1B. Cross bedding visible and stratification. (SP) Light beige
DJ	6								
Sample dupl.	7	S-3	X	4-2 3-4	24	22	11-B2-SB-0608 0ppm 1542 hrs		S-3 (22in) SAND Fine sand light beige w/ oxidized bands - 1/4" thick thin bedding - laminar ~~very fine~~ darker minerals. (SP) Poorly graded.
~~Sample~~	8								
	9	S-4	X	4-5 4-4	24	12	11-B2-SB-0810 0ppm 1548		S-4 (12in) SAND - No visible cross bedding but otherwise similar to S-3. (SP) ~~Hydrocarbon~~
	10								
sample	11	S-5	X	2-2 2-3	24	15	11-B2-SB-1012 ▽=11' 850ppm 1554 Petroleum odor		S-5 (15in) SAND ~~tr silt~~. Fine sand poorly graded. ~~Interbeds of silt.~~ Saturated at 11'. Similar to S-3 w/ stratification
	12								
	13	S-6	X	2-2 1-2	24	16	11-B2-SB-1214 400ppm 1603 hrs		S-6 (16in) SAND tr. silt. Fine sand poorly graded. Stratification visible. Dark beige (wet). Petroleum odor. (SP) Interbeds of silt (1/8" thick)
	14								
	15	S-7	X	1-1 1-2	24	19	11-B2-SB-1416 200ppm 1609 hrs		S-7 (19in) SAND tr. silt. v. minimal clay. Fine sand poorly graded. Tr. red sand. Petroleum odor. No stratification visible (SP)
	16								
	17	S-8	X	2-2 2-2	24	20	11-B2-SB-1618 180ppm 1614 hrs		S-8 (20in) SAND tr. silt. clay. Fine sand poorly graded. Beige (dark beige) with a black colored interval. Black (SP) Petroleum odor.
	18								
sample	19	S-9	X	2-2 2-1	24	18	11-B2-SB-1820 50ppm 1621 hrs		
	20								

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
4x20 Rig 2 man leaves
HSA 4¼" ID 8" OD
for Headspace readings
2' increment and w/barrel (2" ID)

DATE: 7-21-94 | PROJECT NO.: 1905
PAGE: 1 OF 2 | BORING NO.: 11-B2

BORING LOG

NUS CORPORATION

PROJECT: CTO 178 LOCATION: Dawsonville ILF DRILLED BY: EDJ-S. Lamoreke BORING NO.: 11-B2

DATE STARTED: 7-21-94 INCLINATION: Vertical LOGGED BY: K. Jalkut GROUND ELEV.: NM

DATE COMPLETED: 7-22-94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								S-9 (18 in) sand tr silt. fine sand poorly graded. Stratification not obvious
								7/21 EOB at 20'.
								7/22 Backfill —

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
∇ - Natural ground water table

NOTES:

See page 1

DATE: 7-22-94 PROJECT NO.: 1905
PAGE: 2 OF 2 BORING NO.: 11-B2

UST AREA B

BORING LOG

PROJECT: CTO-178	LOCATION: ANK 56	DRILLED BY: C. STAMM	BORING NO.: MW-1
DATE STARTED: 7-11-94	INCLINATION:	LOGGED BY: T. DORAN	GROUND ELEV.: NM
DATE COMPLETED: 7-11-94	BEARING:	CHECKED BY:	TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							0002 - NO SAMPLE
	2	SS-1	5,11 7,10	24	6	56-MW1-SB 0204 @ 1425 0 PPM		0204 - SILTY SAND (SM) MOSTLY F.S. TRACE SILT, TRACE ~~F~~ C.S. NO STRUCTURE. SOME ROOTS BROWN + TAN
	4	SS-2	2,2 1	24	24	56-MW1-SB 0406 @ 1430		0406 SAME AS ABOVE, BROWN FOR 12" TAN FOR 12" ▽ ~6.7'
	6	SS-3	1/24"	24	6	56-MW1-SB 0608 @ 1435		0608 3A - 11" SAME AS ABOVE, BROWN OVER TAN. 3B - 5" ORGANIC RICH SILTY SAND MOSTLY F.S. TRACE SILT MANY ROOTS + WOOD. DARK BROWN.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN. - Penetration length of sample
REC. - Length of sample recovered
▽ - Water ground water level

NOTES:
1 = 24" 1435 0608
0 12 0810 1213 @ 1440
10 12 1424 1445

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG — **NUS CORPORATION**

PROJECT: 070-178 LOCATION: TANK 56 DRILLED BY: C. STAMA BORING NO.: MW1

DATE STARTED: 7-11-94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7-11-94 BEARING: CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	6,12 12,13	24	16	56-MW1-SB 0810 @ 1440		0810 4A - 3" SILTY SAND (SM) MOSTLY F.S. WITH TRACE M.S. + TRACE SILT. 1-1.5" DIAM GRAVEL. TAN
						JUA @ HOLE 10-20 PPM		4B - 5" SILTY SAND (SM) PEAT LIKE. LOTS OF ROOTS + WOOD. MOSTLY F.S. WITH TRACE SILT. DARK BROWN 4C - 4" SILTY SAND (SM) MUCH LESS ORG. THAN 4B SAME GRAIN SIZE, BUT GREY IN COLOR. 4D - 4" SAND (SW) MOSTLY M.S. WITH SOME F.S. + DARK GREY. PEBBLE ~ 1.5" DIAM.
	10	SS-5	10,12 18,24	24	6	56-MW1-SB 1012 @ 1445		1012 SAND (SW) MOSTLY M.S. WITH SOME C.S. + TRACE F.S. TRACE GRAVEL UP TO 2" DIAM + ROCK FRAGS.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC. - Length of sample recovered
▽ - Natural ground water level

NOTES: ~ 1-2' BELOW GRDSURF. FROM B-1.

7 24 67,36 } 1416 @ 1500
13 14 37,33

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUMBER/DESIGNATION:

PROJECT: CTO-17CL LOCATION: TANK 56 DRILLED BY: C. STAMAR BORING NO.: MW1

DATE STARTED: 7-11-94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7-11-94 BEARING: CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	12	SS-6	17,24 13,14	24	24	56-MW1-SB 1214 @ 1450	6A-	6A 9" SAME AS ABOVE.
						DUP 5	6B-	6B 9" SAME COMPOSITION AS ABOVE, BUT IS OXIDIZED ORANGE SEPARATED FROM 6A BY 1/4" WIDE BLACK BAND
	14	SS-7	67,36 37,33	24	19	56-MW1-SB 1416 @ 1500		1416 7A 9" SAND (SP) MOSTLY M.S.-C.S. WITH TRACE F.S. TAN. NO ORG. NO STRUCTURE.
								7B 10" SILTY FINE SAND (SM). MOSTLY F.S. WITH TRACE SILT & TRACE GRAVEL SUB-ROUNDED UP TO 1" DIAM. GREY.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water level

NOTES:
15 47
51, 50
19,45
45,40

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: TANK 56 DRILLED BY: C. STAMMS BORING NO.: MW1

DATE STARTED: 7-11-94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: N/M

DATE COMPLETED: 7-11-94 BEARING: CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	16	SS-8	45,47 51,50	24	24	56-MW1-SB 1618 @ 1510		1618 SILTY SAND (SM) MOSTLY F.S. TRACE SILT + SOME GRAVEL + ROCK FRAGS - (SUBANGULAR - SUB ROUND) TAN OVER GREY.
	18	SS-9	49,45 45,40	24	6	56-MW1-SB 1820 @ 1515		1820 SAME AS ABOVE, POOR RECOV. DUE TO ROCK IN NOSE.
								(EOH @ 20')

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer
blows 30" to drive
a split barrel sampler;
coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.: MW1

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: TANK 56 DRILLED BY: C. STAMAS BORING NO.: B1

DATE STARTED: 7/11/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/11/94 BEARING: CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								0002 - NO SAMP.
	2	SS-1	1,2 / 1,2	24	15	56-B1-SB 0204 @ 1300		0204 SILTY SAND (SM) MOSTLY FINES WITH SOME SILT + A FEW ROUNDED FINE GRAVEL. POORLY GRADED. BROWN. MOIST NEAR NOSE.
						0 ppm		
	4	SS-2		24	10	56-B1-SB 0406 @ 1305		0406 2A - 5" - SAME AS ABOVE PEBBLE ~2" ROUNDED 2B - 5" - SILTY SAND (SM) MOSTLY FI WITH TRACE SILT. ALT. BANDS BROWN + TAN. MOIST THRU-OU
						0 ppm		
		▽ ~6'						
	6	SS-3	1,1	24	18	56-B1-SB 0608 @ 13:08		0606 SAME AS 2B. FOR 5" THEN SAME GRAIN SIZE, BUT COLOR IS GREY (FULLY SATURATED)
						20 ppm		

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer using 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:
<1.3 0810
120/5"

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178	LOCATION: TANK 56	DRILLED BY: C. SAMAS	BORING NO.: B1
DATE STARTED: 7/11/94	INCLINATION:	LOGGED BY: T. DORGAN	GROUND ELEV.: NM
DATE COMPLETED: 7/11/94	BEARING:	CHECKED BY:	TOTAL DEPTH: 20'

ELEV feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	2	SS-4	2/3 20/5"	24	15	56-B1-SB 0810 @ 1320 >1000PPM		0810 4A - 5" SILTY SAND (SM) WITH ORGANICS MOSTLY FINE SAND WITH SOME SILT
						1330 OVA = 20-40PPM @ HOLE		
								& TRACE FINE GRAVEL. GREY 4B - 4" SILTY FINE SAND (SM) LOTS OF ROOTS + WOODY PIECES MOSTLY FINE SAND WITH TRACE SILT. BROWN. 4C - 3" SILTY FINE SAND. (SM) NO ORGANICS, GREY. MOSTLY FINE SAND WITH TRACE SILT. 4D - 3" SAND (SP) MOSTLY MED. SAND WITH SOME F.S. GREY
	10	SS-5	3,4 1,8	24	0	56-B1-SB 1012 @ 1334		1012 5A - 9" SILTY SAND (SM) MOSTLY FINE SAND WITH ~~TRACE~~ SOME SILT. LONG GRASS FIBRES RUNNING LONGITUDINALLY THRU SAMPLE. ORGANICS. BROWN-GREY 5B - 7" SILTY SAND (SM) MOSTLY M.S. WITH SOME F.S. + TRACE SILT. GREY NO ORGANICS

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES: 26, 19, 13 — 11, 16 — 14, 19 — 20, 24 — 340

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

PROJECT: CTO-176	LOCATION: TANK 56	DRILLED BY: C. STAMAS	BORING NO.: B1
DATE STARTED: 2/11/94	INCLINATION:	LOGGED BY: T. DORGAN	GROUND ELEV.: NM
DATE COMPLETED: 2/11/94	BEARING:	CHECKED BY:	TOTAL DEPTH: 20

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	12	SS-6	28,32 11,16	24	24	56-B1-SB 1214 @ 1338 400 PPM		1214 SAND (SW) MOSTLY M.S. WITH SOME F.S. & TRACE C.S. ROCK FRAGS IN MIDDLE AREA OF SPOON ORGANICS THRU-OUT. DARK GREY
	14	SS-7	14,19 20,24			56-B1-SB 1416 @ 1340 350 PPM		1416 SAME AS ABOVE, NO ROCK FRAGS, SOME FINE GRAVEL. - ROUNDED. DARK GREY
	16	SS-8	11,21 24,30	24		56-B1-SB 1618 @ 1345 500 PPM		1618 SAME AS ABOVE WITH INTERMITTENT 1" LAYERS OF SILTY FINE SAND. MOSTLY F.S. W/TRACE SILT. DARK GREY.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; drilling time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
∇ - Natural ground water table

NOTES:

11 21 - 1618
24 30

28 26 - 1820
14 16

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

DRILL LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: TANK 56 DRILLED BY: C. STAMAS BORING NO.: B1

DATE STARTED: 7/11/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/11/94 BEARING: CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	18	SS-9	28,20 18,16	24	24	56-M1-SB 1820 @ 1350		1820 18" 9A- SAND (SP) MOSTLY M.S. WITH SOME C.S. & TRACE F.S. TRACE FINE GRAVEL (SUB-ROUNDED) GREY. 9B- 6" SILTY FINE SAND (SM) MOSTLY F.S. WITH TRACE SILT. No STRUCTURE OR ORGANICS. TAN + GREY MIXED. EOH @ 20'

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG: NUS CORPORATION

PROJECT: CTO-178	LOCATION: UST-56	DRILLED BY: C. STANAR	BORING NO.: B-2
DATE STARTED: 7/12/94	INCLINATION: Vertical	LOGGED BY: T. DORGAN	GROUND ELEV.: NM
DATE COMPLETED: 7/12/94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 14'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							0002 - NO SAMPLE
	2	SS-1	7,9 / 11,6	24"	16"	56-B2-SB 0204 @ 0750		0204 - SAND (SW) MOSTLY M.S. WITH SOME F.S. + TRACE C.S.-F. GRAVEL SOME SURF. ROUNDED GRAVEL. SOME ORGANICS.
	4	SS-2	2,3 / 5,2	24"	9"	56-B2-SB 0406 @ 0758		0406 2A - 3" SAME AS ABOVE. 2B - 6" SILTY SAND (SM) MOSTLY F.S. WITH TRACE SILT. WELL ROUNDED TRACE F. GRAVEL. SOME ORGANICS SATURATED
						▽ ~6' H_2O IN HOLE		
	6	SS-3	2,2 / 4,13	24	4"	56-B2-SB 0608 @ 0800		0608 SAME AS ABOVE, BUT SATURATED
	8	SS-4	11,19 / 33,30	24"	24"	56-B2-SB 0810 @ 0805		0810 4A - 9" SAND (SW) MOSTLY M.S. WITH TRACE F.S. + SOME F. GRAVEL - SUBROUND ORGANICS - DARK GRE 4B 15" SAND (SP) NEARLY ALL M.S. TRACE F.S. TRACE F. GRAVEL NEAR NOSE TAN - ORANGE

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; or, drilling time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES: 2,2,4,13 - 68 @ 0800
11 19 33 30 - 0810 0805
13 24 24 20 1012 @ 0815

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: TANK-56 DRILLED BY: C. STAMAS BORING NO.: B-2

DATE STARTED: 7/12/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/12/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 24

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	10	SS-5	13 24 24 20	24	20"	56-B2-SB 1012 @ 0815		1012 SAND (SW) MOSTLY M.S. TRACE F.S. TRACE C.S. & TRACE GRAVEL (SUB-ROUNDED). TAN TO ORANGE COARSER TO BOTTOM. NO ORGANICS
	12	SS-6	29,33 29,21	24		56-B2-SB 1214 @ 0830		0835 - GROUND SCREW DRIVES BY. 1214 SAND (SW) MOSTLY M.S. WITH TRACE F.S. TRACE C.S & TRACE F. GRAVEL (SUB-ROUND) NEAR BOTTOM. BROWN. NO ORGANICS

EOH @ 14'

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30". to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Ⅴ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
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BORING LOG

NUS CORPORATION

PROJECT: TO-178	LOCATION: TANK 58	DRILLED BY: C. STAMAR	BORING NO.: MW-1
DATE STARTED: 7/11/94	INCLINATION:	LOGGED BY: T. DORGAN	GROUND ELEV.: NM
DATE COMPLETED: 7/11/94	BEARING:	CHECKED BY:	TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								0002 - NO SAMPLE START DRILL
		2SS-1	20, 17, 17, 18	24	12	~~AND~~ 58-MW1-SB 0204 @ 0915		0912 0204 1A - 1" SILTY FINE SAND (SM), MOSTLY FINES, WITH ORGANICS (ROOTS) SOME SILT + TRACE MED SAND. BROWN - (LOAM). 1B - 11" SAND (SP) MOSTLY FINE SAND WITH TRACE - SOME MED. SAND. TAN. NO STRUCTURE.
	4	SS-2	14, 43, 51, 30	24	12	58-MW1-SB 0406 @ 0925		0406 2A - ~~2"~~ TOPSOIL FELL IN HOLE GRASS CLUMP. (DISREGARD) 2B - 8" SILTY SAND + ROCK FRAGS (SM), MOSTLY BLACK SHALE-LIKE ROCK FRAGS. WITH TRACE SILT + SOME FINE SAND. DARK GREY. 2C - 4" ~~SAME AS~~ SAND (SW) MOSTLY MED. WITH TRACE FINE SAND + SOME COARSE. NOSE IS WET. TAN
						▽ ~6'		

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:
37.40
65.60

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: ATO-118 LOCATION: TANK 58 DRILLED BY: C. STAMOS BORING NO.: MW-1

DATE STARTED: 7/11/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NA

DATE COMPLETED: 7/11/94 BEARING: CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	6	SS-3	37,40 56,60	24	11	58-MW1-SB 0806 @ 0930		0806 ANOTHER 4" OF TOPSOIL + GRASS IN TOP OF SPOON - DRILLER SAYS EITHER HE FOR DROPPED SPOON IN GRASS OR SOMETHING FELL IN HOLE. 11" INCHES SATURATED SAND (SP) MOSTLY MED. SAND WITH TRACE FINES + SOME COARSE SANDS. NO GRAVEL. TAN
	16	SS-4	45,15 18,17	24	20	58-MW1-SB 0810 @ 0940		0810 4A-4" SAND (SP) - MOSTLY FINE WITH SOME MED SANDS DARK BROWN 4B-4" SAME AS SS-3 4C-4" ~~SAME AS~~ SAND (SP) MOSTLY MED, TRACE FINES TAN. 4D-8" SAME AS 4B.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer
blows 30" to drive
a split barrel sampler;
boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

7,12 12,16 5,10,12 18,14 16 18,16 12,14

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG — NUS CORPORATION

PROJECT: CTO-178 LOCATION: TANK 58 DRILLED BY: C. STAMAS BORING NO.: MW-1

DATE STARTED: 7/11/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/11/94 BEARING: CHECKED BY: TOTAL DEPTH: 20'

508-436-0867 14467

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	10	SS-5	7,12 12,16	24	24	58-MW1-SB 1012 @ 0945		1012 5A - 9" SAND (SW) MOSTLY MED. WITH SOME FINES + SOME COARSE NO STRAT - TAN 5B - 5" SAND (SW) MOSTLY MED. WITH TRACE FINES + SOME COARSE + TRACE FINE GRAVEL. BLACK. 5C-10" SAME AS 5B, BUT OXIDIZED ORANGE WITH LESS GRAVEL.
	12	SS-6	13,14 16,19	24	24	58-MW1-SB 1214 @ 0950		1214 6A - 6" SAND (SP) ~50% ~~MOSTLY~~ FINE WITH ~50% MED. ~~TAN~~ 6B - 18" SAND (SP) MOSTLY MED. WITH TRACE FINE + SOME COARSE SAND DARK BROWN TO TAN.
	14	SS-7	43,32 23,20	24	17"	58-MW1-SB 1416 @ 1005		1416 SAME AS 6B.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Z - Natural ground water level

NOTES: 43 32 - 1416
23 20
1618 - 25, 100
72, 20
11 62
-44

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: TANK 58 DRILLED BY: C. STAMAT BORING NO.: MW-1

DATE STARTED: 7/11/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/11/94 BEARING: CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	SAMPLE BLOWS PER 6"	SAMPLE PEN. in.	SAMPLE REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	16	SS-8	25,100 7,7,20	24	19	58-MW1-SB ~~1610~~ 1618 @ 1010		1618 8A-9" SAND (SP) MOSTLY MED. WITH TRACE FINE + TRACE COARSE SAND. NO STRUCTURE, BROWN. 8B-10" SILTY FINE SAND (SM) MOSTLY FINE SAND WITH SOME SILT + SOME ROCK FRAGS, SUB-ANGULAR TO SUB ROUNDED. DARK GRAY
	18	SS-9	10,17 29,11	24	24	58 MW1-SB 1820 @ 1015		1820 9A - SAME AS 8A 9B - SAME AS 8B, BUT WITH MORE SILT.

EOH @ 20'

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG: NUS CORPORATION

PROJECT: CTO-178 LOCATION: TANK ~~SB~~ 56 DRILLED BY: C. STAMAS BORING NO.: B-1

DATE STARTED: 7/8/94 INCLINATION: LOGGED BY: T. DORAN GROUND ELEV.: NM

DATE COMPLETED: 7/8/94 BEARING: CHECKED BY: TOTAL DEPTH: 14'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								0002 NO SAMPLE
	2	SS-1	4,6 4,4	24	16	SB-B1-SB 0204 @ 1355		0204 1A-9" FINE-MED SAND (SP) MOSTLY FINES, SOME ~~MED~~. TRACE ROUNDED ~~GRAV~~ FINE GRAVEL. MED BROWN COLOR. ROOTS
								1B-9" - SILTY SAND (SM) MOSTLY FINE SAND TRACE SILT. MANY ROOTS + WOOD FRAGS. TAN.
	~~4~~					SB-B1-SB 0406 @ 1400		0406
	4	SS-2	11,15 31,50	24	19	▽ ~5'		2A-5" - SAME AS 1A.
								2B-8" - SAND (SP) MAINLY MED. SAND TRACE FINES + SOME COARSE. TRACE FINE GRAVEL. TAN
								2C - SAME AS ABOVE, BUT ORANGE TO TAN. WITH ROCK FRAGS SCHIST.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES: 32, 50 100/2"

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: 010-178 LOCATION: TANK 58 DRILLED BY: C. STANIAS BORING NO.: B-1

DATE STARTED: 7/8/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/8/94 BEARING: CHECKED BY: TOTAL DEPTH: 14'

ELEV feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	6	SS-3	32, 50 120/2"	14"	5"	58-B1-SB 1415		0808 ~~OIL SHEEN ON SPOON~~ SILTY SAND (SM) MOSTLY FINE SAND WITH TRACE SILT + TRACE MED SAND. TRACE FINE GRAVEL ROUNDED. - GRAY 3" OVER 3" OF TAN.
	8	SS-4	18, 19 16, 17	24	16	58-B1-SB 0810 @ 1420		0810 4-A - 4" SAME AS ABOVE 4B - 2" SILTY SAND (SM) MOSTLY FINES TRACE SILT - TRACE GRAVEL 4C - 10" DARK GRAY SAME AS 4A.
	10	SS-5	10, 16 17, 26	24	24	58-B1-SB 1012		1012 5A - 10" SAND (SP) MOSTLY MED SAND TRACE FINE, TRACE COARSE - TAN 5B - 7" SAND (SP) ~~SAM~~ MED. SAND & SOME COARSE SAND. OXIDIZED ORANGE. 5C - 7" SILTY SAND (SM) MOSTLY FINES WITH TRACE SILT, TRACE COARSE + TRACE FINE PEBBLES GRAY

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; casing blows per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural standing water table

NOTES:

15 15
15 18 16

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG:

NUS CORPORATION

PROJECT: 010-178 LOCATION: TANK-58 DRILLED BY: C. STAMAR BORING NO.: B-1

DATE STARTED: 7/8 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: WM

DATE COMPLETED: 7/8 BEARING: CHECKED BY: TOTAL DEPTH: 14'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	SAMPLE BLOWS PER 6"	SAMPLE PEN. in.	SAMPLE REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	12	SS-6	15,15 16,16	24	24	58-B1-SB 1214 @ 1435		1214 SAME AS 5A
								EOH @ 14'

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive 1 split barrel sampler; Boring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:

PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: OTO-178 LOCATION: TANK 58 DRILLED BY: C. STANAR BORING NO.: B-2

DATE STARTED: 7/8/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/11/94 BEARING: CHECKED BY: TOTAL DEPTH: 12

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0		13,12					0002 - NO SAMP.
	2	SS1	10,11	24	18	58-~~BZ~~-SB 0204 @ 1515 120 ppm		0204 STARTED BORING @ 1505 SAND (SP) MOSTLY MED. SAND WITH TRACES OF FINE + COARSE. FINE SUBROUNDED GRAVEL NEAR NOSE ~1/2" DIAM. BROWN. SHUT DOWN @ 1517 ON FRIDAY.
	4	SS2	13,21 25,30	24	12	58-BZ-SB 0406 @ 0822 10-12 ppm		START-UP @ 0810 ON MONDAY - 7/11. LEL/O_2 METER ON SITE. 0406 SAND (SW) MOSTLY MED. WITH SOME FINES. + TRACE COARSE SAND. CONCRETE FRAGS UP TO 1.5" DIAM. FOUND THRU-OUT. TAN-TO-BROWN
								V ~6'

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Z - Natural ground water table

NOTES:
DRILLING THRU PAVEMENT ON N.W. SIDE OF BUILDING. (BUILDING NOW DEMOLISHED).

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: TANK-58 DRILLED BY: C. STAMAS BORING NO.: B-2

DATE STARTED: 7/8/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/11/94 BEARING: CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	6	SS-3	43,38 28,36	24	20	SB-B2-SB 0608 @ 0825 =4-6 ppm		0608 SATURATED 6' ↓ 3A-16" SAND (SP) MED-COARSE WITH TRACE FINE GRAVEL. SUB ROUNDED-ROUNDED GRAINS TAN. 3B-2" SILTY SAND (SM) MOSTLY FINE SAND WITH TRACE SILT + TRACE COARSE SAND. DARK GREY
	8	SS-4	9,18 22,25	24	18	SB-B2-SB 0840 @ 0838 1-2 ppm		0810 SAME AS 3A (SP). ALT. BANDS OF TAN + OXIDIZED ORANGE
	10	SS-5	20,22 25,28	24	24	SB-B2-SB 1012 @ 0845 1-2 ppm		1012 5A - 12" SAME AS SS-4 5B - 12" SILTY FINE SAND (SM) MOSTLY FINE SAND, WITH TRACE SILT + SOME COARSE SAND. BROWN.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
Ⅴ - Natural ground water table

NOTES:
SHIP: 10-12 0204

EOH @ 12' - LAST 4 SAMPLES < 15 ppm

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

UST AREA D1

BORING LOG: NUS CORPORATION

PROJECT: CTO 175 LOCATION: C-130 DRILLED BY: S Warnick BORING NO.: 46-MW-1

DATE STARTED: 7-6-94 INCLINATION: Vertical LOGGED BY: EDI F Jackoff GROUND ELEV.: NM

DATE COMPLETED: 7-6-94 BEARING: NA CHECKED BY: TOTAL DEPTH: 14'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								ASPHALT - 2" THICK
1								NO SAMPLES 0-2'
2								
3		S-1	2-3 3-4	24	6	46-MW1-SB-0204 NB 0800		S-1 (6in) SILTY SAND, ~~some~~ ~~silt~~ tr gravel. F-M, PG, few pieces coarse subrounded sand, PG, few pieces coarse subrounded gravel up to 1/2-3/4 in; fine SR gravel up to 1/4 inches. Brown. (SM)
4								
5		S-2	2-3 3-2	24	11	46-MW1-SB-0406 0820 hrs 0.4 ppm z at N41		S-2 (11 in.) SILTY SAND, ~~some silt~~ tr. gravel F-M, PG; 1 piece fine SR gravel up to 1/4 in - oil odor. Brown. (SM)
6								
7		S-3	11-10 14-12	24	21	0822 hrs 46-MW1-SB-0608 ND		S-3A (8in) SILTY SAND tr gravel - similar to S-2 (SM) 1 piece fine SR gravel up to 1/4-1/2 inches. Brown
8								
9		S-4	9-7 7-10	24	18	0837 hrs 46-MW1-SB-0810 ND		S-3B (13in) SAND, trace silt. Fine sand, trace red sand, poorly graded. Greyish brown. (SP)
10								
11		S-5	11-30 14-14	24	20	0909 hrs 46-MW1-SB-1012 2-3 ppm on sample		S-4 (18in) SILTY SAND, tr gravel F/M sand poorly graded, Brown. (SP) tr. fine gravel up to 1/4
12								
13		S-6	14-14 14-21	24	20	0919 hrs 46-MW1-SB-1214 3 ppm on sample auger grinding on sample a lot.		S-5 (20 in) SILTY ~~SAND~~ CLAY, tr. gravel F/M sand poorly graded. Brown 1 piece coarse subangular gravel up to 1 1/2 (ML)
14								S-6A (14in) SILT, tr. sand. Brown is strong. Fine sand - poorly graded (ML)
15								
16								
17								
18								S-6B (6in) SILTY SAND & cinders & rock frags. Greyish brown. medium to coarse sand. Poorly graded coarse cinders up to 1 1/2" in length (SM)
19								
20								Refusal @ 14'

Depth 13

Well set 15.5'

Screened

NO Readings in BZ

Readings sustained up to 5 ppm in boring only

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
$\bar{Y}$ - Natural ground water table

NOTES:
Remove top 2'
Use HSA 4 1/4 ID 8" OD
2" Spoon
Continuous from 2' to 14'

DATE: 7-6-94 PROJECT NO.: 46-M
PAGE: 1 OF BORING NO.: 1

BORING LOG: **NUS CORPORATION:**

PROJECT: CTO 176 UST Investigation LOCATION: DRILLED BY: S. LaMarch - EDI BORING NO.: 46-MW2

DATE STARTED: 7-6-94 INCLINATION: Vertical LOGGED BY: K. Jalkut GROUND ELEV.: NM

DATE COMPLETED: 7-6-94 BEARING: NA CHECKED BY: TOTAL DEPTH: 18'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								ASPHALT - THICK
1								NO SAMPLES 0-2'
2								S-1 (14 in.) SILTY SAND tr-gravel. Fine to med. sand, tr coarse sand, poorly graded. Brown. Fine gravel/pebbles up to 1/4" (~~[illegible]~~) subrounded. Brick fragment, concrete chips. (SM/FILL)
3		S-1	9-11 11-7	24	14	46-MW2-SB-0204 1142 hrs Petroleum odor. ND on sample 600 ppm - headspace		
4								S-2A (8 in.) SILTY SAND, tr-gravel - similar to S-1. Brown. (SM) Brick frag. Concrete chips.
5		S-2	2-2 2-2	24	10	46-MW2-SB-0406 1151 hrs Petroleum odor ~500 ppm headspace		
6								S-2B (2 in) Organic silt. Fibrous - wood chunks - plant matter/roots. Brown. (OL)
7		S-3	14-12 12-10	24	12	46-MW2-SB-0608 1153 hrs ~100 ppm headspace.		S-2C (2 in) SAND, tr. silt. Fine sand, tr. med. sand, poorly graded. Lighter brown than S-1. (SP).
8								
9		S-4	5-4 4-3	24	15	46-MW2-SB-0810 1203 hrs 100 ppm headspace		S-3A (5 in) SILTY SAND tr organic (plant roots). Fine sand, tr. med sand poorly graded. Brick fragments (SM). Picked coarse gravel piece - 1/2-1 1/2" in length
10								
11		S-5	3-3 3-2	24	18	46-MW2-SB-1012 1210 hrs 50 ppm headspace		S-3B (7 in) SAND tr. silt. F/M sand tr. coarse sand poorly graded (SP). Lighter brown than S-3A.
12								
13		S-6	11-14 15-21	24	20	46-MW2-SB- 1214 1220 50 ppm headspace.		S-4A (7 in) SILTY SAND tr gravel. Fine sand, tr. med sand, poorly graded. a few pieces subrounded fine gravel up to 1/2 inch in length. Brown. Some stratification noted - reddish bands (very thin). (SM)
14								
15		S-7	10-9 9-11	24	17	46-MW2-SB 1416 1300 hrs 20 ppm		
16								
17		S-8	15-15 21-16	24	16	46-MW2-SB 1618 7 ppm 1309 hrs		S-4B (8 in) Silt, some clay. Grey, Shiny. Trace fine sand. Tr coarse subrounded gravel 3 1/2-3 1/2" in length (ML-CL)
18								
19		~~S-8~~	EOB @ 18'					
20								

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive 4" split barrel sampler; boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES: HSA 4 1/4" ID auger. 2" split barrel sampler. Continuous from 2' to 18'. Using far headspace technique.

No obvious water table, water table not encountered in 46-MW2.

Saturated in bottom 2' of borehole reducing suction

DATE: 7-6-94 PROJECT NO.: 005
PAGE: 1 OF 1 BORING NO.: 46-MW2

BORING LOG: CTO 177 **NUS CORPORATION**

PROJECT: UST Investigation **LOCATION:** 4/6 UST **DRILLED BY:** [illegible] **BORING NO.:** 4/6-MW2

DATE STARTED: 7-6-94 **INCLINATION:** Vertical **LOGGED BY:** [illegible] **GROUND ELEV.:** NM

DATE COMPLETED: 7-6-94 **BEARING:** NA **CHECKED BY:** **TOTAL DEPTH:** 18'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								S-5 (18in) SILT some gravel trsand Fine sand tr. red sand poorly graded Fine subrounded gravel up to 1/2-3/4" in length. Greyish black. Shiny. (ML)
								S-6 (20 in) SILT ~~some~~ tr. sand tr. tr. gravel clay ~~[illegible]~~ ~~to 1-1/2 ft.~~ Grey-black. Shiny. F/M sand poorly graded; fine subangular + subrounded gravel less than 1/2" in length (ML) (possibly concrete chips)
								S-7 (17in) SILT, some clay, ~~tr.~~ some sand trace gravel. F/M sand, tr coarse sand, poorly graded; coarse subrounded gravel up to 1 1/4 inches rock fragments - broken in split barrel (ML)
								S-8 (6in) Similar to S-7 (ML) Broken rock in split barrel caused by advancement. Mostly fine sand, tr med sand poorly graded.
								EOB @ 18' Set well cut.
								¶ 15+1 See well Construction Log.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Z - Natural ground water table

NOTES: HSA 4 1/4" ID 8" OD
2" ID split barrel sampler
Continuous soil sampling 2' to 20'
Jar Headspace technique

DATE: **PROJECT NO.:** 1405
PAGE: 2 OF 2 **BORING NO.:** 4/6-MW2

BORING LOG — **NUS CORPORATION**

PROJECT: CTO 178 LOCATION: Bldg Tank 47 DRILLED BY: C STAMAS BORING NO.: MW ~~47~~ #1

DATE STARTED: 7-6-94 INCLINATION: LOGGED BY: W Martin / T Bergen GROUND ELEV.: 10 M

DATE COMPLETED: 7/6/94 BEARING: CHECKED BY: TOTAL DEPTH: 20 FT

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
~~0~~	0							0204
~~2~~	2	SS-1	24-19	18"	12"			Silt - some fine sand trace
~~4~~	4		-120/6"					pebbles up to 1/2" dia. -
			3-12					concrete chips throughout
			-23					sample - black (ML)
	6					drilled thru		Petroleum odor
	8					boulder		
						from		
			3-12			~~18-24"~~		
	~~10~~ 6		23-24			3 1/2'-4'		
				24"	16"			0406
								0-4"
		SS-2						~~4'-4'4"~~ similar to 0204
								4-8"
	6							~~4'4"-4'8"~~ organic silt - root
								matter trace coarse sand,
								brick chips (OL)
						nose of		8-16"
						split barrel		~~4'8"~~ silty sand - fine sand
						wet		poorly graded, brown
			24-31					uniform texture, no structure
			-23-22					(SM) ~~OL~~
				24	24			
								0608
								0"-9" silty sand - fine to medium
		SS-3						sand some organic matter
	8							and concrete chips - Petroleum odor
								9-20" silty sand - fine to medium
								sand - some silt - poorly
								graded - uniform ~~texture~~,
								no structure brown (SM) ~~OL~~
								20-24 banded grey black silty
								clay

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
~10' FROM MW47#1 HAVE OIL STAINED SAND + GRAVEL ON SURFACE BETWEEN BUILDING 130-131.

DATE: 7/6/94 PROJECT NO.: CTO 178
PAGE: 1 OF 3 BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: TO 178 LOCATION: BLDG TANKS 1/7 DRILLED BY: C. STAMKAS BORING No.: MW 7

DATE STARTED: 7-6-94 INCLINATION: LOGGED BY: D. MARTIN / T. DORGAN GROUND ELEV.: NA

DATE COMPLETED: 7/6/94 BEARING: CHECKED BY: TOTAL DEPTH: 70 FT

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	SAMPLE BLOWS PER 6"	SAMPLE PEN. in.	SAMPLE REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	10	SS-4	8-9 14-14	24	17	DUP		0 8 10 0-16 silty clay sanded grey, brown trace ~~fine~~ coarse sand/pebbles at bottom of sample (CL) 16-17 silty sand - fine sand, grey trace med-coarse sand (SM)
	12	SS-5	6-12 14-16	24	14			10 12 SILTY FINE SAND 0-5 ORGANICS & SOME M.S. 5-9 SILT WITH LITTLE FINE SAND 9-16 FINE SAND - TAN LITTLE M.S. 16-18 SILT WITH FINE SAND GREY
	14	SS-6	14 14 18-21	24	24			12 14 GA 0-20" FINE SAND, TAN GB 20-24" SILT + FINE SAND LIGHT GREY
	16	SS-7	21-31, 31,34	24	1			14 16 GA ROCK FRAG (QTZ) IN NOSE. 1" RECOVERY SILTY FINE SAND DARK GREY
	18	SS-8	33,39 31,34					16 18 sandy silt - fine to medium sand coarsening downward grey trace pebbles (ML)

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: MTO 178 LOCATION: BLDG TANK 47 DRILLED BY: C. STAMAS BORING NO.: MN-[illegible]1

DATE STARTED: 7-6-94 INCLINATION: VERT LOGGED BY: N. MARTIN / T. DURGAN GROUND ELEV.: NM

DATE COMPLETED: 7/6/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20 FT

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	20	SS-9	35,49 30,27	24	17			18-20 F.S. TO SILT WITH SUBROUNDED TO SUB ANGULAR GRAVEL. UP TO 1.5".
								EOH @ 20'
								REFER TO WELL CONSTRUCTION LOG FOR DETAILS.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN. - Penetration length of sampler
REC. - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

PROJECT: OTO-17X	LOCATION: TANK 47	DRILLER BY: C. STAMAS	BORING NO.: 47 R1
DATE STARTED: 7-6-94	INCLINATION:	LOGGED BY: T. DERGAN	GROUND ELEV.: NOM
DATE COMPLETED: 7-7-94	BEARING:	CHECKED BY:	TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	2	SS-1	23,13 8,3	24	16			0204 FINE-MED SAND (SW) GRAY WITH SUB-TO ROUNDED PEBBLE UP TO 1" IN. DIAM.
	4	SS-2	8,24 38,37	24	20			0406 3" 2A - SAME AS ABOVE (SW) 2B 5" REDDISH FINE SAND - SOME SILT & SOME MED. SAND (SM) 2C 12" FINE-MED SAND TAN WITH SOME COARSE SAND (SW)
						NV@6'		0608
	6	SS-3	20,21 23,23	24	24			3A - 5" GRAY FINE-MED. SAND. (SP) 19" ALTERNATING BANDS OF TAN & GREY SILTY FINE SAND (SM)
	8	SS-4	5,17 15,20	24	14			0810 FINE SANDY SILT WITH ALTERNAT TAN + GRAY LAYERS ~1" CONC SOME MED SAND GRAINS

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive 1 split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
Ⅴ - Natural ground water level

NOTES: - GROUND SURFACE SHOWS OIL STAINING ~ 8-10' FROM B-1. -

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG:

PROJECT: ATO-178	LOCATION: TANK 47	DRILLED BY: C. STAMAS	BORING NO.: 4781
DATE STARTED: 7/6/94	INCLINATION:	LOGGED BY: T. DOUGHTY	GROUND ELEV.: N/M
DATE COMPLETED: 7/7/94	BEARING:	CHECKED BY:	TOTAL DEPTH: 20'

ELEV feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	10	SS-5	12,14 15,17	24	18	1430 hrs		1012 SANDY FINE SAND SOME MED. SAND IN LENS (SM) OR LAYERS ALT. TAN + GREY LAYERS ~1" THICK
	12	SS-6	40,28 30,4	24	20	1440 hrs.		1214 8" OF SAME AS ABOVE (SM) 13" OF DARK GREY SILT TO FINE GRAVEL (GRAVEL IS UP TO 1/2" IN DIAM. + IS SUB-ROUND TO ROUNDED. STARTED DRILLING ON 7/6/94 @ 15:20 RESUMED DRILLING ON 7/7/94 @ 07:30.
	14	SS-7	28,27 30,23	24	18	OVA ✓ @0740 = Ø.		1416 7A - 8" (SM) SILTY FINE SAND DARK BROWN - GREY LOWER INCH SHOWS STRATIFICATION BANDS TAN + GREY ~1/4". 7B - 10" DARK GREY SILT TO CLAY RANDOM. SILT. HAS SOME SUBROUNDED PEBBLES.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:
~~1424 1426 1428 1430 1432 1434 1436 1438 1440~~
GROUND SURFACE SHOWS OIL STAINING

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG — **NUS CORPORATION**

PROJECT: CTO-178 LOCATION: TANK 47 DRILLED BY: C. STANTAS BORING NO.: B-1

DATE STARTED: 7-6-94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7-7-94 BEARING: CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	16	SS-8	41,34 34,28	24	16	0805 hrs		1618 BROWN. SILT WITH SOME FINE SAND. (SM). DARK GREY. HAS SOME SUBROUNDED PEBBLE UP TO 3/4" DIAM.
	18	SS-9	25,29 34,38	24	24	0815 hrs		1820 SAME AS ABOVE (SM) WITH 1/4-1/2" GRAVEL ~~PEBBLE~~ ~~PIECE ORANGE PLASTIC OR DARK METAL FOUND IN NOSE FROM NOSE. NOT BASKET (2) TRUCK PAINT~~
								20' = EOH
								LEFT SITE TO DECON RIG + TOOLS @ ~~0830~~ 0830 hrs.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
∇ - Natural ground water table

NOTES:
GROUND SURFACE SHOWS OIL STAINING
- ORANGE PIECE IN NOSE OF LAST SPOON = PAINT FLECK OFF DRILL RIG.

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG: **NUS CORPORATION:**

PROJECT: 8 CTO-173 LOCATION: TANK 147 DRILLED BY: C. STAMAS BORING NO.: 4B-2

DATE STARTED: 7/6/94 INCLINATION: LOGGED BY: T. DORLAN GROUND ELEV.: N/M

DATE COMPLETED: 7/6/94 BEARING: CHECKED BY: TOTAL DEPTH: 12 FT

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
Ø	Ø		3, 2	24	12	EASY		0204 CONCRETE TRACKS + METAL SHAVINGS
	2	SS-1	1, 2					1A FINE-MED SAND (SP) 0-8"
			10, 30					1B SM-SC WITH ORGANICS, PEATY 8-12
			45, 29					
	4	SS-2	11, 30	24	18			0406
			45, 29					2A 3.5" OF SP-SM - GREY
								2B 9" OF RED-TAN FINE TO MED SAND 1 PEBBLE ~ 3/4"
						~▽~ 6'		2C 6" SM SILTY SAND WITH WHITE IN NOSE.
	6	SS-3	21, 31	24	24			0608
			34, 40					3A 8" TAN FINE - MED. SAND BLENDING INTO
								3-B 8" GREY FINE SAND SOME SILT (SM)
								3-C 3" PREDOM. MED SAND LT. GREY (SP)
								5" FINE SAND TO SILT ~ 25% DARK GREY (SM)
	8	SS-4	22	24	20			0810
			39, 41					4-A 6" TAN FINE - MED. SAND UP TO 1/2" PEBBLE (SM)
			45					1H" GREY FINE - MED. SAND PEBBLE (SM) LITTLE SILT + COARSE SAND
								LAST 1/2" CONTAINS MORE SILT ~ 30%

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

PROJECT: CTO-178	LOCATION: TANK 47	DRILLED BY: C. STAMAS	BORING NO.: 47-8-2
DATE STARTED: 7/6/94	INCLINATION:	LOGGED BY: T. DORGAN	GROUND ELEV.: ASMA
DATE COMPLETED: 7/6/94	BEARING:	CHECKED BY:	TOTAL DEPTH: 16 FT

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	10	SS-5	10 31,23 21,19	24	24			10+2 5-A 16" FINE - MED SAND WITH SOME SILT (SM) GREY
								5-B 8" SILT TO FINE SAND TAN + GREY SAND, NL ~1" (ML)
	12	SS-6	47,11 9,9	24	14			12+4 6-A DARK GRAY SILTY SAND (SM) FINE SAND + SILT WITH ROCK FRAGS (SCHIST WITH QTZ BLEBS. FINING TO BOTTOM.
	14	SS-7	16,24 40,3					14+6 SAME AS ABOVE DARK SILTY SAND (SM) POOR RECOVERY DUE TO ROCK FRAG ~1-1.5" QTZ-MICA SCHIST
								16' = EOH

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; drilling time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Ψ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

PROJECT: CTO 174 LOCATION: Dayton RI DRILLED BY: EDI - Scott LaMarch BORING NO.: 48-MW1

DATE STARTED: 7-7-94 INCLINATION: Vertical LOGGED BY: K Jalkut GROUND ELEV.: NM

DATE COMPLETED: 7-7-94 BEARING: NM CHECKED BY: TOTAL DEPTH:

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							NO SAMPLES 0-2' - NO ASPHALT
	1							
	2							
	3	S-1	12-18 16-13	24	8	48-MW1-SB-0204 0837 hrs >100 ppm		S-1 (8 in) SILTY SAND tr gravel. Fine to trace med sand, tr. coarse sand, poorly graded. 1 piece coarse subrounded gravel up to 1 1/4" in length; fine subrounded gravel/pebbles up to 1/4" in length. Dark brown. (SM). Petroleum odor. Concrete chips
	4							
	5	S-2	1-1 2-4	24	20	48-MW1-SB-0406 0845 hrs > 1000 ppm		S-2A (4 in.) SILTY SAND. Fine sand tr. med sand poorly graded. Greyish-black. Root matter. (SM)
	6							
	7	S-3	21-20 18-17	24	20	48-MW1-SB-0608 0850 ▽@6' 700 ppm		S-2B (6 in) Organic silt (peat). Dark brown w/ organic (plant material). (OL)
	8							
	9	S-4	5-5 3-4	24	16	48-MW1-SB 0810 0900 >200 ppm		S-2C (10 in.) SILTY SAND Fine sand tr. gravel. Fine subrounded gravel 1/4" in length. Reddish-brown (SM)
	10							
	11	S-5	9-11 14-17	24	22	48-MW1-SB-1012 0908 > 100 ppm		S-3A (9 in) SILTY SAND. Fine sand poorly graded, no visible stratification. Reddish brown. (SM)
	12							
	13	S-6	9-11 11-16	24	15	48-MW1-SB-1214 0912 350 ppm		S-3B (11 in) SAND, tr silt. Fine sand poorly graded. Grey. (SP)
	14							
	15	S-7	10-26 16-8	24	20	48-MW1-SB-1416 0920 hrs >150 ppm		S-4A (8 in) Organic silt. Plant/Root/Fibers material. Dark brown. (OL)
	16							
	17	S-8	11-15 18-12	24	22	48-MW1-SB 1618 0930 hrs 200 ppm		S-4B (6 in) Silt, some sand, some organic plant fiber. Brownish-gray (ML)
	18							S-4C (2 in) SAND, tr. Silt - similar to S-3B (SP)
	19	S-9	14-17 15-14	24	12	48-MW1-SB 1820 0948 hrs.		
	20							

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; or blows per foot of rock coring time
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES: Intermittent readings - only 30 ppm
HSA 4 1/4 ID 8" OD augers
2" ID split barrel
Continuous soil sampling 2' to 12' in 2' increments
No readings in BZ
Jar Headspace Technique Used

DATE: 7-7-94 PROJECT NO.: 1905
PAGE: 1 OF 2 BORING NO.: 48-MW1

BORING LOG: NUS CORPORATION

PROJECT: CT 77	LOCATION: Dunsmuir CT	DRILLED BY: ENT - Slamanch	BORING NO.: 48-MW1
DATE STARTED: 7-7-94	INCLINATION: Vertical	LOGGED BY: K Daniel	GROUND ELEV.: NM
DATE COMPLETED:	BEARING: NM	CHECKED BY:	TOTAL DEPTH:

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	SAMPLE BLOWS PER 6"	SAMPLE PEN. in.	SAMPLE REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								S-5A (5in) Organic silt. Dark brown w/ fibers + plant matter. (OL)
								S-5B (5in) Silt, some sand, some organic material Fine sand. Similar to S-4B (ML)
								S-5C (6in) Sand, tr. silt F/M sand poorly graded. Grey (SP)
								S-5D (3in) Sand, some silt. Fine sand poorly graded. Grey-tan Stratified (SM)
								S-5E (3in) Sand tr silt -- similar to S-5C. (SP)
								S-6A (4in) Silty sand F/M sand poorly graded. Brown. (SM)
								S-6B (3in) Sand ~~tr~~ some silt - similar to S-5D. (SM). Tan-grey
								S-6C (8in) Sand, some silt Fine sand poorly graded. Grey (SM)
								S-7A (11in) Silty Sand, ~~some silt~~, F/M sand poorly graded. Brown (SM)
								S-7B (9in) Silt and Clay. Grey Black tr. gravel. 1 piece coarse subangular gravel up to 2 inches in length. (ML-CL)
								S-8A (20in) Silt, some sand F/M sand poorly graded. Dark brown
								S-8B (21in) Silty sand Fine sand Grey Black Rock fragments lodged in spoon (SM)
								S-9A (5in) Sand, ~~some~~ some silt Fine sand tr. med sand poorly graded Brown. (SM)
								S-9B (7in) Silt, some sand, tr. gravel Fine sand; poorly graded. 1 piece coarse subrounded gravel up to 1 1/2 in in length

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Z - Natural ground water level

NOTES:
HSA 4 1/4 ID 8" OD
2" spoon
Continuous 2-20' lengths pail
Jar

DATE: PROJECT NO.:
PAGE: 2 OF 2 BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO 178 NCBC LOCATION: Davisville RI DRILLED BY: EDI S. Lamarch BORING NO.: 48-MW2

DATE STARTED: 7-7-94 INCLINATION: Vertical LOGGED BY: K. Jalkut GROUND ELEV.: N/A

DATE COMPLETED: 7-7-94 BEARING: N/A CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								NO SAMPLES 0-2' NO ASPHALT
1								
2								S-1 (10 in) SILTY SAND. Fine sand poorly graded; root matter - plant fibers. Dark brown to brown (SM)
3		S-1	4-2 2-3	24	10	48-MW2-SB-0204 1117 hrs 60 ppm		
4								S-2A (7 in) SAND, some silt. Fine sand tr med sand poorly graded. Light brown/tan. (SM)
5		S-2	3-4 4-6	24	19	48-MW2-SB-0406 1122 hrs 500-600 ppm		S-2B (12 in) SAND, some silt - similar to S-2A except for color. Grey. (SM)
6								
7		S-3	6-6 8-9	24	20	48-MW2-SB 0608 1127 hrs 600-700 ppm		S-3A (9 in) SILTY SAND. Fine grained poorly graded. Greyish brown (SM)
8								
9		S-4	4-7 8-6	24	24	48-MW2-SB 0810 1138 hrs 350 ppm		S-3B (13 in) SAND some silt Fine grained poorly graded. Stratified Grey. (SM)
10								
11		S-5	6-6 8-9	24	18	1148 hrs 48-MW2-SB 1012 300 ppm		S-4A (8 in) Organic silt, tr sand, tr gravel. Fine sand poorly graded. Root fibers - plant matter. (OL) Dark brown
12								
13		S-6	6-6 9-11	24	24	48-MW2-SB 1214 1151 hrs 200 ppm		S-4B (5 in) Fine SP grading up to SM. SILTY SAND. Fine sand, PG; grey - stratified (SM)
14								S-4C (13 in) SILTY SAND F/M sand poorly graded. Grey. (SM)
15		S-7	4-3 24	24	21	48-MW2-SB 1416 100 ppm 1231 hrs		S-5A (4 in) SILTY SAND, ~~loose silt~~. Fine grained poorly graded. (SM) Grey
16								
17		S-8	5-6 6-7	24	13	48-MW2-SB 1616 100 ppm 1234 hrs ~~Instrument Failure~~		S-5B (10 in) SAND, tr silt F/M sand, PG Grey. (SP)
18								
19		S-9	9-9 21-15	24	12	48-MW2-SB 1820 1250 hrs ~~Instrument Failure~~		S-5C (4 in) SILTY SAND. Fine sand poorly graded. Grey - banded (SM)
20								

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; cores time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
HSA 4¼ ID 8" OD
Cont. Sampling 2-20'
2' increments
Jar Headspace

DATE: 7-7-94 PROJECT NO.: 1905
PAGE: 1 OF 2 BORING NO.: 48-MW2

BORING LOG:

NUS CORPORATION

PROJECT: CTC 178 NCBC LOCATION: Davisville RI DRILLED BY: EDI - S. Lanahan BORING NO.: 48-MW2

DATE STARTED: 7-7-94 INCLINATION: Vertical LOGGED BY: K. Valkovt GROUND ELEV.: NM

DATE COMPLETED: 7-7-94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								S-6A (12in) SAND, tr. silt. Fine sand, poorly graded, Grey (SP)
								S-6B (7in) SILTY SAND, Fine sand poorly graded, Grey - banded. (SM)
								S-6C (5in) SILTY SAND Fine sand poorly graded. Brown. (SM)
								S-7A (7in) SILT, tr. sand. Fine sand poorly graded. Grey-black (ML)
								S-7B (9in) SILTY SAND Fine sand poorly graded - banded Grey (SM)
								S-8A (6in) SILTY SAND Fine sand similar to S-7B - Grey (SM)
								S-8B (4in) SILT. Grey black. (ML) very soft
								S-8C (3in) SILT, some sand. Med to coarse sand or gravel granule or weak lithic. Poorly graded. Black. (ML) Brittle consistency
								S-9 (12in) Similar to S-8 (ML)
								EOB at 20'
								Set well @ 9'
								Backfill from 20 to 9'

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
HSA 4 1/4" ID augers
8" OD
2" spoon 2' increments
Continuous 2'-20'

48-MW2
Jan Headspace Techniq

DATE: 7-7-94 PROJECT NO.: 1905
PAGE: 2 OF 2 BORING NO.: 48-MW2

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: TANK 62 DRILLED BY: CHRIS SPAMAL BORING NO.: MW-1

DATE STARTED: 7/7/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/7/94 BEARING: CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0			11, 12			SS1 @ 1100		@ W 1' OVA = 2ppm
	2	SS-1	8, 7	24	17			0204 SAND, FINE-MEDIUM WITH TRACE AMNT. FINE GRVL. WOOD + ROOTS THROUGHOUT DARK GRAY ~~FROM~~ EXCEPT FOR COLOR Δ @ LAST INCH IN NOSE = BROWN. 150-200ppm
	4	S-2	20, 35 37, 27	24	14	@ 1110 ~ ▽ @ 6'		0406 2A - 4" SAND, ~~FAN~~ SAME AS ABOVE 2B - 2" ROCK FRAGMENT UP TO 3/4" DIAM. = RUSTY WEATHERED SCHIST. 2C - 1" SAME AS 2A 2D - 2.5" SAND, FINE TO COARSE PREDOM MED. TAN - FINING ABOVE + BELOW MIDDLE. 2E - 4.5" ~~SI~~ SAND, FINE TO MED WITH TRACE SILT (SM) WATER IN NOSE @ 6'.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES: DEDICATED BIT → 8-10' ~~PAPU~~ TOR

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG — **NUS CORPORATION**

PROJECT: CTO-178	LOCATION: HNK 62	DRILLED BY: C. STEMAS	BORING NO.: MW-1
DATE STARTED: 7/7/94	INCLINATION:	LOGGED BY: T. DORGAN	GROUND ELEV.: NM
DATE COMPLETED: 7/7/94	BEARING:	CHECKED BY:	TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	6	SS 3	13,17 17,12	24	24	@ 1115		0608 SILTY SAND, FINE - MED. FINING TOWARDS BOTTOM, BUT FINE GRAVEL FOUND IN LAST 4" (SM)
	8	SS4	14,17 23,10	24	16	@ 1120		0810 4A = 7" SILTY SAND, MOSTLY FINES WITH TRACE MEDIUM. + TAPERS IN TO (SM) 4B = 3" TAPERING SILTY FINE SAND (SM) ALT. LAYERS TAN & GRAY 4C = 6" SILTY FINE SAND. SOME ROUNDED GRAVEL ~10% DARK GRAY
	10	SS-5	33,92 54,41	24	16	@ 1135		1012 5A - 6" SAME AS 4C 5B - SILTY SAND. - SOME GRAVEL MANY BRICK FRAGS. + PES. METAL FRAGS, DARK GRAY TO BROWN RUSTY SCHIST IN NOSE @ END

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water table

NOTES: 35 25 124 19 14

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-174	LOCATION: TANK 62	DRILLED BY: C. STAMAS	BORING NO.: MW-1
DATE STARTED: 7/7/94	INCLINATION:	LOGGED BY: T. DURGAN	GROUND ELEV.: NM
DATE COMPLETED: 7/7/94	BEARING:	CHECKED BY:	TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	12	SS-6	35,25 19,19	24	20	@ 1140		1214 6A 13" SILTY SAND (SM) MOSTLY FINES WITH TRACE SILT + TRACE FINE GRAVEL. GRAY TO BROWN. 6B 7" SILTY FINE SAND & GRAVEL ~25% GRAVEL UP TO 1/2" DIAM. SUBROUNDED.
	14	SS-7	31,25 21,17	24	8"	@ 1145		SAME AS 6B. POOR RECOVERY DUE TO ROCK FRAGS IN NOSE.
	16	SS-8	13,15 19,27	24	16"	@ 1150		SAME AS 6B + SAMPLE 8. GRAVEL THROUGHOUT

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water table

NOTES:

13 14
19 23

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG:

PROJECT: CTD-178 LOCATION: TANK 62 DRILLED BY: C. STAMAS BORING NO.: MW 1

DATE STARTED: 7/7/94 INCLINATION: LOGGED BY: J. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/7/94 BEARING: CHECKED BY: TOTAL DEPTH: 20

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	SAMPLE BLOWS PER 6"	SAMPLE PEN. in.	SAMPLE REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	18		13,14 19,23	24	16	@ 12:00		1820 SAME AS ABOVE GRAVEL TO 3/4" DIAM.
								EOH @ 20'

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Σ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG:

PROJECT: CTO-178	LOCATION: TANK-62	DRILLED BY: CHRIS	BORING NO.: B-1
DATE STARTED: 7/7/94	INCLINATION:	LOGGED BY: T. DORGAN	GROUND ELEV.: N/M
DATE COMPLETED: 7/7/94	BEARING:	CHECKED BY:	TOTAL DEPTH: 14'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								~~0004~~ NOT SAMPD. 0002
	2	SS-1	6,11 39,21	24	17	@1330		0204 SAND. FINE TO MED. WITH TRACE SILT (SW) BRICK FRAGS + SOME ORGANICS
	4	SS-2	24,25 34,39	24	24	▽ ~5-6' @1340		0406 2A - 3" SAND, FINE-MED WITH TRACE SILT (SM) DARK GRAY TRACE SMALL GRAVEL 2B - 1" SAND, FINE-COARSE (SP) PREDOM. MED. 2C - 20" SILTY SAND (SM) FINE-MED SAND WITH TRACE SILT GRAY + CHANGING TO TAN IN NOSE
	6	SS-3	29,20 25,34	24		@1345		0608 3A - 2" SAME AS 2C (SM) 3B - 4" SILTY SAND. PREDOM FINE SAND SOME SILT. ALT. BANDS TAN + GRAY (SM) 3C - 2" SAND WITH TRACE SILT + TRACE FINE GRAVEL
								3D - 16" SILTY SAND FINE SAND MED SOME SILT ALT BANDS TAN + GRAY

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

24

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG:

PROJECT: STO-178 LOCATION: TANK 62 DRILLED BY: CHRIS BORING NO.: B-1

DATE STARTED: 7/7/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/7/94 BEARING: CHECKED BY: TOTAL DEPTH: 14'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	14,20 22,24	24	11	@ 1350		0810 4A - 2" SILTY SAND (SM) PREDOM. FINE SAND. TRACE SILT TRACE MED SAND - BRICK FRAG. 4B - 3" SILTY SAND (SM) FINE SAND SOME SILT - TAN BRICK FRAGS 4C - 6" SAME AS 4B, BUT GRAY & ~30% SILT.
	10	SS-5	20,25 25,60	24	12	@ 1400		1012 5A - 5" SILTY SAND (SM) MOSTLY FINE SAND TRACE FINE GRAVEL + BRICK FRAG GRAY. 5B - 5" SILTY SAND (SM) MOSTLY FINE SAND TRACE SILT. TAN 5C - 1" SAME AS 5A.
	12	SS-6	50,24 25,34	24	20	@ 1420		1214 6A = 18" SILTY SAND (SM) PREDOM. FINES WITH SOME SILT. BRICK FRAGS. 9" = GREY OVER 9" OF TAN. 6B = 2" SILTY SAND (SM) WITH GRAVEL TO 1" DIAM DARK GREY.
						EOH @ 14		

LEGEND:
TYPE-NO. = Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; drilling time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Ⅴ - Natural ground water table

NOTES:

DRILLED ~5' FROM ASBESTOS DUMPSTER.

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG — **NUS CORPORATION**

PROJECT: CTO-178 LOCATION: TANK 62 DRILLED BY: C. STAMAS BORING NO.: B-2

DATE STARTED: 7/8/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/8/94 BEARING: CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	Ø		20 30 30,27					0'-2' NO SAMP. START DRILLING @ 0725
	2	SS-1		24	19	62-B2-SB 0204 @ 0730		0204 SAND. (SW) WELL GRADED. MOSTLY FINE WITH SOME MED. + TRACE FINE GRAVEL. BRICK FRAGS THRU OUT + GRAY.
	4	SS-2	50,61 77,30	24	22	62-B2-SB 0406 @ 0740		0406 2A- 10" SAME AS ABOVE. 2B- 4" SAND, POORLY GRADED (SP) LT-GRAY WITH MOSTLY FINES. SP SAMP. 1-1" GRAVEL SUBROUNDED.
						▽ ~6'		
						OVA @ 0743 = 25 ppm AT ABOVE		2C - 1" - OILY SMELLING FLAKY MATERIAL - DARK GRAY FINE-MED. GRAINED
	6	SS-3	16 15 7 20	24	16	62-B2-SB 0608 @ 0745		2D - 7" SILTY SAND (SM) - MOSTLY FINES WITH SOME SILT TRACE MED. ~~TAN Y GRAY~~ 0608
								3A - 12" SAME AS 2D.
								3B - 4" SILTY SAND (SM) MOSTLY FINE SAND WITH SOME ~~FINES~~ SILT + TRACE OF COARSE SAND. DARK GRAY WITH STRONG OIL ODOR.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC. - Length of sample recovered
▽ - Natural ground water level

NOTES: ~~8 14 16~~ ~~14, 24, 20, 20~~ ~~9 14 19~~ NO SAMP. 0-2' HEAD SPACE ANAL. IN DRILLERS JARS

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG:

PROJECT: CTO-178 LOCATION: TANK 62 DRILLED BY: C STAMAR BORING NO.: B-2

DATE STARTED: 7/8/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/8/94 BEARING: CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	9,12 16,19	24	20	62-B2-SB 0810 @ 0750		0810 - OIL SHEEN HEAVY IN SPOON SILTY SAND (SM) ALT. BANDS GRAY + TAN. MOSTLY FINE SAND WITH SOME SILT. BRICK FRAGS NEAR TOP. SUBROUNDED FINE GRAVEL THRU-OUT.
	10	SS-5	17,18 28,16	24	12	62-B2-SB 1012 @ 0800		1012 SILTY SAND (SM) MOSTLY FINE, SOME SILT + ~~SOME~~ TRACE GRAVEL UP TO 1". DARK GRAY - GRAVEL SUB RDD
	12	SS6	14,24 20,20	24	19	62-B2-SB 1214 @ 0805		1214 SAME AS ABOVE - WITH BRICK FRAGS

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Ψ - Natural ground water table

NOTES:

14 29 25 20 14 16 17 20 18 20 14 18 18 22 16 18

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG: **NUS CORPORATION**

PROJECT: CTO-178	LOCATION: TANK 62	DRILLED BY: C. STAMAS	BORING NO.: B-2
DATE STARTED: 7/8/94	INCLINATION:	LOGGED BY: J. DORGAN	GROUND ELEV.: N/M
DATE COMPLETED: 7/8/94	BEARING:	CHECKED BY:	TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	14	SS-7	14 29 26 20	24	12	62-B2-SB 1416 @ 0830		1416 SILTY SAND (SM) MOSTLY FINE SAND WITH TRACE SILT, TRACE MED. SAND & TRACE FINE GRAVEL, NO MORE BRICK FRAGS. DARK GRAY
	16	SS-8	14, 18 22, 25	24	14	62-B2-SB 1618 @ 0815		1616 SAME AS ABOVE
	18	SS-9	17, 20 28, 30	24	16	62-B2-SB 1820 @ 0820		1820 SAME AS ABOVE
								BOH @ 20'

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
14 16
22 15
17 20
28 30

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTC 178 | LOCATION: Davisville RI | DRILLED BY: EDI - S Lamarch | BORING NO.: 63-MW1

DATE STARTED: 7-8-94 | INCLINATION: Vertical | LOGGED BY: K Jaikit | GROUND ELEV.: NM

DATE COMPLETED: 7-8-94 | BEARING: NM | CHECKED BY: | TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	SAMPLE BLOWS PER 6"	SAMPLE PEN. in.	SAMPLE REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								NO SAMPLES 0-2' NO ASPHALT
1								
2								
3		S-1	5-2 3-4	24	2	63-MW1-SB-0204 0801 hrs 45 ppm		S-1 (2 in.) SILTY SAND, tr. gravel. Fine sand tr. med sand, poorly graded; fine subrounded gravel up to 1/4" in length. Brown. (SM) Loose soil; dry
4								
5		S-2	7-12 17-20	24	14	63-MW1-SB-0406 0809 hrs ▽ at 4' 100 ppm		S-2 (14 in.) ~~SILTY~~ SAND, some silt. Fine to med sand tr coarse sand poorly graded Brown. wet. (SM)
6								
7		S-3	12-18 17-23	24	19	63-MW1-SB 0608 0811 hrs 100 ppm		S-3A (7 in) SILTY SAND. Fine to medium, tr coarse sand, poorly graded, Dark Brown (SM)
8								
9		S-4	8-9 9-8	24	17	63-MW1-SB 0810 0818 hrs 0 ppm		S-3B (12 in.) SILTY SAND Fine to med sand poorly graded Brown. (SM)
10								
11		S-5	5-6 7-11	24	17	63-MW1-SB 1012 0825 hrs 5 ppm		S-4 (17 in.) SILTY SAND Fine sand w/ 2 3-in interbeds of Fine and Med Sand, poorly graded. Light brown to brown/tan (SM)
12								
13		S-6	12-14 12-14	24	16	63-MW1-SB 1214 0829 hrs 2 ppm		S-5A (7 in.) SILTY SAND - similar to S-4 w/o interbeds (SM) Stratified
14								
15		S-7	14-18 19-23	24	11	63-MW1-SB 1416 0834 hrs 0 ppm		S-5B (10 in.) SILTY SAND. Fine/Med Sand poorly graded. Brown (Darker than S-A) No stratification observed
16								
17		S-8	12-12 14-11	24	19	63-MW1-SB 1618 0842 hrs 0 ppm		S-6 (16 in.) SILTY SAND Some gravel. Fine sand tr. coarse sand poorly graded; fine subrounded gravel up to 1/4" in length. coarse, subangular and subrounded gravel up to 1 inch in length. Dark brown. (SM)
18								
19		S-9	8-11 14-28	24		63-MW1-SB 1820 0857 hrs 0 ppm		
20								

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:
HSA 4 1/4" ID 8" OD
Cont. sampling 2' increments 2' to w 2" ID barrel
Jar Headspace Readings

DATE: 7-8-94 PROJECT NO.: 1905
PAGE: 1 OF 2 BORING NO.: 63-MW1

BORING LOG

NUMBER/DESIGNATION:

PROJECT: CTU 178 LOCATION: Davisville RI DRILLED BY: EDF - S. LaMarch BORING NO.: 63-MW1

DATE STARTED: 7-8-94 INCLINATION: Vertical LOGGED BY: K Jallut GROUND ELEV.: NM

DATE COMPLETED: 7-8-94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								S-7A (3in) SILT. Dark brown, fine sand-poorly graded. (ML)
								S-7B (8in) SILTY SAND or silt? some gravel Fine sand, poorly graded; coarse subrounded gravel up to 1 1/2" in length fine subrounded gravel up to 1/2" in length Black (SM)
								S-8A (6 in) Silt tr sand; similar to S-7A (ML)
								S-8B (13in) Silty Sand or Silt - some gravel - similar to S-7B (SM)
								S-9 (11in.) Silty Sand or Silt? some gravel Similar to S-8B. Subangular coarse gravel up to 1 1/4" in length, fine subrounded gravel up to 1/4" in length. Black (SM) Subrounded coarse gravel up to 3/4" in length.
								EOB @ 20'. Backfill to 9.5 w/ bent chips and sand. Install sand cushion to 9'. Set well 9' to 4'. See well log.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC. - Length of sample recovered
∇ - Natural ground water level

NOTES: See page 1

DATE: 7-8-94 PROJECT NO.: 1905
PAGE: 2 OF 2 BORING NO.: 63-MW1

BORING LOG

PROJECT: CTO 178 | LOCATION: Danville RT | DRILLED BY: EDI - S. Lanauch | BORING NO.: 71-MW1

DATE STARTED: 7-8-94 | INCLINATION: Vertical | LOGGED BY: K. Jaikut | GROUND ELEV.: NM

DATE COMPLETED: 7-8-94 | BEARING: NM | CHECKED BY: | TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								NO SAMPLES 0-2' NO ASPHALT
1								
2								
3		S-1	4-3 3-4	24	24	71-MW1-SB 0204 1018 hrs 20 ppm		S-1 (24 in) SILTY SAND. Fine sand. tr. med sand poorly graded; 1 piece coarse subrounded gravel up to 3/4" in length. Brown. Some grass. (SM) tr. gravel
4								
5		S-2	4-4 5-5	24	23	71-MW1-SB 0406 1025 hrs 20 ppm		S-2A (9 in) SILTY SAND. Fine sand poorly graded. Grey/Tan. (SM)
6								
7		S-3	6-7 7-9	24	23	71-MW1-SB 0608 1028 hrs 100 ppm		S-2B (10 in) SILTY SAND. Fine to med sand poorly graded. Red-brown. (SM)
8								
9		S-4	11-12 17-21	24	20	71-MW1-SB 0810 1039 hrs 100 ppm		S-2B (4 in) SILTY SAND - similar to S-2A (SM)
10								
11		S-5	4-5 5-7	24	18	71-MW1-SB 1012 1042 hrs 100 ppm		S-3 (23 in) SILTY SAND. Fine sand; poorly graded. Dark brown to grey brown with 1 in interbed of red brown fine sand. (SM)
12								
13		S-6	5-6 7-14	24	19	71-MW1-SB 1214 1045 hrs 100 ppm		S-4 (20 in.) SILTY SAND. Fine sand poorly graded Grey-brown. (SM)
14								
15		S-7	14-10 11-14	24	11	71-MW1-SB 1416 1057 hrs 100 ppm		S-5A (10 in) SILT, ~~tr. sand~~ SANDY. Fine sand poorly graded. (SM). Dark brown.
16								S-5B (8 in.) SILT. tr. sand Grey-Black. Fine sand poorly graded (ML)
17		S-8	9-11 10-12	24	8	71-MW1-SB 1618 1100 hrs 100 ppm		S-6A (11 in.) SILT. Fine grained Brown Soft. (ML)
18								
19		S-9	10-11 20-10	24	4	71-MW1-SB 1820 1117 hrs 100 ppm		S-6B (8 in) SILTY SAND Fine sand poorly graded; interbed of mica (brown). Black (SM)
20								

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; drilling time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
∇ - Natural ground water level

NOTES:
HSA 4 1/4" ID 8" OD
Cont. sampling 2' increments 2'-20' 2" ID split barrel
Jar Headspace Readings
NO PAINT

DATE: 7-8-94 | PROJECT NO.: 1905
PAGE: 1 OF | BORING NO.: 71-MW1

BORING LOG

PROJECT: CTO 179 UST	LOCATION: Dawsonville RE	DRILLED BY: EDI - S. Lambach	BORING NO.: 71-MW1				
DATE STARTED: 7-8-94	INCLINATION: Vertical	LOGGED BY: K. Jalkut	GROUND ELEV.: ? NM				
DATE COMPLETED: 7-8-94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 20'				

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								S-7 (11in.) SILTY SAND & silt some gravel Fine sand poorly graded; coarse subrounded + subangular gravel up to 3/4" in length; fine subrounded and subangular gravel up to 1/2" in length. Black (SM)
								S-8 (12in.) SILT some gravel — similar to above, w/ more silt. Black (ML)
								S-9 (4in) SILT some gravel. similar to S-8. Coarse subangular and subrounded gravel up to 1 1/2" in length, fine subrounded and subangular gravel up to 1/2" in length. Black (ML).
								EOB at 20'. Set well at 19.5' Sand cushion 20-19.5' See Well Log

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water table

NOTES: HSA 4 1/4" ID 8" OD augers
Jar Headspace Readings
Cont. sampling in 2' increments 2'-20'
2" ID split barrel

DATE: 7-8-94 PROJECT NO.: K105
PAGE: 2 OF 2 BORING NO.: 71-MW1

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: US 64 DRILLED BY: C. STAMAS BORING NO.: B-1

DATE STARTED: 7/21/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/21/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0	0						0002 SILTY SAND - ORGANICS & BRICK SOME M.S. + TRACE C.S.
		SS-1	88 75	24		Blow Ct. for 0002		NO SAMPLE
	2		59,29 28,43	24	9"	64-B1-SB 0204 @ 1330.		0204 WET BOT NOT SATURATED 1A - 7" SILTY SAND (SM) MOSTLY F.S., ~~WET~~ SOME SILT SOME ORGANICS DARK BROWN - BLACK. MANY ROOTS & WOODY PIECES. 1B - 2" SAND POORLY GRADED MOSTLY FINE SAND, SOME MED. SAND NO STRUCTURE, OR ORGANICS 1 ROCK FRAG JAMMED IN SPOON @ 6".
	4	SS-2	49,67 65,60	24	16	64-B1-SB 0406 @ 1345		0406 SANDY GRAVEL (GW) MOSTLY SUB-ANGULAR GRAVEL + ROCK FRAGS LARGEST PIECE = 1" WIDE x 2" LONG. SOME MED. - COARSE SAND. TAN + GRAY.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water table

NOTES:
30 33
25 16

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG — **NUS CORPORATION**

PROJECT: CTO-118 LOCATION: UST-64 DRILLED BY: C. STAMAS BORING NO.: B-1

DATE STARTED: 7/21/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/21/94 BEARING: Rim CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	6	SS-3	30, 35, 25, 18	24	8 20	64-B1-SB 0608 @ 1400		0608 - 3A - 13" SAND (SW) MOSTLY M.S., SOME C.S. + TRACE F. GRAVEL NO STRUCTURE OR ORGANICS. BROWN 3B - 7" GRAVELLY SANDY SILT. MOSTLY SILT, SOME GRAVEL (ROUNDED) TRACE F. SAND. DARK GRAY
	8	SS-4	12, 12, 15, 21	24	24	64-B1-SB 0810 @ 1415	4A	0810 4A 12" SIMILAR TO 3A ABOVE NO FINE SAND, M.S. - F. GRAVEL GRAY. 4B = 12" SILTY SAND (SM) MOSTLY U.F.S. WITH SOME SILT. TRACE F. GRAVEL (ROUNDED) SOME BEDDING SEEN, TAN + GRAY. LAYERS.
	10	SS-5	21, 30, 37, 27	24	22	64-B1-SB 1012 @ 1426		1012 5A SIMILAR TO 4A (8") 5B = 14" SIMILAR TO 4B. EOH @ 12'

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST-64 DRILLED BY: C. STAMAS BORING NO.: B-2

DATE STARTED: 7/21/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/21/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	SAMPLE BLOWS PER 6"	SAMPLE PEN. in.	SAMPLE REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							0002 - N.S.
	2	SS-1	6,8 1,30	24	24	64-B2-SB 0204 @ 1525		1A - 20" 0204 SILTY SAND (SM) MOSTLY FINE SAND, SOME M.S. TRACE SILT TRACE GRAVEL (SUB ANGULAR). BROWN. ~1" AREA 7-8" TAN FIBEROUS MINERALS THRU OUT SOIL. 1B - 2" SILTY SAND (SM) ORGANIC RICH. MOSTLY V.F.S. + SOME SILT - WOODY PIECES + ROOTS. BLACK. 1C - 2" OXIDIZED SILTY SAND MOSTLY F.-M. SAND WITH TRACE SILT. ORANGE
	4	SS-2	29 30 18 22	24	16	64-B2-SB 0406 @ 1530		0406 2A - 3" SIMILAR TO ABOVE (1C) 2B - 13" SILTY SAND (SM) MOSTLY V.F.S. WITH SOME SILT, TRACE GRAVEL (SUB-ROUND). DARK GRAY NO ORGANICS WATER IN LOWER 1/2 OF SPOON SATURATED
						▼ @ ~4-5'		
	6	SS-3	13,13 12,12	24	24	64-B2-SB 0608 @ 1540		0608 SATURATED SIMILAR TO ABOVE. GRAVEL UP TO 1" DIAM. SUB-ROUND. DARK GRAY

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer
blows 30" to drive
split barrel sampler;
boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▼ - Natural ground water table

NOTES:

12 14 } 0810 @
16 16 } 1548

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST-64 DRILLED BY: T. DORGAN/R BORING NO.: B-2

DATE STARTED: 7/21/94 INCLINATION: Vertical LOGGED BY: C. STAMAR GROUND ELEV.: NM

DATE COMPLETED: 7/21/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	12,14, 16,14	24	20	64-B2-SB 0810 @ 1548		0810 4-A-10" SILTY SAND (SM) MOSTLY V.F. SAND WITH SOME SILT. TRACE C.S. NO GRAVEL. DARK GRAY. 4B - 10" SILTY SAND (SM) NEARLY ALL V.F.S, TRACE SILT TAN NO COARSE OR GRAVEL.
	10	SS-5	20,22 27,33	24	20	64-B2-SB 1012 @ 1555		1012 5A - 15" SIMILAR TO ABOVE (4B) 5B - 5" SANDY SILT (ML) MOSTLY SILT WITH SOME V.F.S. NO STRUCTURE NO COARSE OR GRAVEL DARK GRAY. EOH @ 12'

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC. - Length of sample recovered
∇ - Natural ground water level

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

PROJECT: LTO 178 | LOCATION: Davisville RI | DRILLED BY: EDI - S. LaMarch | BORING NO.: 65-MW-1

DATE STARTED: 7-8-94 | INCLINATION: Vertical | LOGGED BY: K Jalkut | GROUND ELEV.: NM

DATE COMPLETED: 7-8-94 | BEARING: NM | CHECKED BY: | TOTAL DEPTH: 14.5'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								
1								NO SAMPLES 0-2'
2								
3		S-1	10-11 14-20	24	18	65-MW1-SB-0204 1557 hrs 0ppm		S-1A (9 in) SILTY SAND, tr. gravel. Fine to med sand, poorly graded; 1 piece coarse subrounded gravel up to 1 1/2" in length. Dark brown. (SM)
4								S-1B (9 in) SAND, to trace silt, Fine sand poorly graded. Tan-brown. (SP)
5		S-2	14-17 24-26	24	21	65-MW1-SB-0406 1404 hrs 0ppm		
6								S-2 (21 in.) SILTY SAND tr gravel. Fine sand poorly graded; fine subangular + subrounded gravel up to 1/4" in length, coarse gravel (1 piece) subangular up to 3/4" in length. Brownish-black. Interbed (2 in thick) of brown F/M sand poorly graded. (SM)
7		S-3	21-[illegible] 42-46	24	12	65-MW1-SB-0608 1408 hrs 0ppm		
8								
9		S-4	28-24 24-20	24	18	65-MW1-SB-0810 1452 hrs 0ppm		
10								S-3 (12 in.) SILTY SAND tr gravel. Fine sand tr red sand poorly graded coarse subangular and subrounded gravel up to 1 inch in length, fine subrounded gravel up to 1/2 in in length. Dark brown, Loose-Dry. (SM)
11		S-5	38-34 26-49	24	19	65-MW1-SB 1012 [illegible] hrs 0ppm		
12								
13		S-6	32-37 42-69	24	15	65-MW1-SB 1214 1505 hrs 0ppm		
14								S-4A (6 in.) SILTY SAND tr gravel Fine sand poorly graded, fine subrounded gravel up to 1/4" in length Dark brown, dry, loose. (SM)
15								
16								S-4B (2 in) SILTY SAND F/M sand poorly graded
17								Note: 10 in of sample = rock fragments - broken in spoon.
18								tr. gravel -> fine subrounded up to 1/2" coarse " " " 3/4"
19								mica schist? fine grained igneous diorite?
20								

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Z - Natural ground water level

NOTES:
HSA 4 1/4" ID 8" OD
Continuous soil sampling 2'-2' increments w/ 2" ID barrel

Jar Headspace Readings

DATE: 7-8-94 | PROJECT NO.: 65-MW1
PAGE: 1 OF 2 | BORING NO.: 1

BORING LOG

NUS CORPORATION

PROJECT: CTO 178 LOCATION: Davisville RI DRILLED BY: EDI - S. LaMarch BORING NO.: 65-MW1

DATE STARTED: 7-8-94 INCLINATION: Vertical LOGGED BY: K Jalkut GROUND ELEV.: NM

DATE COMPLETED: 7-8-94 BEARING: NM CHECKED BY: TOTAL DEPTH: 14.5'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								S-5A - 12 in SILTY GRAVEL, some sand. Coarse subangular gravel up to 1" in length; fine subrounded gravel up to 1/4" in length; F/M sand poorly graded. Dark brown saturated @ 10' (GM)
								S-5B (7 in) Gravelly silt. Dark brown to black, coarse subangular gravel up to 1 1/4" in length (GM?) Finer than S-5A
								S-6 (15 in.) SILTY GRAVEL? - mostly broken rock fragments in barrel - cobble? Dark brown to black. Rock is 2" in diameter - width of barrel occupies at least 10" of sample.
								EOB at 14'
								Auger to 14.5 - install 5.5' sand cushion. Set well screen 13-8'. See well log
								based on water on rod when pulled out - ~~the wet to~~ 5' of water on rod

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN. - Penetration length of sampler
REC. - Length of sample recovered
▽ - Natural ground water table

NOTES: HSA 4 1/4" ID augers 8" OD
Continuous soil sampling 2-14'
2' increments w/ 2" ID spoon

See page 1

DATE: 7-8-94 PROJECT NO.: 905
PAGE: 2 OF 2 BORING NO.: 65-MW1

BORING LOG

PROJECT: C10-178 LOCATION: TANK 65 DRILLED BY: C. STAMAS BORING NO.: B-1

DATE STARTED: 7/8/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/8/94 BEARING: CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0	0					START HOLE @ 10:45		0002 - NO SAMPLE
	2	SS-1	16, 18, 20, 19	24	16	65-B1-SB 0204 @ 10:50		0204 SAND (SP) MOSTLY FINE SAND WITH SOME MEDIUM + COARSE SAND ALT. BANDS OF LIGHT + DARK TAN. VERY DRY + LOOSE.
	4	SS-2	7, 15, 20/5"	17	14	65-B1-SB 0406 @ 1102		0406 POOR RECOV. + INCOMPLETE PEN. DUE TO OBSTRUCTION. (WEATHERED MICA-SCHIST FOUND IN NOSE).
						▽ ~6'		2A - 5" SAME AS ABOVE
								2B = 2" ~~MED~~ SAND (SP) MED. TO COARSE TRACE FINES. TAN.
								2C - ~~SAM~~ 5" SAME AS 2A. FINING DOWN.
								2D - NOSE = WET SILTY SAND (SM) MOSTLY FINE SAND WITH TRACE OF SILT. WEATHERED SCHIST IN NOSE.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES: BUILDING W-5 ON SITE MAP HAS BEEN REMOVED
HOT + SUNNY + HUMID COND.

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: ATO-178	LOCATION: TANK 65	DRILLED BY: C. STAMAK	BORING NO.: B-1
DATE STARTED: 7/8/94	INCLINATION:	LOGGED BY: T. DORGAN	GROUND ELEV.: NM
DATE COMPLETED: 7/8/94	BEARING:	CHECKED BY:	TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	6	SS-3	120 FOR 1" / 1"	1"	1/2-1"	65-B1-SB 0608 @ 1110		0608 POOR RECOV. BLOW CT. = 120/1" ~~SA~~ LOOSE SAND (SM) PROB. SLIFED INTO ~~LOOSE~~ BORING 1.5" SUB ROUNDED MICA-SCHIST IN NOSE BRICK FRAGS IN SAND.
	8	SS-4	10,14 21,30	24	4"	65-B1-SB 0810 @ 1123		0810 4" OF ROCK FRAGS + ROCK DUST FROM DRILLING DARK GRY QTZ, MICA SCHIST - FRAGS HAVE SUB-ANGULAR - SUB-ROUNDED SIDES.
	10	SS-5	120/4"	4"		65-B1-SB 1012 @ 1130		1012 4" OF BLACK ROCK FRAGS + DUST. SILTY FINE SAND (SM) DARK GREY - BLACK SCHIST.
								ECH @ 12'

LEGEND:
TYPE-NO. = Type of sample
C = Rock core sample
S = Split barrel sample
BLOWS PER 6" = 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN = Penetration length of sample
REC = Length of sample recovered
Σ = Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

PROJECT: CTO-178 LOCATION: TANK 65 DRILLED BY: C. STAMAS BORING NO.: B-2

DATE STARTED: 7/8/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/8/94 BEARING: CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0		22,					0002 - NO SAMPLE
	2	SS	120/1"	11"	3"	65-B2-SB 0204 @ 1200 ∅ PPM		0204 HARD DRILLING AGAIN. SIMILAR TO B-1 (END). SILTY SAND (SM) MOSTLY FINE SAND WITH TRACE SILT + TRACE MED. SAND. ROCK FRAGS IN NOSE ~1.25" DARK GREY SOIL DARK GREY SCHIST.
	4	SS-2	48, 68, 68, 72	24	15	65-B2-SB 0406 @ 1212 DUP ∅ PPM @ 5-6'		0406 SILTY SAND (SM) ~~SAME AS~~ ~~AS ABOVE~~ MOSTLY FINESAND WITH TRACE SILT + TRACE MED. SAND TRACE COARSE SAND + ROCK FRAGS UP TO 2 INCH. SCHIST. WELL GRADED. BRICK FRAGS
	6	SS-3	70, 120/2"8"			65-B2-SB 0608 @ 12:20		0608 ROCK RECOVERY DUE TO ROCK IN NOSE. ~~SAME~~ SAME AS ABOVE. NO BRICK FRAGS. SCHIST IN NOSE GREY.

11-10
10-12

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive 1 split barrel sampler; drilling time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
∇ - Natural ground water table

NOTES: STARTED BORING @ 1155.

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG: **NUS CORPORATION**

PROJECT: CTO-178 LOCATION: TANK 65 DRILLED BY: C. STAMAS BORING NO.: B-2

DATE STARTED: 7/8/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/8/94 BEARING: CHECKED BY: TOTAL DEPTH: 12'

ELEV feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	14,36, 40,30	24	16	65-B2-SB 0810 @ 1225		0800
								4A - 4" SILTY SAND (SM) MOSTLY FINE SAND WITH SOME SILT & BRICK FRAGS
								4B - 12" SAND (SW) WELL GRADED, POORLY SORTED FINE - COARSE SAND + FINE GRAVEL. BRICK FRAGS GRAVEL SUB ROUND UP TO 2" DIAM.
	10	SS-5	40,28 37,40	24	14	65-B2-SB 1012 @ 1235		1012
								5A - 6" SAND (SP) POORLY GRADED SAND FROM FINE - COARSE MOSTLY MEDIUM. TAN - GREY - NO GRAVEL.
								5B - 8" SAND (SP) MOSTLY MED. SAND WITH TRACE FINES. SOME COARSE. GRAVEL UP TO 1.5' SUBROUNDED. TAN + GREY.
								EOH @ 12'

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

UST AREA D2

BORING LOG.

PROJECT: CTO 178	LOCATION: Danville RI	DRILLED BY: PDI - S. Lamarch	BORING NO.: 10 - MW1
DATE STARTED: 7-11-94	INCLINATION: Vertical	LOGGED BY: K. Talbot	GROUND ELEV.: NM
DATE COMPLETED: 7-12-94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 14'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							NO SAMPLES 0-2' ASPHALT
	1							
	2							
	3	S-1	4-4 4-4	24	18	10-MW1-SB-0204 1534 hrs 35 ppm		S-1 (18in) SILTY SAND Fine sand; poorly graded; Brown. (SM)
	4							
	5	S-2	3-3 3-3	24	18	10-MW1-SB 0406 1539 hrs 250 ppm		S-2A (5in) SILTY SAND - similar to S-1 (SM) Brown.
	6							
	7	S-3	3-4 3-4	24	4 14	10-MW1-SB 0608 1543 hrs ▽@ 8'?? 15 ppm		S-2B (13in) SILTY SAND tr gravel. Fine sand poorly graded; fine subrounded gravel/pebbles up to 1/4 in in length; rock fragments; petroleum odor. Dark brown to grey. (SM)
	8							
	9	S-4	5-8 8-10	24	24	10-MW1-SB 0810 1546 hrs 5 ppm		S-3A (4in) SILTY SAND. Fine Sand poorly graded. Brown (SM)
7-11	10							
7-12	11	S-5	5-7 11-13	24	21	10-MW1-SB-1012 0730 hrs 2 ppm		S-3B (5in) GRAVELLY SILTY SAND. F/M sand; poorly graded, coarse subrounded gravel up to 1"4" in length; fine subrounded gravel up to 1/2" in length Grey-black (SM)
	12							
	13	S-6	7-7 9-12	24	24	10-MW1-SB-1214 0734 hrs 3 ppm		S-3C (5in) SAND, tr. silt F/M sand poorly graded; Brown. (SP)
	14							
	15							
	16							S-4 (24in) SAND tr. silt F/M sand - poorly graded Brown similar to S-3. (SP)
	17							
	18							S-5 (21in.) SAND tr. silt F/M tr. coarse sand poorly graded. Brown w/ red mottling near base of spoon (SP).
	19							
	20							

Void (TB)

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN. - Penetration length of sample
REC. - Length of sample recovered
▽ - Natural ground water level

NOTES:
HSA 4 1/4" ID 8" OD
Continuous Soil Sampling 2' to
w/ 2" ID barrel in 2' increments
Jar Headspace Readings

DATE: 7-12-94 PROJECT NO.: 1905
PAGE: 1 OF 2 BORING NO.: 10-MW1

BORING LOG

PROJECT: CTO 178 LOCATION: Danville KY DRILLED BY: EDI - S. Lamarch BORING NO.: 10-MW1

DATE STARTED: 7-11-94 INCLINATION: Vertical LOGGED BY: K. Laikut GROUND ELEV.: NM

DATE COMPLETED: 7-12-94 BEARING: NM CHECKED BY: TOTAL DEPTH:

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								S-6A (17in.) SAND tr. silt, Fine to medium sand poorly graded brown (SP)
								S-6B (21in) SAND tr. silt. Fine sand tr. medium sand poorly graded Grey-brown (SP)
								S-6C (5in) Gravelly silt sand. Fine sand tr med sand poorly graded; coarse subangular and subrounded gravel up to 1 inch in length; fine subrounded gravel up to ½ in in length (GM)
								EOB @ 14'. Augers to 14' backfill w/ bent chips + sand 14-12.5', sand 12.5-12'. Set well 12-7'. See well log

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; - coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
Ⅴ - Natural ground water table

NOTES:

See page 1

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG:

NUS CORPORATION

PROJECT: CTO-178 LOCATION: Daviesville RF DRILLED BY: EDI - S. Gonzalez BORING NO.: 10-MW2

DATE STARTED: 7-12-94 INCLINATION: Vertical LOGGED BY: K Jalkut GROUND ELEV.: NM

DATE COMPLETED: 7-12-94 BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								ASPHALT 2" NO SAMPLES 0-2'
1								
2								
3		S-1	9-11 13-13	24	18	10-MW2-SB-0204 0915 hrs 0 ppm		S-1A (4in) SILTY SAND; tr. gravel. Fine sand poorly graded; fine subrounded gravel up to 1/4" in length; rock fragments. Grey-brown (SM).
4								
5		S-2	9-7 11-11	24	17	10-MW2-SB-0406 0924 hrs @ 5-6' 2 ppm		S-1B (6in.) SILTY SAND, some gravel. Fine sand tr med sand; coarse subrounded poorly graded gravel up to 1 1/2" in length, fine subrounded gravel up to 1/2" in length. Brown. Dry; loose. (SM)
6								
7		S-3	9-6 8-8	24	29	10-MW2-SB-0608 0929 hrs 10 ppm		S-1C (8in.) GRAVELLY SILTY SAND. Fine sand to med sand poorly graded; coarse subangular gravel up to 1 3/4" in length; fine subrounded and subangular gravel up to 1/2 in. in length. Grey-brown (GM). Dry; loose
8								
9		S-4	3-3 3-4	24	11	10-MW2-SB-0810 0936 hrs 5 ppm		
10								
11		S-5	5-5 5-6	24	19	10-MW2-SB 1012 0942 hrs. 5 ppm		S-2A (9in) SILTY SAND some gravel. Fine sand tr. med sand poorly graded; fine subrounded gravel up to 1/2 in in length. Grey-brown (SM)
12								S-2B (8in) SAND tr. silt tr. gravel. F/M sand tr. coarse sand poorly graded. 1 piece coarse subrounded gravel up to 3/4" in length. Brown wet. (SP)
13		S-6	6-6 7-9	24	23	10-MW2-SB 1214 0945 hrs 5 ppm		
14								S-3 (24in) SAND tr silt tr gravel F/M sand tr. coarse sand poorly graded; fine subrounded gravel up to 1/8". Brown wet. (SP)
15		S-7	8-10 14-32	24	23	10-MW2-SB 1416 0952 hrs 2.5 ppm		
16								S-4 (11in.) SAND tr. silt - similar to S-3 (SP) Brown.
17		S-8	32-41 16-14	24	11	10-MW2-SB 1618 1004 hrs 1.2 ppm		S-5 (19in) SAND tr. silt F→C sand well graded. Brown (SW).
18								S-6A (14in) SAND tr. silt - similar to S-5 (SP)
19		S-9	5-5 6-5	24	8	10-MW2-SB 1820 1016 hrs 1 ppm		S-6B (5in) SAND tr. silt - Fine sand poorly graded. Brown to tan. (SP)
20								S-6C (4in) SAND tr silt - F/M sand PG; tr gravel coarse subrounded gravel (2 pieces) up to 1 1/2 inches. Brown (SP) fine SR gravel up to 1/2 in.

TPH SAMPLES

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:
HSA 4 1/4" ID ~~to~~ 8" OD
Cont. sampling 2'-
Jar Headspace Readings w/OVA
2' increments w/2" ID spoon

DATE: 7-12-94 PROJECT NO.: 1905
PAGE: 1 OF 2 BORING NO.: 10MW2

BORING LOG — **NUS CORPORATION**

PROJECT: CTO 178	LOCATION: Danville PA	DRILLED BY: ED I - S. Cawlarch	BORING NO.: 10 - MW2
DATE STARTED: 7-12-94	INCLINATION: Vertical	LOGGED BY: K. Jalbert	GROUND ELEV.:
DATE COMPLETED: 7-12-94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								S-7A (19 in) SAND tr. silt F/M tr coarse sand, poorly graded; Brown. (SP)
								S-7B (4 in) Gravelly silty sand: fine sand poorly graded: coarse subangular and subrounded gravel up to 1 1/4 in in length; rock fragment (baked in spoon); fine subrounded gravel up to 1/4 in in length. Grey-Black. (GM).
								S-8 (11 in) Gravelly Silt tr. sand. Fine sand; angular rock fragments (broken gravels) up to 1 1/2 in. in length. ~~Dark~~ Black. (GM)
								S-9 (8 in) SILT, tr. clay, tr. gravel tr. sand. Fine sand poorly graded; (piece) coarse subangular gravel up to 3/4" in length; fine subrounded gravel up to 1/2" in length — much less gravel than S-8. (ML).
								EOB at 20'. Augers to 20'. Backfill to 16.5 w/ bent chips + sand 16.5-16 w/sand. Set well 16 to 6 FT. See well log

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES: See page 1

DATE: 7-12-94 PROJECT NO.: 1900
PAGE: 2 OF 2 BORING NO.: 10-MW2

UST AREA E

BORING LOG

PROJECT: CTC 17K UST Upgrade LOCATION: Danville RI DRILLED BY: EDI - S. LaMarca BORING NO.: 68-MW1

DATE STARTED: 7-11-94 INCLINATION: vertical LOGGED BY: K. Jackert GROUND ELEV.: N/M

DATE COMPLETED: BEARING: N/M CHECKED BY: TOTAL DEPTH: 20

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							NO SAMPLES 0-2'
	1							
	2							
	3	S-1	9-10 12-10	24	18	68-MW1-SB-0304 1017 hrs > 1000 ppm		S-1A (8in) SILTY SAND. Fine sand poorly graded; root matter. Brown (tan) (SM)
	4							S-1B (10in) SAND, ~~tr.~~ some silt tr gravel Fine tr. med sand poorly graded; 1 piece fine subrounded gravel up to 1/2 in in length. Grey-brown Petroleum odors (SM)
	5	S-2	2-2 2-2	24	15	68-MW1-SB-0406 ▽ Qy's 1018 hrs 450 ppm		
	6							S-2A (8in) SAND, ~~tr.~~ some silt tr gravel - Similar to S-1B (SM)
	7	S-3	4-5 5-5	24	20	68-MW1-SB-0608 1022 hrs 80 ppm		
	8							S-2B (5in) SAND, tr. silt Fine sand poorly graded; Stratified; reddish brown (SP)
	9	S-4	4-5 7-7	24	24	68-MW1-SB-0810 1025 hrs 4 ppm		
	10							S-3A (9in) ~~STIFF~~ SAND some silt tr gravel fine tr. med sand poorly graded; 1 piece fine subrounded gravel up to 1/4" in length - grey brown (SM)
	11	S-5	4-5 8-9	24	13	68-MW1-SB 1012 1035 hrs 1.5 ppm		
	12							S-3B (9in) SAND, tr. silt. tr gravel F/m sand tr. coarse sand; poorly graded; 1 pce fine subrounded gravel up to 1/4" in length Brown (SP)
	13	S-6	12-9 14-14	24	24	68-MW1-SB 1214 1040 hrs 10 ppm		
	14							S-3C (7in) SAND tr. silt Fine sand poorly graded Light grey-brown (SP)
	15	S-7	18-21 23-23	24	20	68-MW1-SB-1416 1053 hrs 5 ppm		
	16							S-4A (7in) SAND tr. silt F/m sand poorly graded Brown (SP)
	17	S-8	11-7 6-7	24	24	68-MW1-SB 1618 1057 hrs 15 ppm		S-4B (17in) SAND tr. silt Fine sand Grey-brown poorly graded (SP)
	18							
	19	S-9	4-5 7-9	24	20	68-MW1-SB 1820 1100 hrs 3 ppm		
	20							

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
HSA 4 1/4" ID 8" OD
Continuous soil sampling 2'-20'
2' increments 2" ID spoon

Jar Headspace Technique

DATE: 7-11-94 PROJECT NO.: 1905
PAGE: 1 OF 2 BORING NO.: 68-MW1

BORING LOG NUS CORPORATION

PROJECT: CTD 178 LOCATION: Dunlo RI DRILLED BY: LD-S. Lania BORING NO.: 106-MW1

DATE STARTED: 7-11-94 INCLINATION: vertical LOGGED BY: K Jallat GROUND ELEV.: NM

DATE COMPLETED: BEARING: NM CHECKED BY: TOTAL DEPTH: 20'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								S-5 (13in.) SAND, some silt. Fine sand poorly graded. Stratified Grey-brown (SM)
								S-6 (24in.) SILTY SAND. Fine sand. poorly graded; stratified/bedded brown. Interbeds of silt (1" thick) (SM)
								S-7A (10in) SAND tr. silt F/M sand poorly graded Brown (SP)
								S-7B (10in) Gravelly silty sand. F/M tr. coarse sand; coarse subrounded gravel up to 1in in length; fine subrounded gravel up to 1/2" in length. Greyish brown (GM). poorly graded
								S-8 (24in) Gravelly silty sand - similar to S-7B (GM) Interbed of silty fine sand - 4in thick - grey/black (~~GM~~ SM)
								S-9 (20in.) SAND tr. silt Fine sand tr. red sand poorly graded, interbed of silty fine sand (SM) Red mottling at base of split barrel (SP/SM)
								EOB at 20'. Augers to 20'. Set well at ~~14.5-6.5~~ 10-4. See well log. Sand cushion ~~10-10.5~~ 10.5-10

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
See page 1
HSA 4 1/4" ID 7" OD

backfill w/ bent chips + sand to 10.5

DATE: 7-11-94 PROJECT NO.:
PAGE: 2 OF 2 BORING NO.:

BORING LOG

PROJECT: CTC17E	LOCATION: D'ville 125	DRILLED BY: CDI - S. Lawrence	BORING NO.: 68-B1
DATE STARTED: 7-11-94	INCLINATION: vertical	LOGGED BY: K. Walkut	GROUND ELEV.: N/A
DATE COMPLETED: 7-11-94	BEARING: N/A	CHECKED BY:	TOTAL DEPTH: 12'

NUS CORPORATION

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								NO SAMPLES 0-3'
1								
2								
3		S-1	4-6 7-7	24	24	68-B1-SB-0204 0847 hrs. 150 ppm		S-1 (24in) SAND tr silt. Fine sand, tr med sand, poorly graded; root matter. Grey-brown. (SP)
4								
5		S-2	4-4 6-7	24	14	68-B1-SB 0406 0855 hrs 20 ppm		S-2A (6in) Similar to S-1 (SP) wet.
6								
7		S-3	4-6 6-4	24	17	68-B1-SB 0608 0905 hrs 5 ppm		S-2B (7in) SAND, tr. silt Fine sand tr. med sand poorly graded. Brown. wet (SP)
8								
9		S-4	9-10 12-10	24	14	68-B1-SB 0810 0920 hrs 60 ppm		S-3 (17in) SAND tr. silt, tr. gravel Fine sand tr. med sand poorly graded a few pieces fine subrounded gravel up to 1/4" in length. Reddish brown mottling at 12-14" (2" thick). Grey brown. (SP)
10								
11		S-5	6-6 9-7	24	17	68-B1-SB 1012 0935 hrs. 5 ppm		S-4 (14in) SAND tr silt Fine sand tr. med sand poorly graded Grey-brown / Interbed of grey silty sand (fine grained) 2" thick Brown fine sand w/ red mottling or staining under silt (8). (SP-SM)
12								
13		S-6						
14								
15		S-7						
16								
17		S-8						S-5A (10in) SAND tr. silt, tr. gravel Fine to med sand poorly graded, coarse gravel up to 1/4" subrounded Grey-brown (SP)
18								
19		S-9						S-5B (7in) SAND tr. silt Fine sand well graded; fine subrounded gravel up to 1/4" in length (SW) Red brown.
20								

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
HSA 4 1/4" ID 8" OD
Continuous soil sampling 2' to
w/ 2' Sampler 3" ID
Jar Headspace for samples
Bottom @ 12' backfill w/ bent. slurry. to 2' sand to 2' same to 0'

DATE: PROJECT NO.:
PAGE: 1 OF 1 BORING NO.: 68-B1

BORING LOG.

NUS CORPORATION

PROJECT: [illegible] LOCATION: Divine KT DRILLED BY: [illegible] BORING NO.: [illegible]

DATE STARTED: 7-11-94 INCLINATION: Vertical LOGGED BY: K Talbot GROUND ELEV.: N/A

DATE COMPLETED: 7-11-94 BEARING: N/A CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							
	1							
	2							
	3	S-1	6-7 7-11	24	15	68-B2-SB-0204 1313 hrs 100-200 ppm		S-1 (7 in) SILTY SAND, ~~some silt~~, tr. gravel Fine sand poorly graded; coarse gravel up to 3/4" in length subrounded, fine subrounded gravel up to 1/4" in length. Grey-brown (SM)
	4							
	5	S-2	5-7 7-8	24	10	68-B2-SB-0406 1321 hrs Grinding slot 150 ppm		S-2 (10 in) SILTY SAND Fine sand poorly graded. Grey-brown (SM) Rock fragment - lodged in spoon.
	6							
	7	S-3	7-6 12-13	24	2"	68-B2-SB-0408 1329 hrs 0 ppm		S-3A (8 in) SILTY SAND Fine sand tr. med sand poorly graded Grey-brown (SM)
	8							
	9	S-4	3-5 8-8	24	12	68-B2-SB-0810 1334 hrs 0 ppm		S-3B (15 in) SAND tr ~~some~~ silt Fine sand ~~trace~~ some poorly graded Brown (SP)
	10							
	11	S-5	5-7 7-8	24	24	68-B2-SB-1012 1340 hrs 915 ppm		S-4 (12 in) ~~SILTY~~ SAND tr. silt Fine sand tr. med/coarse sand. Red-brown staining poorly graded (SP)
	12							
	13							S-5A (6 in) SAND tr. silt - similar to S-4 Reddish brown (SP)
	14							
	15							S-5B (18 in) SILTY SAND Fine sand poorly graded Dark grey-stratified (SM)
	16							EOB @ 12' Backfilled w/ bent slurry + sand to 2'; sand to 0'
	17							
	18							
	19							
	20							

UOID

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; cutting time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
~~Seg~~
HSA 4 1/4" 8" OD
ID
2' increments 2" ID spoon

Jar headspace reading
Cont. sampling 2'-

DATE: PROJECT NO.:
PAGE: 1 OF BORING NO.:

UST AREA F1

BORING LOG — **NUS CORPORATION**

PROJECT: 110-178	LOCATION: OST-25	DRILLED BY: C. STAMAR	BORING NO.: MW1
DATE STARTED: 7/20/94	INCLINATION: Vertical	LOGGED BY: T. DORGAN	GROUND ELEV.: NM
DATE COMPLETED: 7/20/94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 31'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	30, 24, 12/3"	15"	15"	25-MW1-SB 0810 @ 0838 .2 PPM		0810 SILTY SAND (SM) + GRAVEL. MOSTLY F.S. WITH SOME SILT AND SOME SUBANGULAR GRAVEL + ROCK FRAGS. DARK GRAY.
	10	SS-5	40, 51, 40, 50	24	24	25-MW1-SB 1012 @ 0850 .5 PPM		1012 SIMILAR TO ABOVE, BUT VERY TIGHT. IRON RICH NODULES BRICK COLORED 1/16-1/4" DIAM. NOTED THRUOUT FROM 14-19" IN SPOON, ROCK FRAGS ONLY. (DARK GREY MICA SCHIST).
	12	SS-6	34, 36, 29, 30	24	10"	25-MW1-SB 1214 @ 0858 .8 PPM		1214 SIMILAR TO ABOVE INCLUDING BRICK COLORED NODULES. SAMPLE IS DAMP, BUT NOT SATURATED. PROBABLY HOLDING H_2O DUE TO GRAIN SIZE.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
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BORING LOG

NUS CORPORATION

PROJECT: MD-178 LOCATION: US-25 DRILLED BY: C. STAMAS BORING NO.: MW-1

DATE STARTED: 7/20 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/20 BEARING: NM CHECKED BY: TOTAL DEPTH: 31'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	14	SS-7	20, 26, 28, 29	24"	14"	25-MW1-SB 1416 @ 0905 .2 ppm		1416 7A-4" SIMILAR TO ABOVE. 7B-10" DRY SAND (SW) MOSTLY MED. TO COARSE SAND WITH TRACE ROUNDED F. GRAVEL. VERY DRY, TRACE F.S. SOME LAYERING, TAN OVER GRAY.
	16	SS-8	20 26 30 35	24"	17"	25-MW1-SB 1618 @ 0915 .2 ppm		1618 SIMILAR TO 7B ABOVE. TRACE GRAVEL UP TO 1" ROUNDED. STILL DRY ALTERNATING ~2" THICK LAYERS LOOSE GRAY + TAN.
	18	SS-9	11, 25, 24, 18	24"	8"	25-MW1-SB 1820 @ 0920 ▽ ~20' .2 ppm		1820 POOR RECOVERY SIMILER TO ABOVE, NEAR SATURATION IN NOSE. HARD GUESS @ ▽ DUE TO POOR RECOVERY ~18-20, BUT PROB. NEARER TO 20'.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:

DATE: PROJECT NO.:
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BORING LOG — **NUS CORPORATION**

PROJECT: CTO-178 LOCATION: UST-25 DRILLED BY: C. STAMATS BORING NO.: MW1

DATE STARTED: 7/20/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/20/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 31'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	20	SS-10	6,9 11,7	24	17"	25-MW1-SB 2028 @ 0930 .8ppm		2028 FULLY SATURATED SIMILAR TO ABOVE, LESS GRAVEL = ROUNDED ~ 1/2" DIAM.
	22	SS-11	7,9 10,10	24	24	25-MW1-SB 2224 @ 0935 1.5ppm		2224 SIMILAR TO ABOVE GRAY + TAN.
	24	SS-12	7,12 14,15	24	20"	25-MW1-SB 2426 @ 0938 1 PPM		2426 12A-12" SIMILAR TO ABOVE FINING DOWN. 12B-8" SILTY SAND (SM) MOSTLY VF SAND WITH SOME SILT. GREY, NO STRUCTURE.
	26	SS-13	9,13 22,25	24	16"	25 MW1-SB 2628 @ 0943 1.8PPM		2628 SIMILAR TO 12B ABOVE

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:

11 @ 0950
45
2635

DATE: PROJECT NO.:
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BORING LOG

NUS CORPORATION

PROJECT: OTO 176 LOCATION: UST 25 DRILLED BY: C STOMAS BORING NO.: MW4

DATE STARTED: 7/20/94 INCLINATION: Vertical LOGGED BY: T DORLAN GROUND ELEV.: NM

DATE COMPLETED: 7/20/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 31'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	28	SS-14	1,1 4,5	24	20	25-MW1-SB 2830@ 0948		2830 SIMILAR TO ABOVE
						.7PPM		
								EOH @ 31'
								WELL = 1' SAND SCREEN 30'-20'
								LAB SAMPLES = 2628 2830

LEGEND:
TYPE-NO. = Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Z - Natural ground water level

NOTES:

DATE: PROJECT NO.:
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BORING LOG — **NUS CORPORATION**

PROJECT: CTO-178 LOCATION: 1ST-25 DRILLED BY: C. STAMAS BORING NO.: B9-1

DATE STARTED: 7/19-94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7-19-94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0		7,9 12,12					0002 - N.S.
	2	SS-1	↓	24	21"	25-B1-SB 0204 @ 1412 Ø PPM		0204 SAND (SP) MOSTLY FINE SAND WITH TRACE M.S. + TRACE FINE GRAVEL. BROWN, NO ORGANICS, GRAVEL IS SUB-ANGULAR
	4	SS-2	6,6 8,10	24	9"	25-B1-SB 0406 @ 1418 Ø PPM		0406 SILTY SAND (SM) MOSTLY FINE SAND WITH TRACE SILT. 1 PIECE 2" GRAVEL SUB-ROUND. TAN + GRAY
	6	SS-3	14,22 24,28	24	16"	25-B1-SB 0608 @ 1425 .2 PPM		0608 (DUP) 3A - 6" SIMILAR TO ABOVE, TAN 3B - 10" SAND (SP) NEARLY ALL F.S. + V.F. SAND WITH TRACE M.S. GRAY. TRACE ROCK FRAGS.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:

14.22 24 28 @ 1425

DATE: PROJECT NO.:
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BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST-25 DRILLED BY: C. STAMAS BORING NO.: B-1

DATE STARTED: 7/19/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7-19-94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	SAMPLE BLOWS PER 6"	SAMPLE PEN. in.	SAMPLE REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	18,25 25,26	24	24	25-B1-SB 0810 @ 1440 Ø7PM		0810 SILTY FINE SAND (SM) MOSTLY F.S. WITH SOME SILT. 12" TAN OVER 12" GREY TRACE SUB-ANGULAR GRAVEL ~ 1/2" DIAM.
	10	SS-5	22,29 70,36	24		25-B1-SB 012 @ 1447		1012 SIMILAR TO ABOVE, GREY. ~50% GRAVEL & ROCK FRAGS UP TO 2". SMOKY QTZ. + SCHIST. FINE SDS ARE MOIST.

14-BARREL RINSATE
15-SCUTDLA
1508
1511

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Ⅴ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
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BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST - 25 DRILLED BY: C. STAMAS BORING NO.: B2

DATE STARTED: 7/20/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/20/94 BEARING: N/A CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							0002 - N.S. START @ 1110
	2	SS-1	8, 28, 14, 8	24	16"	25-B2-SB 0204 @ 1115 ∅ ppm		0204 - SILTY SAND (SM) PREDOM. V.F. SAND - WITH SOME MED. SAND + TRACE SILT - TRACE FINE GRAVEL - SUB-ANGULAR. LIGHT TAN
	4	SS-2	8, 12, 30, 36	24	15"	25-B2-SB 0406 @ 1125 0.8 ppm		0406 2A - 2" SAME AS ABOVE 2B - 13" SILTY SAND & GRAVEL (SM) MOSTLY GRAVEL & ROCK FRAGS, SOME F. SAND WITH TRACE SILT. DARK GRAY
	6	SS-3	120/5"	5"	2"	25-B2-SB 0608 @ 1134 2.2 ppm		0608 - POOR RECOVERY - HEAD SPACE ONLY SAMPLE LOOKS LIKE TOP SAMPLE, PROB. CONTAMINATED FROM TOP OF HOLE, NOT REAL INTERVAL.
	8	SS-4	120/5"	5"	4"	25-B2-SB 0810 @ 1145 1.2 ppm		0810 - POOR RECOVERY - 2" MED. SAND SIMILIAR TO ABOVE (SS-3). 4B - 2" SILTY SAND (SM) MOSTLY F.S. TRACE SILT GREY TRACE F. GRAVEL SUB-ROUND.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC. - Length of sample recovered
∇ - Natural ground water table

NOTES:

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BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST-25 DRILLED BY: C. STAMPS BORING NO.: B-2

DATE STARTED: 7/20/94 INCLINATION: Vertical LOGGED BY: T-DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/20/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	10	~~SS~~ 5	12, 15, 20, 28	24	16	25-B2-SB 1012 @ 1155 .4 PPM		1012 DUP-8 SILTY SAND (SM) MOSTLY F.S. WITH SOME SILT + BSS. TRACE CLAY. TRACE F. GRAVEL. WET DARK GRAY.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive
S: split barrel sampler;
C: boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Ⅴ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
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BORING LOG

PROJECT: CTO-178 LOCATION: UST 25 DRILLED BY: C. STAMAS BORING NO.: B-3

DATE STARTED: 7/20/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/20/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0		120					0002 - N.S.
	2	SS-1	FOR 5"	24	4"	25-B3-SB 0204 @ 1250 3.5 PPM		0204: SILTY SAND (SM) MOSTLY FINES AND WITH TRACE SILT. TRACE F. GRAVEL SUB-ANGULAR. VOA ONLY NO TPH
	4	SS-2	12,20 18,16	24	17"	25-B3-SB 0406 @ 1310 .2 PPM		0406 2A - 10" - SILTY SAND (SM) MOSTLY V.F. SAND WITH ~~SOME~~ TRACE SILT + SOME GRAVEL, UP TO 1 3/8" DIAM. ROCK FRAGS. TAN. 2B - 7" SILTY SAND (SM) V.F. SAND SOME SILT, TRACE GRAVEL - SUB ANGULAR DARK GRAY.
	6	SS-3	50 21 30 26	24	14"	25-B3-SB 0608 .2 PPM 1320		0608 SIMILAR TO ABOVE 2B ROCK FRAGS (QTZ) GRAVEL ~ 1" MAX. LENGTH.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water level

NOTES:

DATE: PROJECT NO.:
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BORING LOG:

PROJECT: PTO-178 LOCATION: USI - 25 DRILLED BY: C. STAMAR BORING NO.: B-5

DATE STARTED: 7/20/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/20/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	13, 33, 35, 33	24	15	25-B3-SB 0810 @ 1328 .5ppm		0810 SIMILAR TO ABOVE, MOIST MANY OXIDIZED PODS ~1/16" ROCK ACROSS SPOON @ 12" BROKEN FRAGS.
	10	SS-5	20, 32, 41, 45	24	13	25-B3-SB 1012 @ 1335 .2ppm		1012 SIMILAR TO ABOVE BROKEN ROCK FRAGS IN NOSE SCHIST.

EOH @ 12'

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN. - Penetration length of sample
REC. - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
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BORING LOG — **NUS CORPORATION**

PROJECT: CTD-178	LOCATION: US-60	DRILLED BY: C. STAMAS	BORING NO.: MW-1
DATE STARTED: 7/19/94	INCLINATION: Vertical	LOGGED BY: T. DORGAN	GROUND ELEV.: NM
DATE COMPLETED: 7-19-94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 31'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								BEGAN HOLE @ 0945.
	0		CONCRETE					0002 - N.S.
	2	SS-1	12,15 20,7	24	11"	66-MW1-SB 0204 @ 0958		DRILLED THRU CONCRETE WITH DEDICATED BIT. 0204 SILTY SAND (SM) MOSTLY M.S. WITH TRACE F.S. + TRACE SILT. SOME GRAVEL ~1.5" DIAM + ROCK FRAGS. DARK BROWN. NO ORGANICS.
	4	SS-2	15,25 120 FOR 5"	17"	12"	66-MW1-SB 0406 @ 1012		0406 ROCK IN NOSE. SILTY FINE SAND (SM) MOSTLY FINE SAND WITH SOME SILT. WET, BUT NOT SATURATED. TRACE FINE GRAVEL + ROCK FRAGS. DARK GREY + OXIDIZED AREAS.
	6	SS-3	15,23 27,30	24	24	66-MW1-SB 0608 @ 1030		0608 DAMP, NOT WET. 3A-8" SIMILAR TO ~~ABOVE~~ HAS SOME FINE GRAVEL + ROCK FRAG. 3B-16" SAND (SW) MOSTLY M.S. WITH TRACE F.S. + SOME GRAVEL UP TO 1" DIAM ROUNDED. BROWN + GRAY

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water level

NOTES: MW-1 - ON OLD TANK 66 GRAVE. THRU CONCRETE PATCH. B-1(66) - ~50' W.NW OF MW1 X-GRADIENT.

14 22
23 25

DATE: PROJECT NO.:
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BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST-66 DRILLED BY: STAMAR BORING NO.: MW-1

DATE STARTED: 7/19/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/19/94 BEARING: NW CHECKED BY: TOTAL DEPTH: 30'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	8	SS-4	18 22 23 25	24	17"	66-MW1-SB 0810 @ 1035		0810 SIMILAR TO 3B. WITH TRACE C. SAND. MANY ROCK FRAGS + GRAVEL.
	10	SS-5	23, 22 19, 25	24	16"	66-MW1-SB 1012 @ 1050		1012 SIMILAR TO ABOVE. POORLY SORTED MIXTURE OF SAND + GRAVEL. w/ ROCK FRAGS. DRY.
	12	SS-6	19, 23 22, 25	24	17"	66-MW1-SB 1214 @ 1055		1214 SIMILAR TO ABOVE, LESS GRAVEL, POOR GRADING. MOSTLY MED. COARSE SAND. DAMP.
	14	SS-7	6, 9 7, 7	24	14	66-MW1-SB 1416 @ 11:05		1416 13" 7A- SIMILAR TO ABOVE, FINING. 7B - 1" SAND (SP) MOSTLY MED. SAND WITH SOME FINE SAND LT. TAN. NO STRUCTURE. DAMP.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
SS - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN. - Penetration length of sampler
REC. - Length of sample recovered
▽ - Natural ground water level

NOTES:

9 9 10 12 16 18 14 19 16 18 14 5 11 15 7

DATE: PROJECT NO.:
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BORING LOG — **NUS CORPORATION**

PROJECT: CTO-178	LOCATION: UST-66	DRILLED BY: C. STAMAS	BORING NO.: MW-1
DATE STARTED: 7/19/94	INCLINATION: Vertical	LOGGED BY: T. DURGAN	GROUND ELEV.: NM
DATE COMPLETED: 7/19/94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 31'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	16	SS-8	9,9 10,12	24	17"	66-MW1-SB 1618 @ 1107		1618 SIMILAR TO ABOVE WET, BUT NOT SAT. TAN. LAST 1" = OXIDIZED ORANGE.
	18	SS-9	18,19 16,18	24	18"	66-MW1-SB 1820 @ 1115		1820 9A-21" SIMILAR TO ABOVE WET. NEAR SATURATION. 9B-16" - SILTY FINE SAND (SM) TAN - SOME BEDDING MOSTLY FINE SAND WITH TRACE SILT. NOTHING COARSER. ~~EOH @ 20' T.D.~~ ~~WL @ 19.5' 9.5'~~
	20	SS-10	7,8 11,15	24	15	66-MW1-SB 20-22 @ 1155		2022 SIMILAR TO ABOVE, WITH BEDDING - SATURATED. ▽ ~20.5'-21'

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES: ▽ NOT TRULY FOUND - CHECKED WELL MW-6 ACCROSS STREET ~100' + 5' LOWER ELEV. W.L. ~21'. NEAR LEACH FIELD. EXTRA SPOON BEING TAKEN TO SAMPLE @ W.T.

DATE: _____ PROJECT NO.: _____
PAGE: _____ OF _____ BORING NO.: _____

BORING LOG

PROJECT: STO-178 LOCATION: UST-66 DRILLED BY: C. STAMPS BORING NO.: MW-1

DATE STARTED: 7/19/94 INCLINATION: Vertical LOGGED BY: T. DARGAN GROUND ELEV.: NM

DATE COMPLETED: 7/19/94 BEARING: NN CHECKED BY: TOTAL DEPTH: 31

ELEV. feet	DEPTH feet	SAMPLE: TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
								AS ▼ WAS NOT FOUND IN 20', IT WAS DECIDED TO CONTINUE DRILLING PAST 20'. WELL MW-6 ACROSS THE STREET WAS OPENED + SHOWED WATER @~21'. IT WAS DECIDED TO DRILL TO 31', BUT NOT TO SAMPLE PAST 20'. I UNDERSTOOD THAT TO MEAN DRILL WITHOUT LOGGING THE WELL DOWN TO 31'. BY THE TIME I THOUGHT TWICE ABOUT IT + KATHLEEN CALLED TO CLARIFY, THE DRILLER WAS ALREADY @ 31 FT.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive 1-foot barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▼ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG — **NUS CORPORATION**

PROJECT: CTO-176 LOCATION: UST-66 DRILLED BY: C. STAMAS BORING NO.: R-1

DATE STARTED: 7/19/94 INCLINATION: Vertical LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/19/94 BEARING: NM CHECKED BY: TOTAL DEPTH: 14'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							0802 N.S. STARTED @ 0810
	2	SS-1	10,12 15,16	24	11"	66-B1-SB 0204 @ 0810		0204 SAND, (SW) MOSTLY M.F.S. WITH TRACE ~~SOME~~ FINE SAND + TRACE C.S. SOME FINE GRAVEL UP TO 3/4" DIAM. SUB-ROUNDED. DARK BROWN.
	4	SS-2	20,26 27,12	24	20"	66-B1-SB 0406 @ 0840		0406 2A-16" SIMILAR TO ABOVE, GRAVEL IS SUB-ANGULAR + FRAGMENTED. 2B-4" SILTY SAND (SM) MOSTLY V.F.S. WITH SOME SILT DARK GREY.
	6	SS-3	120/1"	1"	∅	66-B1-SB 0608 @ 0845		HARD DRILLING, MANY BOULDERS 0608 NO RECOVERY: NO SAMPLES
	8	SS-4	15,16 34,31	24	10"	66-B1-SB 0810 @ 0855		0810 POOR RECOVERY: ~~SAME~~ SIMILAR TO 2B. DARK GREY + BROWN V.F.S + SILT. WET MANY ROUNDED GRAVEL ~1-2" DIAM.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO-178 LOCATION: UST-66 DRILLED BY: C. STAMAS BORING NO.: B-1

DATE STARTED: 7/19/94 INCLINATION: LOGGED BY: T. DORGAN GROUND ELEV.: NM

DATE COMPLETED: 7/19/94 BEARING: CHECKED BY: TOTAL DEPTH: 14'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	10	SS-5	6,7 14,17	24	4"	66-B1-SB 1012 @ 0900		1012 5A - 2" OF SIMILAR TO 2B. & GRAVEL NOT AS LARGE, BUT RECOVERY POOR. DAMP, BUT NOT SATURATED. 5B - 2" ROCK FRAGS SILTY SAND (SM) SOME GRAVEL.
	12	SS-6	12,17 17,20	24	10"	66-B1-SB 1214 @ 0905.		1214 SAND (SW) MOSTLY M.S. WITH TRACE C.S. + SOME GRAVEL. ROCK FRAGS + DUST. NEARLY DRY? GREY TO TAN.

AUGER + ALL FLIGHTS WERE PULLED OUT PRIOR TO SLURRY GOING IN HOLE.

EOH @ 14'

DRILLER DIDN'T SEE NEED TO SLURRY THRU AUGER IN SHALLOW HOLE. DID NOT ASK SUS DID IT.

BACKFILLED WITH SLURRY CHIPS + SAND. 14 → 2' SAND + HOT TOP 1' - SURF.

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer
blows 30" to drive
4 split barrel sampler;
boring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
∇ - Natural ground water table

NOTES:

DATE: PROJECT NO.:
PAGE: OF BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: CTO 178	LOCATION: Davisville RI	DRILLED BY: EDI - S. Lamarche	BORING NO.: 26-MW1
DATE STARTED: 7-19-94	INCLINATION: Vertical	LOGGED BY: K Jalkut	GROUND ELEV.: NM
DATE COMPLETED: 7-19-94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 30'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							ASPHALT ~2 in
	1							
	2							
	3	S-1	4-4 5-5	24	12	26-MW1-SB-0801 1241 hrs - 0ppm		S-1 (12 in) SILTY SAND. Fine sand poorly graded, fine subrounded gravel up to 1/4-1/2 in in length. Dark brown (SM).
	4							
	5	S-2	2-3 4-4	24	9	26-MW1-SB-0400 1245 hrs 0ppm		S-2 (9 in) SILTY SAND tr. gravel. Fine sand poorly graded, fine rounded gravel up to 1/2 in in length, coarse subrounded gravel to subangular gravel up to 1 in in length. Dark brown (SM).
	6							
	7	S-3	4-5 7-6	24	13	26-MW1-SB-0607 1249 hrs 0ppm		S-3A (3 in) SAND tr silt Fine sand poorly graded. Brown to tan. (SP) Loose, Dry
	8							
	9	S-4	14-12 12-10	24	14	26-MW1-SB-0810 1255 hrs 0ppm		S-3B (10 in) SILTY SAND. Fine sand poorly graded. Compact. Dark brown. Broken rock fragments up to 3/4 in in length. (SM)
	10							
	11	S-5	5-8 8-12	24	15	26-MW1-SB-1012 1309 hrs 0ppm		S-4 (14 in) SILTY SAND. Fine sand poorly graded. Compact. Dark brown. Damp. Unidentified red dots in soil (random). (SM).
	12							
	13	S-6	17-12 12-8	24	14	26-MW1-SB 1214 1325 hrs 0ppm		S-5A (5 in) SILTY SAND Fine sand tr. red sand in clumps. Poorly graded. Dark brown (SM)
	14							
	15	S-7	7-9 10-10	24	12	26-MW1-SB 1416 1320 hrs 0ppm		S-5B (10 in) Gravelly sand tr. silt. Fine sand tr. red and coarse sand poorly graded. Coarse subrounded and subangular gravel up to 1 1/2 in in length. Fine subrounded gravel up to 1/2 in in length. Loose. Tan / Brown. (GP).
	16							
	17	S-8	10-9 7-7	24	15	26-MW1-SB 1618 1325 hrs 0ppm		
	18							
	19	S-9	3-3 4-4	24	12	26-MW1-SB 1520 1336 hrs 0ppm		S-6A (5 in) SAND, tr. silt, tr. gravel. Fine sand, tr. red sand, poorly graded; fine subrounded gravel up to 1/8-1/4" in length. Loose. Dry.
	20							

Samples

Samples only

Samples only

Samples only

Samples only

Samples only

Ditto

Ditto

Samples

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
~~See page 1~~
HSA 4 1/4" ID 8" OD
Cont. sampling 2-30'
Jan Headspace Readings
2' increments w/ barrel (2" ID)

DATE: 7-19-94	PROJECT NO.: 1905
PAGE: 1 OF	BORING NO.: 26-MW1

BORING LOG

NUS CORPORATION

PROJECT: CTO 177 LOCATION: Davisville RI DRILLED BY: FDI - S. Lamarche BORING NO.: 26-MW-01

DATE STARTED: 7-19-94 INCLINATION: Vertical LOGGED BY: K Jalkut GROUND ELEV.: NM

DATE COMPLETED: 7-19-94 BEARING: NM CHECKED BY: TOTAL DEPTH: 30'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	20							
	21	S-10	6-7 6-6	24	3	26-MW1-SB-2022 1342 hrs. 1.5 ppm		
	22							
	23	S-11	7-9 12-10	24	16	26-MW1-SB 2224 1349 hrs. 0.5 ppm		
	24							
	25	S-12	7-8 7-9	24	22	26-MW1-SB 2426 1400 0.2 ppm		
	26							
	27	S-13	7-8 8-8	24	24	26-MW1-SB 2628 1410 hrs. 1.5 ppm		
	28							
	29	S-14	7-8 10-10	24	24	26-MW1-SB 2830 1918 hrs. 0 ppm		
	30							

Pour recovery 20' Drillers sat.

D.S

DJ

DJ

S-6B (9 in) SAND. Fine sand poorly graded. Brown. Dry. (SP)

Note - 3 in interval of broken metamorphic rock fragments between S-6A and S-6B.

S-7 (12 in) Gravelly Sand. Fine to med Sand; poorly graded; fine/coarse subrounded gravels 1/2 - 1 1/2 in length, respectively. Loose, Dry. Grey-brown to tan. (GP)

S-8A (10 in) SAND ~~tr silt~~ Fine to med tr coarse sand Sand poorly graded. Layered. Salt and Pepper coloration. (SP) Grey brown.

S-8B (5 in) SAND. Fine sand poorly graded. Stratified. Light brown. (SP).

S-9A (5 in) SAND Fine sand similar to S-8B. (SP)

S-9B (7 in) SAND Fine/med Sand w/ some red mottling 1/2 in bands. Poorly graded. (SP).

S-10 (3 in) SILTY SAND Fine sand poorly graded. Dark brown. Saturated (SM)

S-11 (16 in) SAND Fine sand poorly graded. Mottled red-brown in areas. Wet. Brown-Tan (SP)

S-12 (22 in) ~~SILTY~~ SAND some silt. Fine sand poorly graded. ~~Interbeds~~ of lighter fine sand w/ few silt. Grey brown w/ brown tan interbeds. (SM)

S-13 (24 in) SILTY SAND. Fine sand poorly graded. Dark brown (SM)

S-14A (11 in) SAND some silt fine sand poorly graded. Brown (SM)

S-14B (13 in) SILT tr sand Fine sand poorly graded. Black. (ML)

EOB at 30'. Augers to 30'. Set well. 29-19'. Sand cushion 30-29.

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; spring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water table

NOTES: See page 1

DATE: 7-19-94 PROJECT NO.: 1905

PAGE: 2 OF BORING NO.: 26-MW-01

BORING LOG

MISCELLANEOUS:

PROJECT: CTC 178	LOCATION: Davisville RI	DRILLED BY: ED I - L. Lamarche	BORING NO.: 26-MW2
DATE STARTED: 7-20-94	INCLINATION: Vertical	LOGGED BY: K Jackut	GROUND ELEV.: NM
DATE COMPLETED: 7-20-94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 30'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in	REC. in	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							ASPHALT NO SAMPLES 0-2'
	1							
	2							S-1A (4in.) SILTY SAND tr gravel. Fine sand poorly graded; fine subangular gravels; rock frags; piece of asphalt (on pec). Brown. (SM)
	3	S-1	4-5 4-3	24	21	26-MW2-SB-0204 1004 hrs 0ppm		S-1B (17in) SILTY SAND. Fine sand. Poorly graded. Brown. (SM)
	4							
	5	S-2	4-5 7-7	24	22	26-MW2-SB-0406 1011 hrs 0ppm		S-2A (12in) SILTY SAND. Fine sand poorly graded Brown (SM)
	6							
	7	S-3	89-100/4in	24	10	26-MW2-SB 0608 1016 hrs 0ppm		S-2B (10in) SAND tr silt. Fine sand poorly graded Loose Dry. Light brown. (SP)
	8							
	9	S-4	4-5 6-6	24	12	26-MW2-SB-0810 0ppm Augers grinding out wet ~8-8' 1025 perched ? H2O		S-3 (10in) SILTY SAND. Fine sand poorly graded Brown. (SM) Rock in base of barrel - increased count.
	10							S-4 (12in) SILTY SAND, Fine sand poorly graded. Brown. Damp. Perched H2O? Red spots (SM)
	11	S-5	4-4 3-3	24	18	26-MW2-SB-1012 1038 hrs 0ppm		S-5 (18in) SILTY SAND - similar to S-4 - Damp. (SM)
	12							
	13	S-6	7-8 7-9	24	10	26-MW2-SB-1214 1040 hrs. 0ppm		S-6 (10in) SAND tr silt tr gravel. Fine sand poorly graded; fine subrounded gravel up to 1/4 in in length; rock fragments. Salt/Pepper coloration. Grey-brown (SP) Gravelly.
	14							
	15	S-7	7-17 20-20	24	17	26-MW2-SB-1416 1056 hrs 0ppm		S-7 (17in) SAND tr silt, ~~some gravel~~. Fine sand poorly graded, coarse subangular and subrounded gravel up to 2 inches in length. Salt/Pepper coloration; rock fragments. (SP)
	16							
	17	S-8	17-21 25-30	24	7	26-MW2-18-1618 1102 hrs 0ppm		S-8 (7in) Gravelly sand tr. silt. Fine sand poorly graded; fine subrounded gravel up to 1/4 in in length rock fragments; (slate black ?). Reddish brown (SP)
	18							
	19	S-9	7-7 18-9	24	15	26-MW2-SB-1820 1116 hrs 0ppm		
	20							

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES: HSA 4¼" ID augers 8" OD to 30'
(cont soil sampling
Jar Headspace Readings
2' increments w/ barrel (2in)
O2 meter Button = Shot

LEL/METH - O2 survey reading 5%/20.2

DATE: 7-20-94 PROJECT NO.: 1905
PAGE: 1 OF 2 BORING NO.: 26-MW2

BORING LOG

PROJECT: CTO 178	LOCATION: Danville RT	DRILLED BY: EDI - S. Comanche	BORING NO.: 26-MW2
DATE STARTED: 7-20-94	INCLINATION: Vertical	LOGGED BY: K. Jaikut	GROUND ELEV.: NM
DATE COMPLETED: 7-20-94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 30'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
20								
21		S-10	2-2 3-5	24	14	26-MW2-SB-2022 0ppm 1126hrs ≈ at 20'		S-9A (4in) SAND. Fine sand poorly graded Light brown. (SP). 1 piece, subrounded gravel up to 1/2" fine. Loose, Dry
22								
23		S-11	3-3 3-4	24	20	26-MW2-SB-2224 1128 hrs 0ppm		S-9B (2in) SILTY SAND Fine sand poorly graded. Dark brown. Dense. (SM)
24								S-9C (9in) SAND tr. Silt. Fine sand poorly graded. Stratified at base of spoon - red layers. Damp at base of spoon (SP)
25		S-12	9-11 12-14	24	22	26-MW2-SB-2426 35 1150 hrs 0ppm		
26								S-10A (13in) SAND Fine sand poorly graded saturated. Grey brown (SP)
27		S-13	8-8 9-11	24	24	26-MW2-SB-2628 1145 hrs 0.5 ppm		S-10B (1in) SAND F-C sand well graded. Stained red. (SW)
28								
29		S-14	9-10 11-14	24	24	26-MW2-SB-2830 1155 hrs 0.5 ppm		S-11A (9in) SAND - Similar to S-10A (SP)
30								S-11B (1in) SAND - Similar to S-10B (SW)

S-14B (14in) SILTY SAND. Very Fine sand poorly graded. Dark brown (SM).

EOB at 30'
Augers to 30'
Set well 30-20'

S-11C (10in) SAND tr silt. Fine sand poorly graded. Light brown/reddish tinge. (SP)

S-12 (22in) SAND Fine sand; poorly graded (7) in Brown (SP) → Grey Brown (9in) → Red/brown (6in)

S-13A (15in) SILTY SAND Fine sand poorly graded. Saturated. Dark brown (SM)

S-13B (9in) SAND tr silt. Fine sand poorly graded. Red-brown (SP)

S-14A (10in) ~~SAND tr silt~~ SILTY SAND Fine sand poorly graded. Brown. (SP).

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN. - Penetration length of sampler
REC. - Length of sample recovered
▽ - Natural ground water level

NOTES:
See page 1

DATE: 7-19-94 PROJECT NO.: 205
PAGE: 2 OF 2 BORING NO.: 26-MW2

BORING LOG

PROJECT: CTO 178	LOCATION: Davisville RI	DRILLED BY: EXI - S. Lamanche	BORING NO.: 26-MW3
DATE STARTED: 7-20-94	INCLINATION: Vertical	LOGGED BY: K. Jalkut	GROUND ELEV.: NM
DATE COMPLETED:	BEARING:	CHECKED BY:	TOTAL DEPTH: 31'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							ASPHALT NO SAMPLES 0-2'
	1							
	2							
	3	S-1	6-7 10-20	24	21	26-MW3-SB-0204 0ppm 1507 hrs		S-1 (21in) SILTY SAND. Some gravel. Fine sand poorly graded; fine subrounded gravel up to 1/4" in length; coarse subangular and subroun gravel up to 1/4 in in length; rock fragments (one metamorphic). Brown. (SM) Altered metamorphic pebble/gravel in nose of spoo
	4							
	5	S-2	13-13 15-18	24	24	26-MW3-SB-0406 2ppm 1515 hrs		S-2A (12in) SILTY SAND tr. gravel. Fine sand poorly graded; fine subrounded gravel up to 1/8-1/4" in length; 1 piece coarse subangular gravel up to 3/4" in length. Brown. (S
	6							
	7	S-3	15-20 34-32	24	17	26-MW3-SB-0608 1518 hrs 0ppm		S-2B (12in) Gravelly silty sand. Fine sand poorly graded; fine subrounded gravel up to 1/4 in length; coarse subrounded and subangu gravel/pebbles up to 1in in length; rock fragments. Loose. Dry. Some metamorphic (schist?) fragments. Brown. (GM)
	8							
	9	S-4	17-18 17-17	24	20	26-MW3-SB-0810 1529 hrs 0ppm		
	10							
	11	S-5	11-14 16-12	24	16	26-MW3-SB-1012 1535 hrs 0.5 ppm		S-3 (17in) Gravelly silty sand. Fine sand poorly graded; fine subrounded gravel up to in in length; coarse subrounded gravel up 3/4 in in length; rock fragments up to 2in in diameter, quartz pebble fragment. Bro (GM)
	12							
	13	S-6	10-13 15-20	24	17	26-MW3-SB-1214 1538 hrs 0ppm		
	14							S-4 (20in) Gravelly silty sand - similar to S-3. Brown (GM) (coarse - 1 1/4" Fine - 1/2") subrounded - trace medica met. rock frags
	15	S-7	10-12 20-15	24	11	26-MW3-SB-1416 1547 0ppm		
	16							S-5A (13in) Gravelly silty sand - similar to S-4 (GM)
	17	S-8	12-8 8-8	24	16 ~~17~~ 21	26-MW3-SB-1618 1550 hrs 0ppm		S-5B (3in) SILTY SAND Fine sand poorly g Dark brown (SM) Iron "dots" - random
	18							S-6A (4in) SILTY SAND. Fine sand. Poorly gra similar to S-5B - Dense - no iron dots (SM
	19	S-9	4-4 5-5	24	18 ≥20"	26-MW3-SB-1920 1558 hrs. 0ppm		S-6B (8in) SAND tr. silt. Fine sand. Sand/P Brown to Red Colination - mottled. Loose. Dry (SP
	20							

Drilled Jar RB-Sample 1a

Sample

DJ

Sample 1a

S-6C (6in) Gravelly silty sand. F/m sand poorly graded; fine subrounded grav up to 3/8" in length; coarse subrounded up to 1 1/4 in, ro fragments up to 1 1/2 in diameter. Bro

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Ⅴ - Natural ground water table

NOTES:
HSA 4 1/4" ID 8" OD
Cont. sampling 2'-30'
Jar Headspace Readings
2' increments w/ barrel (2" ID)

DATE: 7-20-94	PROJECT NO.		
PAGE: 1 OF	BORING NO.		

BORING LOG — **NUS CORPORATION**

PROJECT: CTO 178	LOCATION: Davisville RI	DRILLED BY: EDI S. Lamarche	BORING NO.: 26-MW3
DATE STARTED: 7-20-94	INCLINATION: Vertical	LOGGED BY: K. Jackout	GROUND ELEV.: NM
DATE COMPLETED:	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 31'

	ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	20								
DJ	21		S-7	4-8 / 8-8	24	11	26-MW3-SB-2022 1605hrs 0ppm		S-7 (11in) Gravelly silty Sand Fine sand tr. med sand poorly graded; fine subrounded gravel up to ½ in in length/diameter; coarse subrounded gravel up to 1in in length – ½" in diameter; rock fragments up to 2" diameter; crushed quartz pebble; dry; loose. Salt/Pepper coloration Red/Brown (GM)
DJ	22								
	23		S-11	8-5 / 5-6	24	24	26-MW3-SB-2224 1608hrs 0ppm		
7-20 / 7-21	24								
DJ	25		S-12	3-3 / 4-5	24	17	26-MW3-SB-2426 0733hrs 0ppm		S-8A (10in) Gravelly Silty sand - similar to S-7. (GM)
	26								
DJ	27		S-13	4-5 / 7-9	24	17	26-MW3-SB 2628 0736 hrs 0ppm		S-8B (9in) SAND, tr silt. Fine sand poorly graded. Stratified. Light brown/tan (SP)
	28								S-8C (2in) SILTY SAND Fine sand poorly graded. Dark brown (SM)
	29		S-14	7-8 / 10-10	24	19	26-MW3-SB 2830 0754 hrs 0ppm		S-9 (18in) SAND tr silt Fine to med sand poorly graded Salt/Pepper coloration Light brown to Brown (SP)
D.	30								

S-12 (17in) SILTY SAND. Fine sand poorly graded. Dark brown to grey brown. (SM)

S-13 (17in) SILTY SAND - similar to S-12. 3in thick layer at base of spoon - oxidized deep orange-red coloration. (SM). Interbedded layer of silt (½in thick).

S-14A (9in) SILTY SAND Fine sand tr. med sand poorly graded. Brown. (SM)

S-14B (10in) SILTY SAND Fine sand poorly graded. Grey. (SM)

S-10 (11in) SAND tr. silt. Fine sand poorly graded. Reddish brown. (SP)

S-11A (7in) SAND tr silt F/m sand poorly graded. Brown. (SP)

S-11B (9in) SAND ~~tr~~ some silt Fine sand poorly graded Brown (~~SP~~ SM)

S-11C (8in) SILTY SAND Fine sand poorly graded. Dark brown to grey brown (SM)

EOB at 30'. Augers to 31'. Sand cushion 31-30'. Set well 30 to 29'. See well log

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
▽ - Natural ground water level

NOTES: See page 1

Drilling initiated 7-21: 0720 hrs.

DATE: 7 PROJECT NO.: 1905
PAGE: 2 OF 2 BORING NO.: 26-MW3

BORING LOG

NUS CORPORATION

PROJECT: CTO 178 Investigation LOCATION: Davisville RI DRILLED BY: ED 1 - S. Lamanche BORING NO.: 26-B1

DATE STARTED: 7-19-94 INCLINATION: Vertical LOGGED BY: K Salkut GROUND ELEV.: NM

DATE COMPLETED: 7-19-94 BEARING: NM CHECKED BY: TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
0								ASPHALT NO SAMPLE 0-2'
1								
2								
3		S-1	6-7 12-15	24	19	26-B1-SB-0304 1044 hrs. 0ppm		S-1A (12in) SILTY SAND. Fine sand, poorly graded Brown to Dark brown.
4								S-1B (7in) SAND, some silt, tr. gravel. Fine sand, tr. med sand, poorly graded; fine subrounded gravel up to 1/2in in length. Dry - Loose. Light brown. (SM)
5		S-2	7-9 8 48-32	24	21	26-B1-SB-0406 1058 hrs 0ppm		1 piece coarse subrounded gravel up to 1 1/1 in.
6								S-2A (10in) SILTY SAND, some gravel. Fine sand, tr. med sand, poorly graded; fine subrounded gravel up to 1/4 in in length; coarse subangular gravel up to 1 1/2 in coarse subrounded gravel up to 1in. Dark brown. (SM)
7		S-3	27 24 19-16	24	15	26-B1-SB-0606 1100 hrs 0ppm		
8								
9		S-4	9-11 16-63 8	24	14	26-B1-SB-0810 1110 hrs 0ppm		S-2B (11in) Broken metamorphic rock fragments appears to be a quartz mica schist. Possibly concrete pieces as well. Grey; loose, dry. (No Designation)
10								
11		S-5	8-12 11-17	24	11	26-B1-SB-1012 1120 hrs ~~0ppm~~		S-3A (5in) Gravelly silty sand. Fine sand tr. med sand poorly graded; fine subangular gravels up to 1/2in in length. coarse (1 piece) subrounded gravel up to 1 1/2in in length. Dry, Loose. Brown (GM).
12						~~26-B1-SB-1214~~		
13		S-6						
14								S-3B (10in) SAND tr. silt. Fine sand tr med sand poorly graded; stratified ≡. Brown. (SP)
15		S-7						
16						void		S-4 (14in) SILT, tr. sand. Fine sand poorly graded. Dark brown to black. Damp only. (ML)
17		S-8				Note: No Hed Table viewed.		
18								S-5 (11in) SAND tr. silt. Fine sand, poorly graded. metamorphic chips - appear to be slate (black). Brown. Loose. Dry. (SP)
19		S-9				coarse metamorphic rock frag. up to 1 1/2 in.		EOB @ 12' Backfill w/ bent. slurry + sand to surface. Patch asphalt
20								

LEGEND:
TYPE-NO. - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
▽ - Natural ground water table

NOTES:
HSA 4 1/4" ID augers 8" OD
Continuous soil sampling 2-12'
Jar Headspace Technique
2' increments with split barrel
2" ID barrel

CUA412330
Drilling starts: 1040 hrs

0945 hrs. drillers back from fixing tire
0930 K Orwell onsite

DATE: 7-19-94 PROJECT NO.: 905
PAGE: 1 OF ___ BORING NO.:

BORING LOG

NUS CORPORATION

PROJECT: C70 178 | LOCATION: Davisville RI | DRILLED BY: EDI S. Lamarche | BORING NO.: 26-B2

DATE STARTED: 7-20-94 | INCLINATION: vertical | LOGGED BY: K. Jackert | GROUND ELEV.: NM

DATE COMPLETED: 7-20-94 | BEARING: NM | CHECKED BY: | TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.		BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0								ASPHALT 100 SAMPLES 0-21
	1								
	2								
Drilled for only	3	S-1	X	11-15 25-28	24	17	26-B2-SB-0204 0826 hrs 0ppm		S-1A (8 in) Gravelly silty sand. Fine sand poorly graded; coarse subangular rock fragments and gravel up to 1½ in in length. Dark brown. (GM). Compact.
	4								
Ditto	5	S-2	X	10-11 16-20	24	15	26-B2-SB-0406 0830 hrs 0ppm		S-1B (9 in) Gravelly silty sand. Fine to med. to coarse sand poorly graded; 1½" coarse subangular gravel; rock fragments fine subrounded and subangular gravel up to 1/8-1/4 in in length - Loose. Dry. Grey-brown (GM)
	6								
sample →	7	S-3	X	10-10 11-16	24	18	26-B2-SB 0608 0837 hrs 0ppm		
	8								
← No	9	S-4	X	8-6 6-9	24	18	26-B2-SB 0810 0844 hrs 0ppm		S-2A (6 in) SAND Fine sand Loose Dry Reddish brown Poorly graded (SP)
	10								S-2B (9 in) SILT tr. sand. Fine sand. Poorly graded. Dark brown. Compact or dense. (ML)
Drilled for poor recovery	11	S-5	X	10-11 16-16	24	8	26-B2-SB 1012 0852 hrs 0ppm		S-3A (1 in) SILT tr. sand - similar to S-2B Random red dots - iron concretion? Stain? Granule? (ML) 1 ea subangular rock fragment - coarse
	12								
	13								
	14								S-3B (4 in) SAND Fine sand, poorly graded Grey-brown (light). (SP)
	15								
	16								S-4A (5 in) SILTY SAND Fine sand tr med sand poorly graded. Loose. Dry. Brown. (SM)
	17	S-5A (3 in) SILTY SAND - similar to S-4C (SM)							S-4B (2 in) SILT. ~~tr sand~~ ~~fine sand~~ poorly graded. Dark brown. Denser than 4-A. (ML)
	18								
	19	S-5B (1.5 in) SILT - similar to S-4B							S-4C (11 in) SILTY SAND Fine sand. Poorly graded. Brown. Med Dense. (SM)
	20	S-5C (3.5 in) Gravelly silty sand Fine to med sand poorly graded; fine coarse subangular gravel - 1½"							subangular gravel up to 1/4 in in length - Loose. Dry Grey-brown

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; coring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Z - Natural ground water table

NOTES:
HSA 4¼ ID augers 8" OD
Cont. Sampling 2-
Jar Headspace Readings
2' increments w/ 2 ID split barrel
Drilling initiated - 0810 hrs.
Boring backfilled w/ slurry + sand
No tyvek
Humid, Hot 80's 90% humidity

DATE: | PROJECT NO.: 1905
PAGE: 1 OF 1 | BORING NO.: 26-B2

BORING LOG — **NUS CORPORATION**

PROJECT: CTO 178	LOCATION: Davisville RI	DRILLED BY: EDI - S. Lamanche	BORING NO.: 38-B1
DATE STARTED: 7-21-94	INCLINATION: Vertical	LOGGED BY: K Jalkut	GROUND ELEV.: NM
DATE COMPLETED: 7-21-94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							Rebar piece
	1							
	2							
DJ	3	S-1	59-39 43-59%	24	12	38-B1-SB-0204 0ppm 1134 hrs		S-1 A (5 in) Gravelly silty sand. Fine sand poorly graded; fine gravel up to 1/4" in length/diameter. Subrounded. Brown. (GM).
	4							Interval of concrete chips, dust, nails (5 in) coarse subrounded/angular gravel up to 2"
DJ	5	S-2	10-8 4-6	24	17	38-B1-SB-0406 0ppm 1152 hrs		S-1B (2 in) Silty sand Fine sand poorly graded Grey Dark brown. (SM)
	6							S-2A (4 in) Similar to S-1A.
sample	7	S-3	4-3 3-7	24	11	38-B1-SB-0608 0ppm 1173 hrs		~~S-2B~~ Interval of coarse rock frags, concrete (6 in) chips, dust - Grey. Frag is piece of concrete.
DJ	8							S-2B (5 in) Silty sand - similar to S-1B w/ 1 brick piece. Dark brown (SM)
	9	S-4	7-9 10-11	24	11	38-B1-SB-0810 0ppm 1200 hrs		Altered rock piece in nose
	10							
sample	11	S-5	12-10 10-14	24	11	38-B1-SB-1012 1207 hrs		S-3 (11 in) Gravelly silty sand. Fine to med sand poorly graded; fine subangular gravel up to 1/4 in; coarse subrounded gravel up to 1 1/2 in in length; concrete; rock fragments up to 2 in diameter Grey-brown (GM)
	12							
	13		EOB @ 12'					
	14							S-4 A (7 in) Concrete chip and dust Fine gravel up to 1/2 in in length subrounded to subangular
	15							Backfilled w/ bent slurry + sand; blacktop patch
	16							S-4B (4 in) SILTY SAND. Fine sand poorly graded - oxidized granules (red dots). Dark brown. (SM)
	17							
	18							No water table viewed
	19							
	20							S-5 (11 in) Concrete chips/dust Gravelly silty sand - fine subrounded gravels up to 1/4 in, coarse subrounded gravels up to 1 in; rock frags. Loose. Dry Grey to tan grey - Salt and pepper coloration (GM)

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sampler
REC - Length of sample recovered
Ⅴ - Natural ground water level

NOTES:
HSA 4 1/4" ID 8" OD
Cont. soil 2' - 12'
Jar Headspace Readings
2' increments w/ 2" ID barrel
NS Hinkle

Start: 1130 hrs.

DATE: 7-21-94 PROJECT NO.: 1405
PAGE: 1 OF 1 BORING NO.: 38-B1

BORING LOG — **NUS CORPORATION**

PROJECT: CTO 178	LOCATION: Dixiville Rd	DRILLED BY: S Lamarche - EDI	BORING NO.: 38-B2
DATE STARTED: 7-21-94	INCLINATION: Vertical	LOGGED BY: K. Balkut	GROUND ELEV.: NM
DATE COMPLETED: 7-21-94	BEARING: NM	CHECKED BY:	TOTAL DEPTH: 12'

ELEV. feet	DEPTH feet	SAMPLE TYPE-NO.	BLOWS PER 6"	PEN. in.	REC. in.	REMARKS ON ADVANCE OF BORING	GRAPHIC LOG	SOIL AND ROCK DESCRIPTIONS
	0							ASPHALT NO SAMPLES 0-2'
	1							
	2							
DO	3	S-1	3-3 3-4	24	8	38-B2-SB-0304 0ppm 1335 hrs		S-1 (8in) Gravelly silty sand. Fine sand poorly graded; fine subrounded gravel up to 1/4-1/2" in length; coarse subrounded gravel up to 3/4in in length; rock fragments; concrete chips up to 2" length. Brown. (GM)
	4							
DO	5	S-2	3-3 4-3	24	11	38-B2-SB-0406 0ppm 1342 hrs		S-2 (11in) Gravelly silty sand - similar to S-1. Rock fragment — 2" diameter - metamorphic. Brown. No concrete. (GM).
	6							
sample	7	S-3	2-2 2-4	24	15	38-B2-SB-0608 0ppm 1345 hrs		S-3 (15in) Silty sand. Fine sand poorly graded. Brown. (SM) Interbeds 1/4" thick of black silt in interval.
	8							
	9	S-4	3-3 4-7	24	14	38-B2-SB-0810 0ppm 1352 hrs		S-4A (7in) Silty sand tr. gravel. Fine sand poorly graded; fine subrounded gravel up to 1/4" in diameter; coarse subrounded and subangular gravel up to 1 inch in length. Oxidized granules - red dots. Dark brown (SM)
	10							
sample	11	S-5	7-10 7-8	24	15	38-B2-SB-1012 0.5ppm 1354		S-4B (4in) Gravelly silty sand. Fine to med sand poorly graded; fine subrounded gravel up to 1/2 in in length; rock fragments; crushed quartz pebble. Salt + Pepper coloration. Grey-brown (GM).
	12							
	13		EOB @ 12' No water table viewed					
	14							
	15		Backfilled w/ bentonite slurry + sand ~~Black top patch.~~					S-5A (5in) Gravelly silty sand - similar to S-4B w/ more silty sand. Dark brown. (GM) Dense
	16							
	17							S-5B (5in) Gravelly silty sand. F/M sand poorly graded; fine subrounded gravel up to 1/2"; rock fragments 1/2 long. Red brown (GM)
	18							
	19							S-5C (5in) SAND tr silt. Fine sand. Poorly graded. Light brown. Loose + Dry. (SP)
	20							

LEGEND:
TYPE-NO - Type of sample
C - Rock core sample
S - Split barrel sample
BLOWS PER 6" - 140 lb. hammer falling 30" to drive a split barrel sampler; boring time per foot of rock
PEN - Penetration length of sample
REC - Length of sample recovered
Ⅴ - Natural ground water level

NOTES:
HSA 4 1/4" ID 8" OD
Cont. soil sampling 2-12'
2' increments w/ 2" ID barrel
Jan Headspace Readings

DATE: / PROJECT NO.: 1905
PAGE: 1 OF BORING NO.: 38-B2

APPENDIX C

WELL CONSTRUCTION LOGS

UST AREA A1

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: 1905-0220 - UST INVESTIGATION — PAGE: 1 OF 1

PROJECT LOCATION: DAVISVILLE, RI NCBC

CLIENT: U.S. NAVY — BORING NO.: ~~MW-1~~ 3-MW1

CONTRACTOR: ENVIRONMENTAL DRILLING INC. — DRILLER: C. STAMAR — BORING LOCATION: UST-3 AREA A1

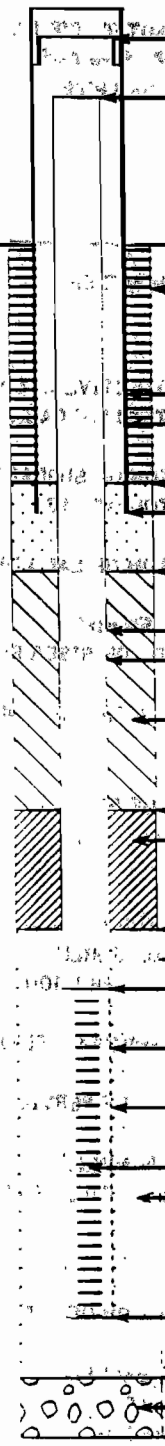
LOGGED BY: T. DORAN — DATE: 7/21/94 — PROJECT NO.: CTO-178

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



General soil conditions (not to scale)

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	ROAD BOX - FLUSH
LENGTH OF RISER PIPE ~~ABOVE~~ below GROUND SURFACE	- 0.36'
TYPE OF SURFACE SEAL	CEMENT
TYPE OF PROTECTIVE CASING	CAST ALUMINUM
I.D. OF PROTECTIVE CASING	6"
DEPTH BOTTOM OF SURFACE SEAL	8"
DEPTH BOTTOM OF CASING	10"
DEPTH BOTTOM OF SAND DRAIN	5'
TYPE OF RISER PIPE	SCHED. 40 PVC
I.D. AND O.D. OF RISER PIPE	2" ID, 2 3/8" OD
TYPE OF BACKFILL AROUND RISER PIPE	#1 SILICA SAND
DEPTH TOP OF SEAL	5'
TYPE OF SEAL	BENTONITE CHIPS
DEPTH BOTTOM OF SEAL	7'
DIAMETER OF BOREHOLE	8"
DEPTH TOP OF PERVIOUS SECTION	9'
TYPE OF PERVIOUS SECTION	SCHED. 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2" ID, 2 3/8" OD
TYPE OF OPENINGS	0.010 SLOTTED
TYPE OF BACKFILL AROUND PERVIOUS SECTION	#1 SILICA SAND
DEPTH BOTTOM OF PERVIOUS SECTION	19'
DEPTH OF BACKFILL	19'
TYPE OF BACKFILL	#1 SILICA SAND
END OF BORING	20'

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: 1905-0220 — PAGE: 1 OF 1

PROJECT LOCATION: DAVISVILLE RI - NCBC

CLIENT: US NAVY — BORING NO.: ~~MW-1~~ 6-MW1

CONTRACTOR: ENVIRONMENTAL DRILLING — DRILLER: C. STAMATS — BORING LOCATION: USI #6 ACCL A1

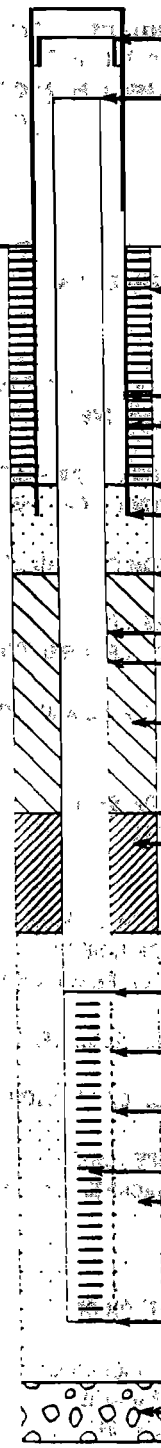
LOGGED BY: T. DORGAN — DATE: 7/2/94 — PROJECT NO.: CTO-178, 1105

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



General soil conditions (not to scale)

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	FLUSH TO GS
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	-0.38
TYPE OF SURFACE SEAL	CEMENT
TYPE OF PROTECTIVE CASING	CAST. ALUM
I.D. OF PROTECTIVE CASING	7"
DEPTH BOTTOM OF SURFACE SEAL	8"
DEPTH BOTTOM OF CASING	10"
DEPTH BOTTOM OF SAND DRAIN	3 FT
TYPE OF RISER PIPE	SCHED. 40 PVC
I.D. AND O.D. OF RISER PIPE	2" ID 2 3/8" OD
TYPE OF BACKFILL AROUND RISER PIPE	BENT. + SAND
DEPTH TOP OF SEAL	5
TYPE OF SEAL	BENT. CHIPS
DEPTH BOTTOM OF SEAL	7
DIAMETER OF BOREHOLE	
DEPTH TOP OF PERVIOUS SECTION	9'
TYPE OF PERVIOUS SECTION	
I.D AND O.D. OF PERVIOUS SECTION	
TYPE OF OPENINGS	
TYPE OF BACKFILL AROUND PERVIOUS SECTION	
DEPTH BOTTOM OF PERVIOUS SECTION	19'
DEPTH OF BACKFILL	19'
TYPE OF BACKFILL	#1 SILICA SAND
END OF BORING	20'

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: [illegible] PAGE: 1 OF 1

PROJECT LOCATION: MANSVILLE RI NCBC

CLIENT: NAVY BORING NO.: ~~MW-1~~ 11-MW1

CONTRACTOR: LDI DRILLER: [illegible] BORING LOCATION: [illegible] Area A1

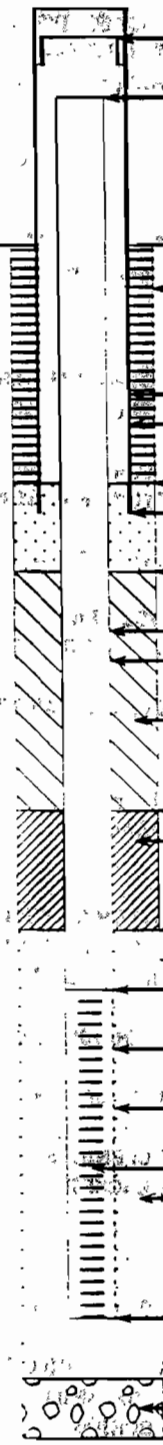
LOGGED BY: T. Dorgan DATE: [illegible] PROJECT NO.: TC178 1905

CHECKED BY: DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



General soil conditions (not to scale)

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	~~30~~ Flush
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	~0.39 FT
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Cast Aluminum
I.D. OF PROTECTIVE CASING	7 in
DEPTH BOTTOM OF SURFACE SEAL	10 in 16"
DEPTH BOTTOM OF CASING	1 FT ~~30'~~
DEPTH BOTTOM OF SAND DRAIN	5'
TYPE OF RISER PIPE	SCHED. 40 PVC
I.D. AND O.D. OF RISER PIPE	[illegible]
TYPE OF BACKFILL AROUND RISER PIPE	SAND [illegible]
DEPTH TOP OF SEAL	[illegible]
TYPE OF SEAL	[illegible]
DEPTH BOTTOM OF SEAL	[illegible]
DIAMETER OF BOREHOLE	[illegible]
DEPTH TOP OF PERVIOUS SECTION	[illegible]
TYPE OF PERVIOUS SECTION	[illegible]
I.D AND O.D. OF PERVIOUS SECTION	[illegible]
TYPE OF OPENINGS	[illegible]
TYPE OF BACKFILL AROUND PERVIOUS SECTION	[illegible] SAND
DEPTH BOTTOM OF PERVIOUS SECTION	19'
DEPTH OF BACKFILL	[illegible]
TYPE OF BACKFILL	[illegible] SAND
END OF BORING	[illegible]

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: KOS-C220 UST. INVEST. — PAGE: 1 OF 1

PROJECT LOCATION: JAMISVILLE RT. NCBC.

CLIENT: U.S. NAVY — BORING NO.: ~~MW-2~~ 11-MW2

CONTRACTOR: ENVIRONMENTAL DRILLING INC — DRILLER: G. STAMAS — BORING LOCATION: UST. 11-22 Area A1

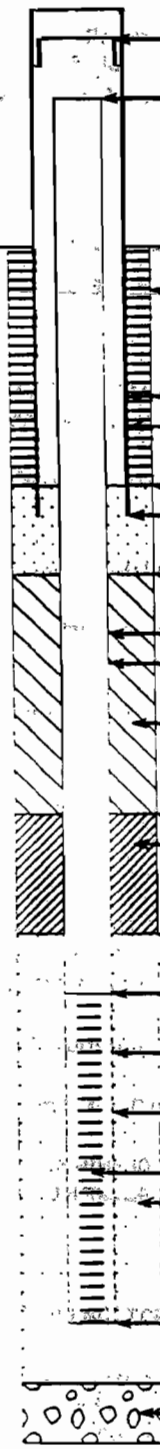
LOGGED BY: T. DURGAN — DATE: 7/13/94 — PROJECT NO.: CTO-178, 1905

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



General soil conditions (not to scale)

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	~~30" STICK-UP~~ Flush
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	0.41
TYPE OF SURFACE SEAL	CEMENT
TYPE OF PROTECTIVE CASING	STEEL STICK-UP
I.D. OF PROTECTIVE CASING	
DEPTH BOTTOM OF SURFACE SEAL	20"
DEPTH BOTTOM OF CASING	30"
DEPTH BOTTOM OF SAND DRAIN	5'
TYPE OF RISER PIPE	SCHED 40 PVC
I.D. AND O.D. OF RISER PIPE	2"ID 2 3/8" OD
TYPE OF BACKFILL AROUND RISER PIPE	BENT. + SAND
DEPTH TOP OF SEAL	5'
TYPE OF SEAL	BENTONITE
DEPTH BOTTOM OF SEAL	7"
DIAMETER OF BOREHOLE	8"
DEPTH TOP OF PERVIOUS SECTION	9'
TYPE OF PERVIOUS SECTION	SCHED 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2"ID 2 3/8" OD
TYPE OF OPENINGS	0.010 SLOTTED
TYPE OF BACKFILL AROUND PERVIOUS SECTION	#1 SILICA SAND
DEPTH BOTTOM OF PERVIOUS SECTION	19'
DEPTH OF BACKFILL TOP	19'
TYPE OF BACKFILL	#1 SILICA SAND
END OF BORING	20'

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: 1905-0220 UST INVESTIGATION — PAGE: 1 OF 1

PROJECT LOCATION: DAVISVILLE RI NCBC

CLIENT: US NAVY — BORING NO.: ~~MW~~ 3 11-MW3

CONTRACTOR: ENVIRONMENTAL DRILLING INC. — DRILLER: C. SAMMAS — BORING LOCATION: UST-11-22, Area A1

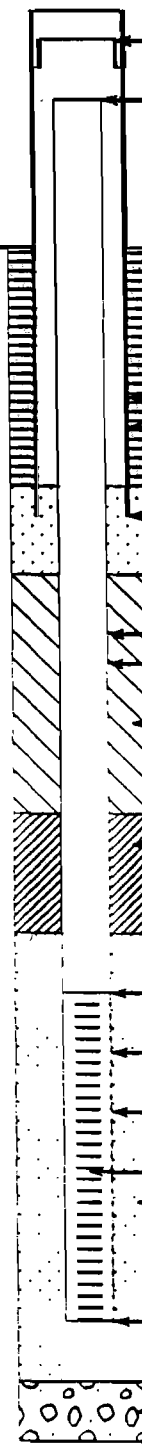
LOGGED BY: T. DORGAN — DATE: 7/14/94 — PROJECT NO.: CTO-178, 1905

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



General soil conditions (not to scale)

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	~~30"~~ ~~0.3~~ Flush
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	~~18"~~ 0.34
TYPE OF SURFACE SEAL	CEMENT
TYPE OF PROTECTIVE CASING	STEEL RISER
I.D. OF PROTECTIVE CASING	4.25"
DEPTH BOTTOM OF SURFACE SEAL	16"
DEPTH BOTTOM OF CASING	30"
DEPTH BOTTOM OF SAND DRAIN	5'
TYPE OF RISER PIPE	SCHED. 40 PVC
I.D. AND O.D. OF RISER PIPE	2" ID 2 3/8" OD
TYPE OF BACKFILL AROUND RISER PIPE	SILICA SAND
DEPTH TOP OF SEAL	5'
TYPE OF SEAL	BENTONITE CHIP
DEPTH BOTTOM OF SEAL	7'
DIAMETER OF BOREHOLE	8"
DEPTH TOP OF PERVIOUS SECTION	9'
TYPE OF PERVIOUS SECTION	SCHED 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2" ID 2 3/8" OD
TYPE OF OPENINGS	0.010 SLOTTED
TYPE OF BACKFILL AROUND PERVIOUS SECTION	#1 SILICA SAND
DEPTH BOTTOM OF PERVIOUS SECTION	19'
DEPTH OF BACKFILL	19'
TYPE OF BACKFILL	#1 SILICA SAND
END OF BORING	20'

UST AREA B

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: 1905-0220 — PAGE: 1 OF 1

PROJECT LOCATION: DAVISVILLE RI NCBC

CLIENT: U.S. NAVY — BORING NO.: ~~MW~~ 56-MW11

CONTRACTOR: ENVIRONMENTAL DRILLING INC — DRILLER: C STAMAR — BORING LOCATION: TANK 56, Area B

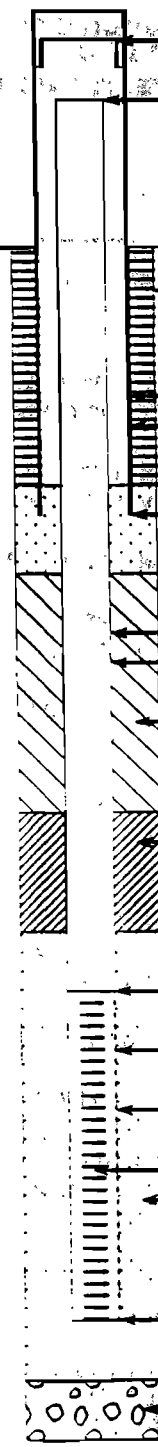
LOGGED BY: T DORGAN — DATE: 7/11/94 — PROJECT NO.: CTO-178, 1905

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: ROADBOX - FLUSH

ELEVATION TOP OF RISER PIPE:

GROUND ELEVATION: NM



General soil conditions (not to scale)

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	FLUSH TO GROUND
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	-0.13
TYPE OF SURFACE SEAL	CEMENT
TYPE OF PROTECTIVE CASING	CAST ALUM.
I.D. OF PROTECTIVE CASING	7 INCH
DEPTH BOTTOM OF SURFACE SEAL	8"
DEPTH BOTTOM OF CASING	10'
DEPTH BOTTOM OF SAND DRAIN	2 FT
TYPE OF RISER PIPE	SCHEDULE 40 PVC
I.D. AND O.D. OF RISER PIPE	2.0" ID 2 3/8" OD
TYPE OF BACKFILL AROUND RISER PIPE	BENT. CHIPS & #1 SILICA SAND
DEPTH TOP OF SEAL	4 FT
TYPE OF SEAL	BENT. CHIPS
DEPTH BOTTOM OF SEAL	6 FT.
DIAMETER OF BOREHOLE	8 INCH
DEPTH TOP OF PERVIOUS SECTION	9 FT.
TYPE OF PERVIOUS SECTION	SCHEDULE 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2.0" ID - 2 3/8" OD
TYPE OF OPENINGS	0.010 SLOTTED
TYPE OF BACKFILL AROUND PERVIOUS SECTION	#1 MORIE SILICA S
DEPTH BOTTOM OF PERVIOUS SECTION	19'
DEPTH OF BACKFILL	19.5
TYPE OF BACKFILL	#1 MORIE SILICA S
END OF BORING	20 FT

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: 1905-0220 — PAGE: 1 OF 1

PROJECT LOCATION: DAVISVILLE RI N.C.B.C.

CLIENT: US NAVY — BORING NO.: ~~MW~~ 58-MW01

CONTRACTOR: ENVIRONMENTAL DRILLING — DRILLER: C. STAMAS — BORING LOCATION: TANK 58 Area B

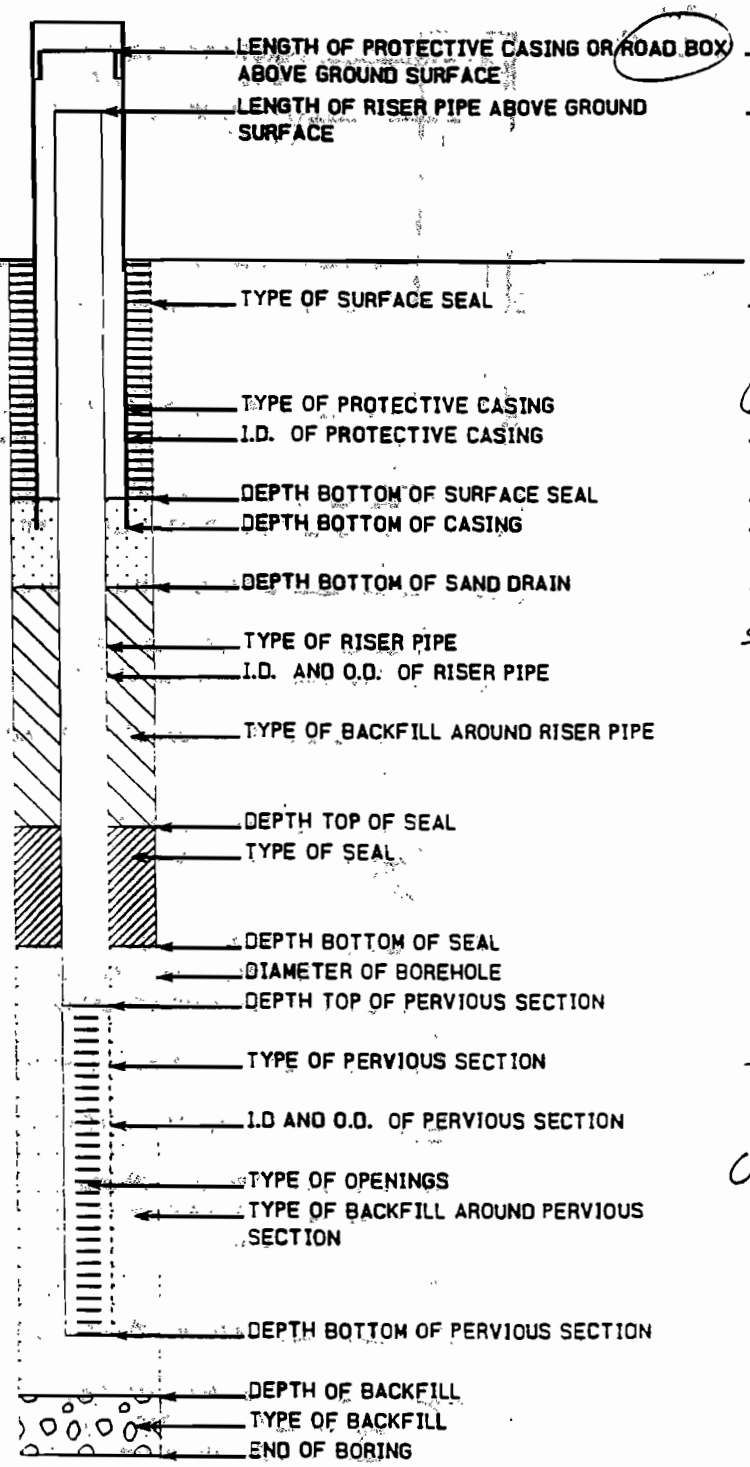
LOGGED BY: T. DORGAN — DATE: 2/11/94 — PROJECT NO.: CTO-178, 1905

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING

ELEVATION TOP OF RISER PIPE

GROUND ELEVATION



General soil conditions (not to scale)

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	FLUSH TO GROUND
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	-0.21
TYPE OF SURFACE SEAL	CEMENT
TYPE OF PROTECTIVE CASING	CAST ALUMINUM
I.D. OF PROTECTIVE CASING	7 INCH
DEPTH BOTTOM OF SURFACE SEAL	6"
DEPTH BOTTOM OF CASING	10"
DEPTH BOTTOM OF SAND DRAIN	2 FT
TYPE OF RISER PIPE	SCHED. 40 PVC
I.D. AND O.D. OF RISER PIPE	2" ID 2 3/8" OD
TYPE OF BACKFILL AROUND RISER PIPE	BENT. + SAND
DEPTH TOP OF SEAL	4'
TYPE OF SEAL	BENT.
DEPTH BOTTOM OF SEAL	6'
DIAMETER OF BOREHOLE	8 INCH
DEPTH TOP OF PERVIOUS SECTION	9.5 FT
TYPE OF PERVIOUS SECTION	SCHED. 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2" ID 2 3/8" OD
TYPE OF OPENINGS	0.010 SLOTTED
TYPE OF BACKFILL AROUND PERVIOUS SECTION	#1 MORIE SILICA
DEPTH BOTTOM OF PERVIOUS SECTION	19.50
DEPTH OF BACKFILL	19.5
TYPE OF BACKFILL	#1 MORIE SILICA SAND
END OF BORING	70 FT

UST AREA D1

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: CTO 178 NCBC Davisville UST Investigation — PAGE: 1 OF 1

PROJECT LOCATION: Davisville

CLIENT: US Navy — BORING NO.: ~~MW1~~ 46-MW1

CONTRACTOR: Environmental Drilling — DRILLER: S Lanarch — BORING LOCATION: UST 46 Area D1

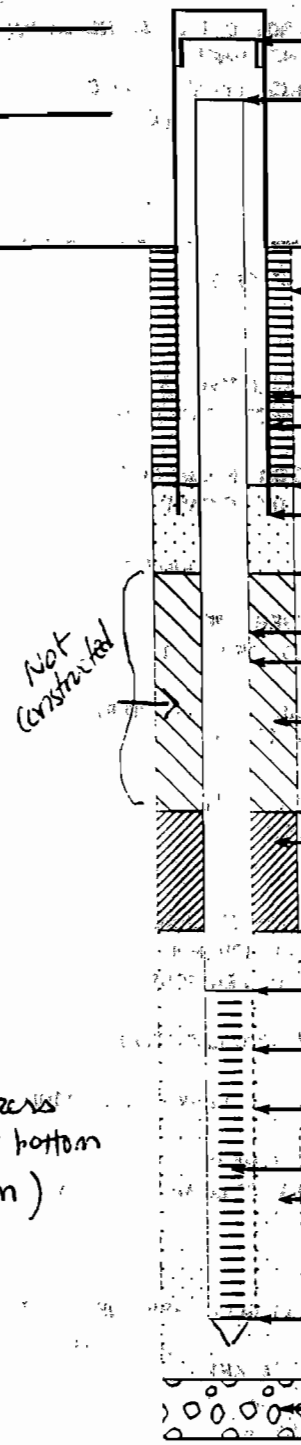
LOGGED BY: K Walkut — DATE: 7-6-94 — PROJECT NO.: 1905, CTO 178

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



General soil conditions (not to scale).

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	Flush to ground
LENGTH OF RISER PIPE ~~ABOVE~~ BELOW GROUND SURFACE	~~4 1/4"~~ (-) 0.35 FT
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Cast Aluminum ~~Steel~~
I.D. OF PROTECTIVE CASING	7in
DEPTH BOTTOM OF SURFACE SEAL	~~1.0 FT~~ 10in
DEPTH BOTTOM OF CASING	1.0 FT
DEPTH BOTTOM OF SAND DRAIN	2.0 FT
TYPE OF RISER PIPE	Schedule 40 PVC
I.D. AND O.D. OF RISER PIPE	2/2 3/8 in
TYPE OF BACKFILL AROUND RISER PIPE	See Seal
DEPTH TOP OF SEAL	2.0 FT
TYPE OF SEAL	Bentonite chips
DEPTH BOTTOM OF SEAL	4.5 FT
DIAMETER OF BOREHOLE	8 inches
DEPTH TOP OF PERVIOUS SECTION	6.5 FT
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2/2 3/8"
TYPE OF OPENINGS	0.010 Slot opening
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	13.5 FT
DEPTH OF BACKFILL	NA
TYPE OF BACKFILL	NA
END OF BORING	14 FT

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: CTO 178 UST Investigation — PAGE: 1 OF 1

PROJECT LOCATION: Davisville, RI NCBC

CLIENT: US NAVY — BORING NO.: ~~MW 2~~ 46-MW2

CONTRACTOR: EDI - Environmental Drilling Co. — DRILLER: S. LaMarch — BORING LOCATION: 46-MW2-SB (B) Area D

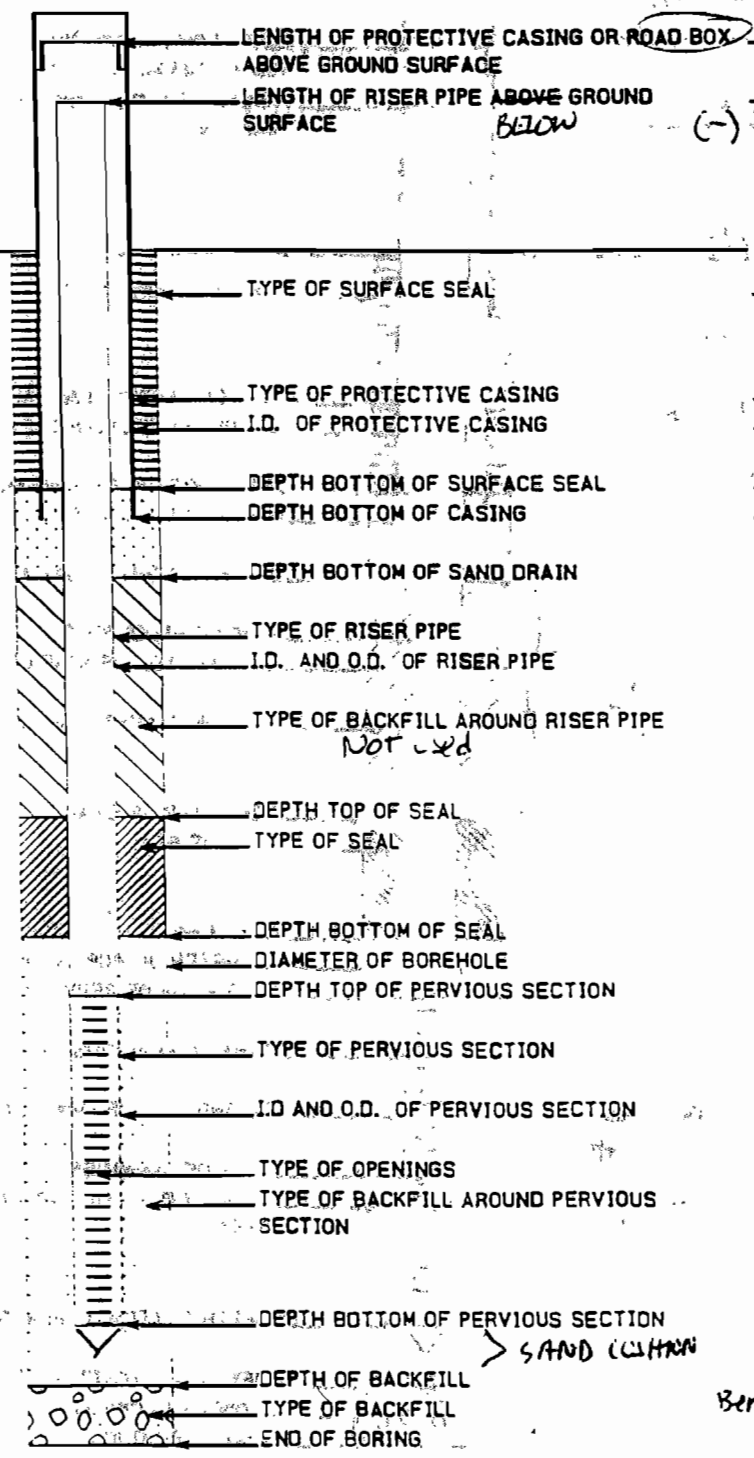
LOGGED BY: K. Jaikut — DATE: 7-6-94 — PROJECT NO.: 1905, CTO 178

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	Flush
LENGTH OF RISER PIPE ~~ABOVE~~ BELOW GROUND SURFACE	~~6.5 in~~ (-) 0.57 FT
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Cast Aluminum ~~Steel~~
I.D. OF PROTECTIVE CASING	7 in
DEPTH BOTTOM OF SURFACE SEAL	~~1 FT~~ 10 in
DEPTH BOTTOM OF CASING	1 FT
DEPTH BOTTOM OF SAND DRAIN	1.5 FT
TYPE OF RISER PIPE	Schedule 40 PVC
I.D. AND O.D. OF RISER PIPE	2" / 2 3/8"
TYPE OF BACKFILL AROUND RISER PIPE	Not used
DEPTH TOP OF SEAL	1.5 FT
TYPE OF SEAL	Bentonite Chips
DEPTH BOTTOM OF SEAL	2.5 FT
DIAMETER OF BOREHOLE	8 inches
DEPTH TOP OF PERVIOUS SECTION	3.5 FT
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2" / 2 3/8"
TYPE OF OPENINGS	0.010 slots
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	8.5 FT
SAND CUSHION	
DEPTH OF BACKFILL	9 FT
TYPE OF BACKFILL	Bentonite Chips & Sand
END OF BORING	18 FT

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: CTO-178 — PAGE: 1 OF 1

PROJECT LOCATION: BLDG. TANK 47

CLIENT: US NAVY — BORING NO.: ~~MW-1~~ ~~TM-7~~ 47-MW1

CONTRACTOR: ENVIRONMENTAL DRILLERS — DRILLER: C. Stamas — BORING LOCATION: UST 47 AREA D1

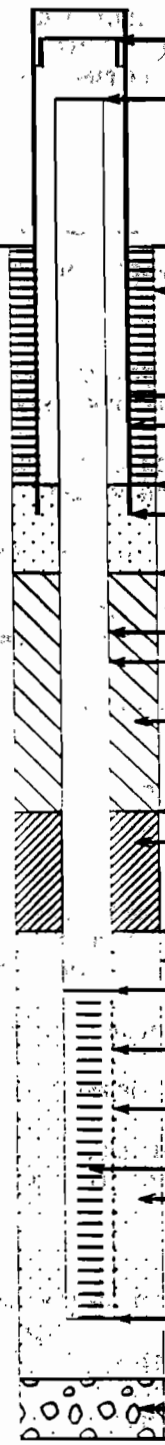
LOGGED BY: T. DORGAN / C. MARTIN — DATE: 7/6/94 — PROJECT NO.: 1905, CTO 178

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: N/M

ELEVATION TOP OF RISER PIPE: N/M

GROUND ELEVATION: N/M



LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	FLUSH TO GROUND ~~0.16~~
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	~~N/A~~ -0.16
TYPE OF SURFACE SEAL	CEMENT
TYPE OF PROTECTIVE CASING	CAST ALUMINUM
I.D. OF PROTECTIVE CASING	7 IN.
DEPTH BOTTOM OF SURFACE SEAL	10"
DEPTH BOTTOM OF CASING	1 FT.
DEPTH BOTTOM OF SAND DRAIN	~~2'~~
TYPE OF RISER PIPE	PVC
I.D. AND O.D. OF RISER PIPE	2.0 ID 2.375 OD
TYPE OF BACKFILL AROUND RISER PIPE	MORIE #1 SAND
DEPTH TOP OF SEAL	2'
TYPE OF SEAL	BENT. CHIPS
DEPTH BOTTOM OF SEAL	4'
DIAMETER OF BOREHOLE	4.25'
DEPTH TOP OF PERVIOUS SECTION	6'
TYPE OF PERVIOUS SECTION	P.V.C. SLOTTED
I.D AND O.D. OF PERVIOUS SECTION	2.0 ID 2 3/8 O.D
TYPE OF OPENINGS	10
TYPE OF BACKFILL AROUND PERVIOUS SECTION	MORIE #1 SAND
DEPTH BOTTOM OF PERVIOUS SECTION	16'
DEPTH OF BACKFILL	16.5'
TYPE OF BACKFILL	50/50 BENT./SAND
END OF BORING	20'

General soil conditions (not to scale)

2 CENTRALIZERS @ TOP + BOTTOM OF SCREEN

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: CTO 178 UST Investigation — PAGE: 1 OF 1

PROJECT LOCATION: Davisville Rhode Island NCBC

CLIENT: US Navy — BORING NO.: ~~MW 1~~ 48-MW1

CONTRACTOR: EDI — DRILLER: S. LaMarch — BORING LOCATION: UST 48 Area D1

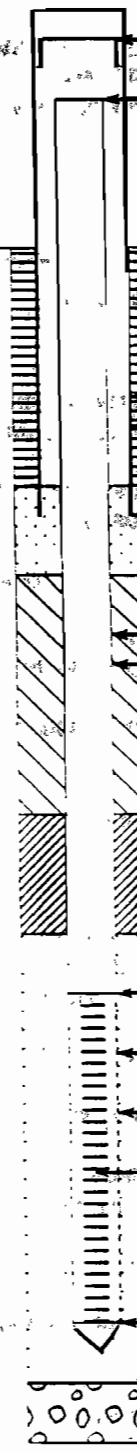
LOGGED BY: K. Walkut — DATE: 7-7-94 — PROJECT NO.: 1905 CTO178

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	1.9 FT ~~24.5 in~~
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	~~24.5 in~~ 1.58 FT
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Steel
I.D. OF PROTECTIVE CASING	4 in
DEPTH BOTTOM OF SURFACE SEAL	2.5 FT
DEPTH BOTTOM OF CASING	3 FT
DEPTH BOTTOM OF SAND DRAIN	4 FT
TYPE OF RISER PIPE	Schedule 40 PVC
I.D. AND O.D. OF RISER PIPE	2" / 2 3/8"
TYPE OF BACKFILL AROUND RISER PIPE	Bentonite Chips
DEPTH TOP OF SEAL	5.5 FT
TYPE OF SEAL	Bentonite chips
DEPTH BOTTOM OF SEAL	7.5 FT
DIAMETER OF BOREHOLE	8 in
DEPTH TOP OF PERVIOUS SECTION	9.5 FT
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2" / 2 3/8"
TYPE OF OPENINGS	0.010 slots
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	19.5 FT
DEPTH OF BACKFILL (SAND COSHION)	NA
TYPE OF BACKFILL	NA
END OF BORING	20 FT

General soil conditions (not to scale)

2 centralizers used.

6
1.90
32
58

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: CTO 178 NCBC UST Investigation — PAGE: 1 OF 1

PROJECT LOCATION: Davisville RI

CLIENT: US Navy — BORING NO.: ~~MW2~~ 48-MW2

CONTRACTOR: EDI — DRILLER: S LaMarch — BORING LOCATION: UST 48 Area D1

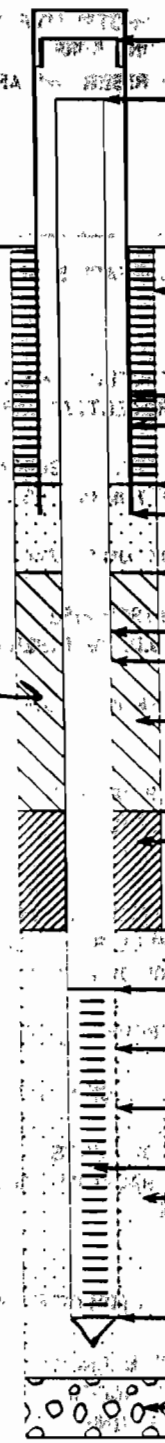
LOGGED BY: K. Valkut — DATE: 7-7-94 — PROJECT NO.: 1905, CTO 178

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



General soil conditions (not to scale)

▽ @ ~5' 7-7-94

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	Flush
LENGTH OF RISER PIPE ~~ABOVE~~ BELOW GROUND SURFACE	~~2.5 FT~~ (-) 0.58 FT
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Cast Aluminum
I.D. OF PROTECTIVE CASING	6-7 in
DEPTH BOTTOM OF SURFACE SEAL	10 in
DEPTH BOTTOM OF CASING	1 FT
DEPTH BOTTOM OF SAND DRAIN	2 FT
TYPE OF RISER PIPE	Schedule 40 PVC
I.D. AND O.D. OF RISER PIPE	2" / 2 3/8"
TYPE OF BACKFILL AROUND RISER PIPE	See Seal
DEPTH TOP OF SEAL	2 FT
TYPE OF SEAL	Bentonite Chips
DEPTH BOTTOM OF SEAL	3 FT
DIAMETER OF BOREHOLE	8 in
DEPTH TOP OF PERVIOUS SECTION	4 FT
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2" / 2 3/8"
TYPE OF OPENINGS	0.010 Slots
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	9 FT
DEPTH OF BACKFILL (Sand Cushion 9.5-9)	9.5 FT
TYPE OF BACKFILL	Bentonite Chips/Sa
END OF BORING	20 FT

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: ~~CTC-178~~ 1905-0220 PAGE: 1 OF 1

PROJECT LOCATION: ~~TANK 62~~ NCBC - DAVISVILLE RI

CLIENT: US NAVY BORING NO.: ~~MW~~ 62 - MW1

CONTRACTOR: ENVIRONMENTAL DRILLING DRILLER: CHRIS SIMMS BORING LOCATION: TANK 62 AREA D1

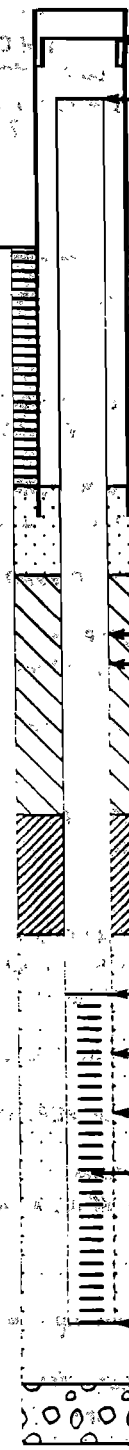
LOGGED BY: T. DORGAN DATE: 7/7/94 PROJECT NO.: CTC-178, 1905

CHECKED BY: DATE:

ELEVATION TOP OF PROTECTIVE CASING: FLUSH MOUNT

ELEVATION TOP OF RISER PIPE: FLUSH MOUNT

GROUND ELEVATION: NM



General soil conditions (not to scale)

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	FLUSH TO SURFACE
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	-0.34 ~~FEET~~ ~~4.5~~ 4.5" BELOW ROAD BOX LID.
TYPE OF SURFACE SEAL	CEMENT
TYPE OF PROTECTIVE CASING	CAST ALUMINUM
I.D. OF PROTECTIVE CASING	7 INCH
DEPTH BOTTOM OF SURFACE SEAL	6 INCH
DEPTH BOTTOM OF CASING	10 INCH
DEPTH BOTTOM OF SAND DRAIN	4'
TYPE OF RISER PIPE	SCHEDULE 40 PVC
I.D. AND O.D. OF RISER PIPE	2.0" ID / 2 3/8" OD
TYPE OF BACKFILL AROUND RISER PIPE	BENTONITE CHIPS
DEPTH TOP OF SEAL	5.5'
TYPE OF SEAL	BENTONITE CHIPS
DEPTH BOTTOM OF SEAL	7.5'
DIAMETER OF BOREHOLE	8"
DEPTH TOP OF PERVIOUS SECTION	9.5'
TYPE OF PERVIOUS SECTION	SCHEDULE 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2.0" ID 2 3/8" O.D.
TYPE OF OPENINGS	0.010 SLOTTED
TYPE OF BACKFILL AROUND PERVIOUS SECTION	MORIE #1 SAND/GRAVEL
DEPTH BOTTOM OF PERVIOUS SECTION	19.5'
DEPTH OF BACKFILL	19.5'
TYPE OF BACKFILL	#1 SAND
END OF BORING	20'

OVERBURDEN WELL CONSTRUCTION LOG — HALLIBURTON NUS ENVIRONMENTAL CORPORATION

PROJECT: CTO 178 UST Investigation — PAGE: 1 OF 1

PROJECT LOCATION: Davisville RI

CLIENT: US Navy — BORING NO.: ~~MW-1~~ 63-MW1

CONTRACTOR: EDI — DRILLER: S. Lamarch — BORING LOCATION: UST 63 Area 01

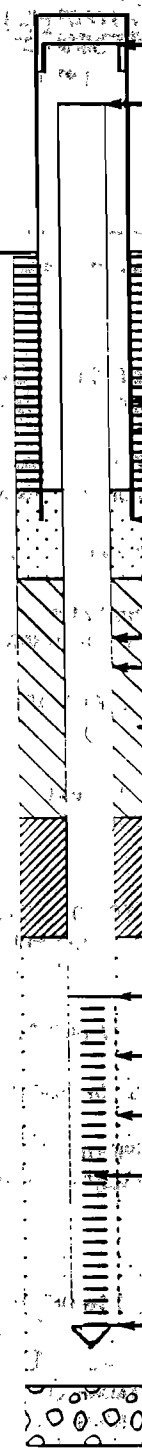
LOGGED BY: K Jalkut — DATE: 7-6-94 — PROJECT NO.: 1905, CTO 178

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	Flush
LENGTH OF RISER PIPE ~~ABOVE~~ BELOW GROUND SURFACE	(-)1.55 FT
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Cast Aluminum
I.D. OF PROTECTIVE CASING	7 in
DEPTH BOTTOM OF SURFACE SEAL	10 in
DEPTH BOTTOM OF CASING	1 FT
DEPTH BOTTOM OF SAND DRAIN	2'
TYPE OF RISER PIPE	Sched 40 PVC
I.D. AND O.D. OF RISER PIPE	2"/2 3/8"
TYPE OF BACKFILL AROUND RISER PIPE	See Seal
DEPTH TOP OF SEAL	2'
TYPE OF SEAL	Bentonite Chips
DEPTH BOTTOM OF SEAL	3'
DIAMETER OF BOREHOLE	8 in
DEPTH TOP OF PERVIOUS SECTION	4'
TYPE OF PERVIOUS SECTION	Sched 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2"/2 3/8"
TYPE OF OPENINGS	0.010 slots
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	9'
DEPTH OF BACKFILL	9.5'
TYPE OF BACKFILL	Bentonite Chips
END OF BORING	20'

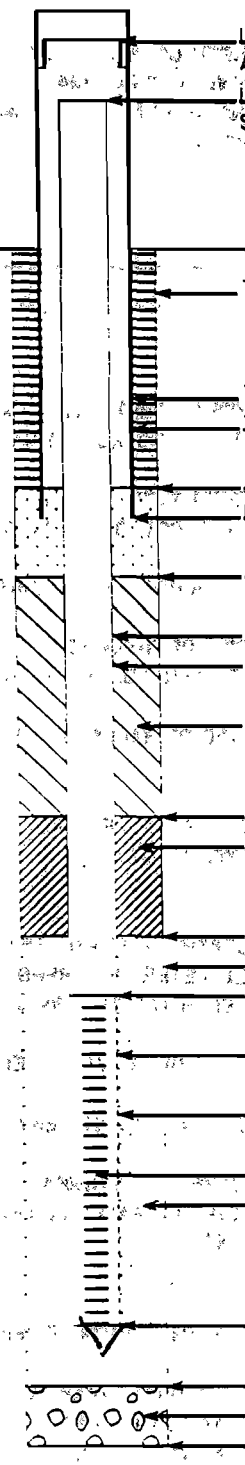
OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: CTO 178 UST Investigation
PAGE: 1 OF 1
PROJECT LOCATION: Dawsville RI
CLIENT: US NAVY
BORING NO.: ~~MW~~ 1 - 71 - MW1
CONTRACTOR: EDI
DRILLER: S. LaMarch
BORING LOCATION: UST 71 Area D1
LOGGED BY: K Jalkut
DATE: 7-8-94
PROJECT NO.: 1905, CTO 178
CHECKED BY:
DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



General soil conditions (not to scale)

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	2 FT
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	1.76 FT
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Steel
I.D. OF PROTECTIVE CASING	4 in
DEPTH BOTTOM OF SURFACE SEAL	2.5 FT
DEPTH BOTTOM OF CASING	3 FT
DEPTH BOTTOM OF SAND DRAIN	4 FT
TYPE OF RISER PIPE	Sched 40 PVC
I.D. AND O.D. OF RISER PIPE	2" / 2 3/8"
TYPE OF BACKFILL AROUND RISER PIPE	Bent Chips
DEPTH TOP OF SEAL	5.5 FT
TYPE OF SEAL	Bent Chips
DEPTH BOTTOM OF SEAL	7.5 FT
DIAMETER OF BOREHOLE	6 in
DEPTH TOP OF PERVIOUS SECTION	9.5 FT
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2" / 2 3/8"
TYPE OF OPENINGS	0.010 slots
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	19.5'
DEPTH OF BACKFILL	NA
TYPE OF BACKFILL	NA
END OF BORING	20 FT

SAND CUSHION 20-19.5'

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: CTO 178 UST Investigation — PAGE: 1 OF 1

PROJECT LOCATION: Davisville RI

CLIENT: US Navy — BORING NO.: ~~MW-1~~ 65-MW1

CONTRACTOR: EDI — DRILLER: S. LaMarch — BORING LOCATION: 65-MW1 Area D1

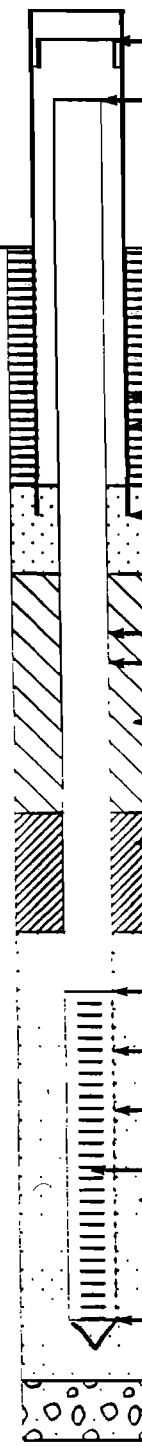
LOGGED BY: K Jalkut — DATE: 7-8-89 — PROJECT NO.: 1905, CTO178

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: Nm

ELEVATION TOP OF RISER PIPE: Nm

GROUND ELEVATION: Nm



General soil conditions (not to scale)

1 centralizer used

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	2.08'
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	1.85'
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Steel
I.D. OF PROTECTIVE CASING	8 in
DEPTH BOTTOM OF SURFACE SEAL	2.5 FT
DEPTH BOTTOM OF CASING	3 FT
DEPTH BOTTOM OF SAND DRAIN	4 FT
TYPE OF RISER PIPE	Sched 40 PVC
I.D. AND O.D. OF RISER PIPE	2"/2 3/8"
TYPE OF BACKFILL AROUND RISER PIPE	See Seal
DEPTH TOP OF SEAL	4 FT
TYPE OF SEAL	Bent Chips
DEPTH BOTTOM OF SEAL	6 FT
DIAMETER OF BOREHOLE	8 in
DEPTH TOP OF PERVIOUS SECTION	8 FT
TYPE OF PERVIOUS SECTION	Sched 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2"/2 3/8"
TYPE OF OPENINGS	0.010 slots
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	13 FT
DEPTH OF BACKFILL	13 FT
TYPE OF BACKFILL	Silica Sand
END OF BORING	14.5

UST AREA D2

OVERBURDEN WELL CONSTRUCTION LOG — HALLIBURTON NUS ENVIRONMENTAL CORPORATION

PROJECT: CTO 178 UST Investigation — PAGE: 1 OF 1

PROJECT LOCATION: Danville RI

CLIENT: NAVFAC CORLENG — BORING NO.: ~~MW-1~~ 10-MW1

CONTRACTOR: CDI — DRILLER: S. Lallinach — BORING LOCATION: UST 10, Area D2

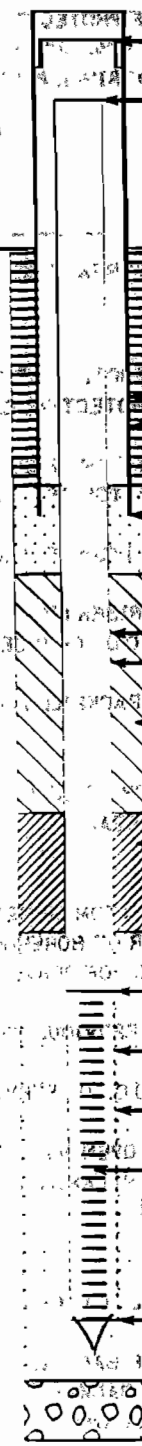
LOGGED BY: K. Jalkut — DATE: 7-12-99 — PROJECT NO.: CTC 178, 1905

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	0.0
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	-.34
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Cast Aluminum
I.D. OF PROTECTIVE CASING	
DEPTH BOTTOM OF SURFACE SEAL	10 in
DEPTH BOTTOM OF CASING	1 FT
DEPTH BOTTOM OF SAND DRAIN	2 FT
TYPE OF RISER PIPE	Sched 40 PVC
I.D. AND O.D. OF RISER PIPE	2" / 2 3/8"
TYPE OF BACKFILL AROUND RISER PIPE	See Seal
DEPTH TOP OF SEAL	2 FT
TYPE OF SEAL	Bent Chips
DEPTH BOTTOM OF SEAL	5 FT
DIAMETER OF BOREHOLE	8 IN
DEPTH TOP OF PERVIOUS SECTION	7 FT
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2" / 2 3/8"
TYPE OF OPENINGS	0.010 slots
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	12 FT
DEPTH OF BACKFILL	12.5 FT
TYPE OF BACKFILL	Bent Chips + Sa
END OF BORING	14 FT

1st time - driller advanced hole to 14'
Problem once w/ construction - rod got hung up around seal area and driller ended up pulling out flights.
He will redrill in same location to 12'

1 Centralizer

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: CTO 178 UST Investigation — PAGE: 1 OF 1

PROJECT LOCATION: Dawsville PI

CLIENT: NAVFAC ENG COM — BORING NO.: ~~MW~~ 2 10-MW 2

CONTRACTOR: EDI — DRILLER: S. Laimch — BORING LOCATION: UST 10 Area D2

LOGGED BY: K Walker — DATE: 7-12-94 — PROJECT NO.: N05 CTO 178

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM

General soil conditions (not to scale)

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	Flush
LENGTH OF RISER PIPE ~~ABOVE~~ BELOW GROUND SURFACE	-.39
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Cast Aluminum
I.D. OF PROTECTIVE CASING	
DEPTH BOTTOM OF SURFACE SEAL	10 in
DEPTH BOTTOM OF CASING	1 FT
DEPTH BOTTOM OF SAND DRAIN	2 FT
TYPE OF RISER PIPE	Sched 40 PVC
I.D. AND O.D. OF RISER PIPE	2"/2 3/8"
TYPE OF BACKFILL AROUND RISER PIPE	See Seal
DEPTH TOP OF SEAL	2 FT
TYPE OF SEAL	Bent. Chips
DEPTH BOTTOM OF SEAL	4 FT
DIAMETER OF BOREHOLE	8 in
DEPTH TOP OF PERVIOUS SECTION	6 FT
TYPE OF PERVIOUS SECTION	Sched 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2"/2 3/8"
TYPE OF OPENINGS	0.010 slots
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	16 FT
DEPTH OF BACKFILL	16.5
TYPE OF BACKFILL	Bent chips / sand
END OF BORING	20'

UST AREA E

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: CTO 178 UST Investigation — PAGE: 1 OF 1

PROJECT LOCATION: Dawsonville RI

CLIENT: NAVFAC ENGLOM — BORING NO.: ~~MW-1~~ 68-MW1

CONTRACTOR: EDI — DRILLER: S. Lavinski — BORING LOCATION: UST 68 Area E

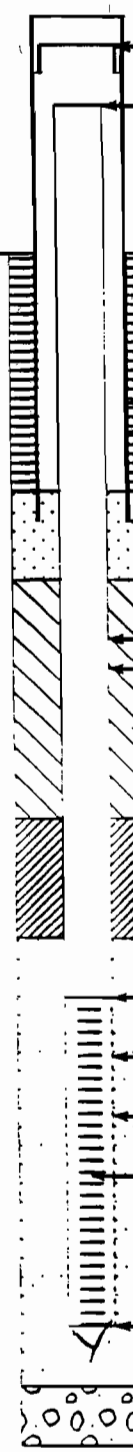
LOGGED BY: K Jalkut — DATE: 7-11-94 — PROJECT NO.: 1905, CTO 178

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	Road Box
LENGTH OF RISER PIPE ~~ABOVE~~ Below GROUND SURFACE	(-) 0.58 FT
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Cast Aluminum
I.D. OF PROTECTIVE CASING	7 in
DEPTH BOTTOM OF SURFACE SEAL	10 in
DEPTH BOTTOM OF CASING	1 FT
DEPTH BOTTOM OF SAND DRAIN	2 FT
TYPE OF RISER PIPE	Sched 40 PVC
I.D. AND O.D. OF RISER PIPE	2 / 2 3/8"
TYPE OF BACKFILL AROUND RISER PIPE	See Seal
DEPTH TOP OF SEAL	2 FT
TYPE OF SEAL	Bent Chips
DEPTH BOTTOM OF SEAL	3 FT
DIAMETER OF BOREHOLE	8 in
DEPTH TOP OF PERVIOUS SECTION	4 FT
TYPE OF PERVIOUS SECTION	Sched 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2 / 2 3/8"
TYPE OF OPENINGS	0.010 slots
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	10 FT
DEPTH OF BACKFILL (Sand Cushion 10.5-10)	10.5
TYPE OF BACKFILL	Bent Chips / Sand
END OF BORING	20

General soil conditions (not to scale)

Material not constructed

1 centralizer

UST AREA F1

OVERBURDEN WELL CONSTRUCTION LOG — HALLIBURTON NUS ENVIRONMENTAL CORPORATION

PROJECT: 1905-0220 UST INVEST. — PAGE: 1 OF 1

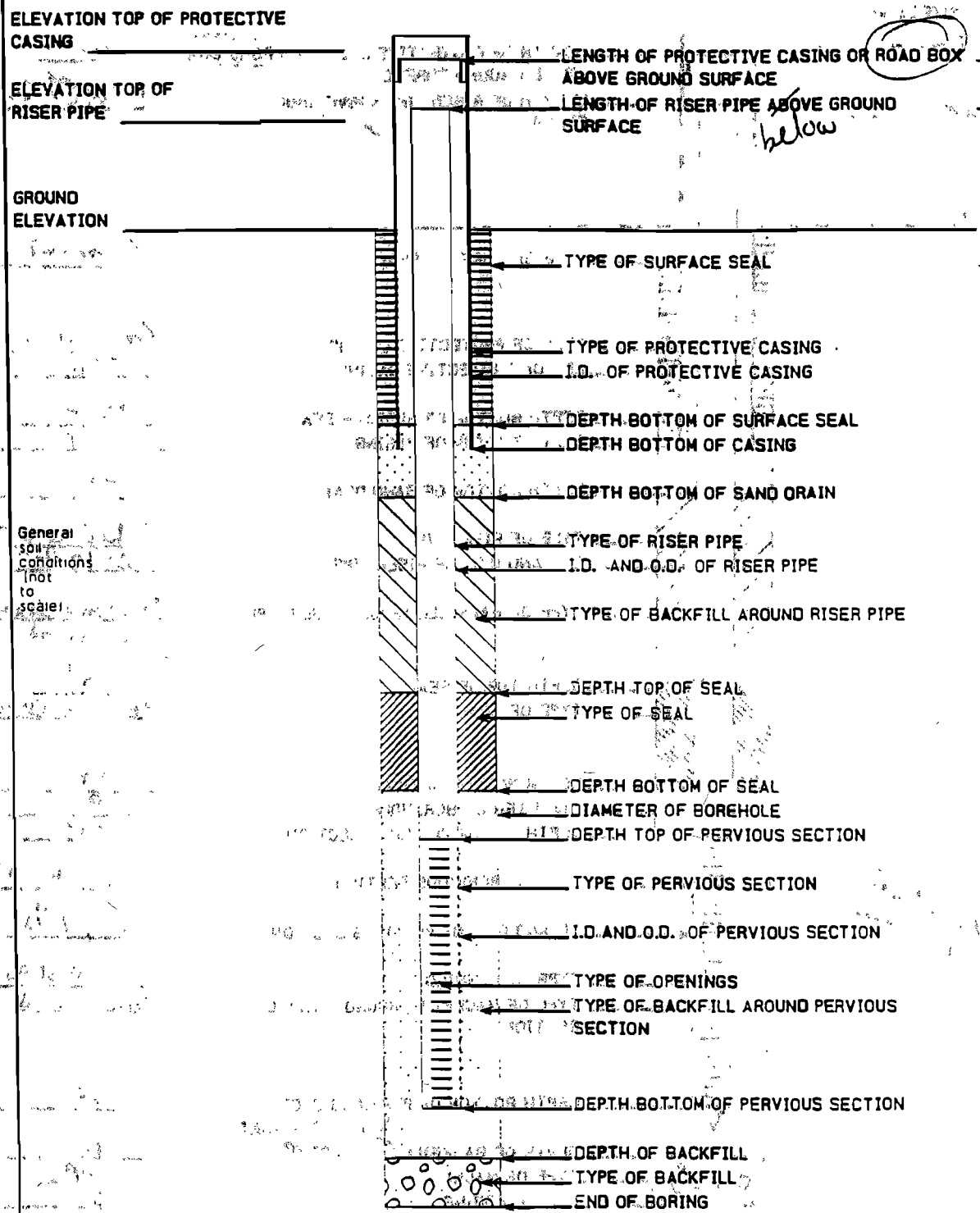
PROJECT LOCATION: DAVISVILLE RI NCBC

CLIENT: US NAVY — BORING NO.: ~~MW-1~~ 25-MW1

CONTRACTOR: ENVIRONMENTAL DRILLING INC — DRILLER: J. STAMAS — BORING LOCATION: UST-25 Area F1

LOGGED BY: T. DORGAN — DATE: 7/20/94 — PROJECT NO.: CTO-178

CHECKED BY: — DATE:



ELEVATION TOP OF PROTECTIVE CASING	
LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	Flush
ELEVATION TOP OF RISER PIPE	
LENGTH OF RISER PIPE ~~ABOVE~~ below GROUND SURFACE	-0.38 FT
GROUND ELEVATION	
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Cast Alum
I.D. OF PROTECTIVE CASING	7 inches
DEPTH BOTTOM OF SURFACE SEAL	
DEPTH BOTTOM OF CASING	10"
DEPTH BOTTOM OF SAND DRAIN	3'
TYPE OF RISER PIPE	SCHED. 40 PVC
I.D. AND O.D. OF RISER PIPE	2" ID 2 3/8" OD
TYPE OF BACKFILL AROUND RISER PIPE	VOLCLAY BENTONITE GROUT
DEPTH TOP OF SEAL	15'
TYPE OF SEAL	BENTONITE CHIP
DEPTH BOTTOM OF SEAL	17'
DIAMETER OF BOREHOLE	8"
DEPTH TOP OF PERVIOUS SECTION	20'
TYPE OF PERVIOUS SECTION	SCHED. 40 PVC
I.D. AND O.D. OF PERVIOUS SECTION	2" ID 2 3/8" OD
TYPE OF OPENINGS	0.010 SLOTTED
TYPE OF BACKFILL AROUND PERVIOUS SECTION	#1 SILICA SAND
DEPTH BOTTOM OF PERVIOUS SECTION	30'
DEPTH OF BACKFILL	30'
TYPE OF BACKFILL	#1 SILICA SAND
END OF BORING	35'

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: CTO 178 — PAGE: 1 OF 1

PROJECT LOCATION: Davisville Rhode Island

CLIENT: NAVY — BORING NO.: ~~MW~~ 26-MW1

CONTRACTOR: EDI — DRILLER: S. Lamarche — BORING LOCATION: UST 26 Bldg 224 (F1)

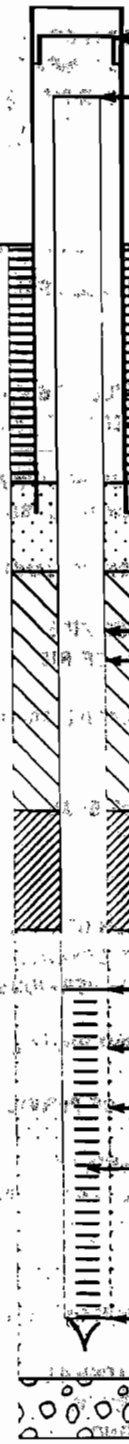
LOGGED BY: K. Jalkut — DATE: 7-19-94 / 7-20-94 — PROJECT NO.: 405, CTO 178

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



General soil conditions (not to scale)

2 centralizers on screen

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	Flush
LENGTH OF RISER PIPE ~~ABOVE~~ BELOW GROUND SURFACE	(-) ~~1.0~~ 0.39'
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Cast Aluminum
I.D. OF PROTECTIVE CASING	7 in
DEPTH BOTTOM OF SURFACE SEAL	10 in
DEPTH BOTTOM OF CASING	1 FT
DEPTH BOTTOM OF SAND DRAIN	2'
TYPE OF RISER PIPE	Schedule 40 PVC
I.D. AND O.D. OF RISER PIPE	2" / 2 3/8"
TYPE OF BACKFILL AROUND RISER PIPE	Bentonite Slurry / Pelle to 2' Sand
DEPTH TOP OF SEAL	15'
TYPE OF SEAL	Bentonite Chips
DEPTH BOTTOM OF SEAL	17'
DIAMETER OF BOREHOLE	8 in
DEPTH TOP OF PERVIOUS SECTION	19'
TYPE OF PERVIOUS SECTION	Sched 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2" / 2 3/8"
TYPE OF OPENINGS	0.010 slots
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	29'
DEPTH OF BACKFILL (SAND CUSHION 30-29')	N/A
TYPE OF BACKFILL	N/A
END OF BORING	30'

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: CTO 178 UST Investigation — PAGE: 1 OF 1

PROJECT LOCATION: Davisville RI

CLIENT: USN — BORING NO.: ~~MW-2~~ 26-MW2

CONTRACTOR: EDI — DRILLER: S. Lamarche — BORING LOCATION: UST 26 Area F1

LOGGED BY: K. Jalkut — DATE: 7-20/7-21 — PROJECT NO.: 1905

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM

LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	Flush
LENGTH OF RISER PIPE ~~ABOVE~~ BELOW GROUND SURFACE	(-) 0.35 FT
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Cast Aluminum
I.D. OF PROTECTIVE CASING	7 in
DEPTH BOTTOM OF SURFACE SEAL	10 in
DEPTH BOTTOM OF CASING	1 FT
DEPTH BOTTOM OF SAND DRAIN	2 FT
TYPE OF RISER PIPE	Schedule 40 PVC
I.D. AND O.D. OF RISER PIPE	2" / 2 3/8"
TYPE OF BACKFILL AROUND RISER PIPE	Bentonite Slurry to 6 FT; Pellets to 2 FT
DEPTH TOP OF SEAL	16 FT
TYPE OF SEAL	Bentonite ~~Sheet~~ Chips
DEPTH BOTTOM OF SEAL	18 FT
DIAMETER OF BOREHOLE	8 in
DEPTH TOP OF PERVIOUS SECTION	20 FT
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2" / 2 3/8"
TYPE OF OPENINGS	0.010 slots.
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	30 FT
DEPTH OF BACKFILL	N/A
TYPE OF BACKFILL	N/A
END OF BORING	30 FT

General soil conditions (not to scale)

NO SAND CUSHION

2 centralizers used

H_2O Table - ~20 FT 7-20-94

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: CTO 178 UST Investigation — PAGE: 1 OF 1

PROJECT LOCATION: Davisville RI

CLIENT: USN — BORING NO.: ~~MW3~~ 26-MW3

CONTRACTOR: EDI — DRILLER: S. Lamarche — BORING LOCATION: UST 26 Area F1

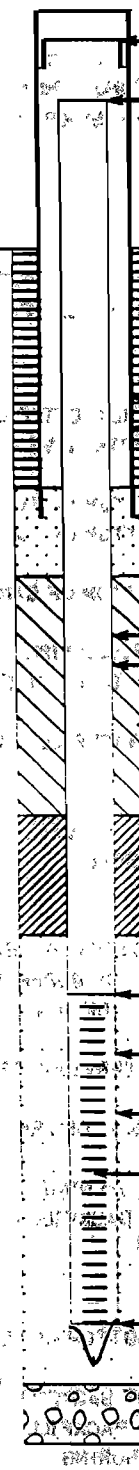
LOGGED BY: K Jalkut — DATE: 7-21-94 — PROJECT NO.:

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	Flush
LENGTH OF RISER PIPE ~~ABOVE~~ BELOW GROUND SURFACE	(-) ~~4.5 in~~ 0.33 FT
TYPE OF SURFACE SEAL	Cement
TYPE OF PROTECTIVE CASING	Cast Aluminum
I.D. OF PROTECTIVE CASING	7 in
DEPTH BOTTOM OF SURFACE SEAL	10 in
DEPTH BOTTOM OF CASING	1 FT
DEPTH BOTTOM OF SAND DRAIN	2 FT
TYPE OF RISER PIPE	Schedule 40 PVC
I.D. AND O.D. OF RISER PIPE	2" / 2 3/8"
TYPE OF BACKFILL AROUND RISER PIPE 2:1 ratio	Bentonite Slurry (Grout - Vol/clay) w/sand to 4'; Pellets to 3'
DEPTH TOP OF SEAL	16 FT
TYPE OF SEAL	Bentonite Chips
DEPTH BOTTOM OF SEAL	18 FT
DIAMETER OF BOREHOLE	8 in
DEPTH TOP OF PERVIOUS SECTION	20 FT
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2" / 2 3/8"
TYPE OF OPENINGS	0.010 slots
TYPE OF BACKFILL AROUND PERVIOUS SECTION	Silica Sand
DEPTH BOTTOM OF PERVIOUS SECTION	30'
DEPTH OF BACKFILL (sand cushion (1'))	N/A
TYPE OF BACKFILL	N/A
END OF BORING	31'

General soil conditions (not to scale)

2 centralizers used

OVERBURDEN WELL CONSTRUCTION LOG — **HALLIBURTON NUS ENVIRONMENTAL CORPORATION**

PROJECT: 1905-0220 - UST INVESTIGATION — PAGE: 1 OF 1

PROJECT LOCATION: DANVILLE RI. - N.C.B.C.

CLIENT: U.S. NAVY — BORING NO.: ~~MW-1~~ 66-MW1

CONTRACTOR: ENVIRONMENTAL DRILLING INC. — DRILLER: C. STAMAS — BORING LOCATION: UST-66 AREA F1

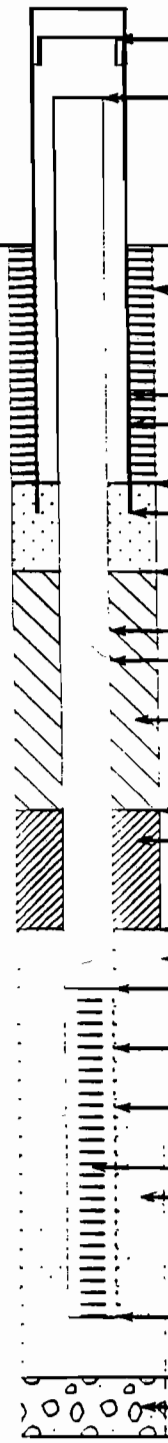
LOGGED BY: T. DORGAN — DATE: 7/19/94 — PROJECT NO.: CTO-178, 1905

CHECKED BY: — DATE:

ELEVATION TOP OF PROTECTIVE CASING: NM

ELEVATION TOP OF RISER PIPE: NM

GROUND ELEVATION: NM



LENGTH OF PROTECTIVE CASING OR ROAD BOX ABOVE GROUND SURFACE	FLUSH TO SUR
LENGTH OF RISER PIPE ABOVE GROUND SURFACE	~~E~~ -0.33'
TYPE OF SURFACE SEAL	CEMENT
TYPE OF PROTECTIVE CASING	CAST ALUMIN
I.D. OF PROTECTIVE CASING	7"
DEPTH BOTTOM OF SURFACE SEAL	8"
DEPTH BOTTOM OF CASING	10"
DEPTH BOTTOM OF SAND DRAIN	~~[illegible]~~
TYPE OF RISER PIPE	SCHED. 40 PVC
I.D. AND O.D. OF RISER PIPE	2" ID 2 3/8" OD
TYPE OF BACKFILL AROUND RISER PIPE	BENTONITE SLUR
DEPTH TOP OF SEAL	15'
TYPE OF SEAL	BONT. CHIPS
DEPTH BOTTOM OF SEAL	17'
DIAMETER OF BOREHOLE	8"
DEPTH TOP OF PERVIOUS SECTION	20'
TYPE OF PERVIOUS SECTION	SCHED. 40 PVC
I.D AND O.D. OF PERVIOUS SECTION	2" ID 2 3/8" OD
TYPE OF OPENINGS	0.010 SLOTTED
TYPE OF BACKFILL AROUND PERVIOUS SECTION	#1 SILICA SAND
DEPTH BOTTOM OF PERVIOUS SECTION	30'
DEPTH OF BACKFILL	30'
TYPE OF BACKFILL	#1 SILICA SAND
END OF BORING	31'

General soil conditions (not to scale)

APPENDIX D

RESULTS FROM HEADSPACE SCREENING ANALYSIS

TABLE D-1
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 3
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
3-MW1	2-4	ND	
	4-6	0.2	66
	6-8	ND	
	8-10	0.2	
	10-12	ND	
	12-14	ND	
	14-16	ND	
	16-18	ND	
	18-20	ND	18
3-B1	2-4	ND	
	4-6	ND	
	6-8	ND	
	6-10	ND	ND
	10-12	ND	160
3-B2	2-4	ND	
	4-6	4	20
	6-8	2	
	8-10	ND	
	10-12	ND	50

TABLE D-2
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 5
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
5-B1	2-4	ND	
	4-6	50	330
	6-8	25	
	8-10	24	1300
	10-12	ND	
5-B2	2-4	ND	
	4-6	4	44
	6-8	2	180
	8-10	ND	

TABLE D-3
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 6
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
6-MW1	2-4	ND	ND
	4-6	ND	
	6-8	ND	
	8-10	ND	47
	10-12	ND	
	12-14	0.2	
	14-16	ND	
	16-18	ND	
	18-20	0.2	
6-B1	2-4	ND	470
	4-6	ND	
	6-8	ND	
	8-10	ND	
	10-12	ND	120
6-B2	2-4	ND	29
	4-6	ND	
	6-8	ND	
	8-10	ND	
	10-12	ND	ND

TABLE D-4
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 7
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
7-B1	2-4	ND	
	4-6	ND	
	6-8	ND	ND
	8-10	ND	
	10-12	ND	
	12-14	ND	
	14-16	ND	ND
7-B2	2-4	5	
	4-6	8	
	6-8	20	
	8-10	20	2000
	10-12	10	ND

TABLE D-5
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 11-22
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
11-MW1	2-4	ND	
	4-6	ND	
	6-8	ND	
	8-10	NR	
	10-12	2	59
	12-14	>1000	340
	14-16	600	
	16-18	100	
	18-20	150	54
11-MW2	2-4		
	4-6		72
	6-8	ND	
	8-10	ND	
	10-12	ND	
	12-14	ND	
	14-16	ND	
	16-18	ND	
	18-20	ND	
11-MW3	2-4	NR	
	4-6	ND	
	6-8	ND	
	8-10	70	
	10-12	900	
	12-14	>1000	3600
	14-16	300	
	16-18	600	
	18-20	>1000	130
11-B1	2-4	100	
	4-6	1	
	6-8	1	
	8-10	2	
	10-12	8	
	12-14	5	48
11-B2	2-4	ND	
	4-6	ND	
	6-8	ND	
	8-10	ND	
	10-12	850	120
	12-14	400	
	14-16	200	
	16-18	150	
	18-20	50	55

TABLE D-6
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 56
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
56-MW1	2-4	ND	
	4-6	ND	
	6-8	500	38A
	8-10	>1000	
	10-12	>1000	
	12-14	200	
	14-16	40	
	16-18	1	
	18-20	1	
56-B1	2-4	ND	
	4-6	ND	
	6-8	20	
	8-10	>1000	91
	10-12	>1000	
	12-14	400	
	14-16	350	
	16-18	500	
	18-20	400	ND
56-B2	2-4	ND	
	4-6	ND	
	6-8	35	ND
	8-10	30	
	10-12	5	
	12-14	6	ND

TABLE D-7
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 58
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
58-MW1	2-4	1	ND
	4-6	1	
	6-8	0.2	
	8-10	ND	
	10-12	1	
	12-14	1	
	14-16	ND	
	16-18	ND	
	18-20	ND	13
58-B1	2-4	ND	
	4-6	58	760 (J)
	6-8	26	
	8-10	21	
	10-12	2	
	12-14	0.8	24 (J)
58-B2	2-4	1	29
	4-6	12	
	6-8	6	
	8-10	2	
	10-12	2	28

TABLE D–8
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 46
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
46–MW1	2–4	ND	
	4–6	100	1500
	6–8	100	
	8–10	50	
	10–12	60	
	12–14	50	430A
46–MW2	2–4	600	
	4–6	800	240
	6–8	700	
	8–10	100	
	10–12	80	
	12–14	50	
	14–16	20	
	16–18	7	78

TABLE D–9
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 47
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
47–MW1	2–4	>1000	
	4–6	200	
	6–8	>1000	
	8–10	210	112A
	10–12	190	
	12–14	180	
	14–16	350	
	16–18	350	
	18–20	20	87
47–B1	2–4	200	
	4–6	600	240
	6–8	600	110
	8–10	250	
	10–12	200	
	12–14	120	
	14–16	35	
	16–18	40	
	18–20	35	190
47–B2	2–4	150	
	4–6	200	
	6–8	200	94
	8–10	200	
	10–12	120	
	12–14	20	110
	14–16	20	

TABLE D-10
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 48
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
48-MW1	2-4	>100	
	4-6	>1000	520
	6-8	700	
	8-10	>100	
	10-12	>100	
	12-14	350	
	14-16	>150	
	16-18	200	
	18-20	300	180
48-MW2	2-4	60	
	4-6	600	760
	6-8	700	
	8-10	350	
	10-12	300	
	12-14	250	
	14-16	100	
	16-18	180	
	18-20	50	160

TABLE D-11
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 62
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
62-MW1	2-4	200	110
	4-6	80	
	6-8	20	
	8-10	30	
	10-12	15	
	12-14	5	
	14-16	4	
	16-18	ND	
	18-20	20	270
62-B1	2-4	2	
	4-6	1	
	6-8	3	330
	8-10	2	
	10-12	2	
	12-14	2	380 (J)
B2	2-4	1	
	4-6	250	
	6-8	680	5300 (J)
	8-10	500	
	10-12	220	
	12-14	75	
	14-16	40	
	16-18	2	
	18-20	60	86 (J)

TABLE D–12
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 63, 71
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
63–MW1	2–4	45	
	4–6	100	
	6–8	100	570 (J)
	8–10	ND	430 (J)
	10–12	5	
	12–14	2	
	14–16	ND	
	16–18	ND	
	18–20	ND	
71–MW1	2–4	20	
	4–6	20	
	6–8	100	
	8–10	100	57 (J)
	10–12	50	
	12–14	40	
	14–16	10	16 (J)
	16–18	10	
	18–20	ND	

TABLE D–13
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 64
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
64–B1	2–4	60	47
	4–6	2.5	
	6–8	15	
	8–10	10	
	10–12	8	89
64–B2	2–4	20	39
	4–6	10	
	6–8	2	
	8–10	2	
	10–12	0.5	55

TABLE D-14
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 65
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
65-MW1	2-4	ND	
	4-6	ND	
	6-8	ND	
	8-10	ND	
	10-12	ND	UR
	12-14	ND	16 (J)
65-B1	2-4	1	73 (J)
	4-6	ND	
	6-8	ND	
	8-10	ND	
	10-12	ND	39 (J)
65-B2	2-4	ND	
	4-6	ND	71A (J)
	6-8	ND	
	8-10	2	120 (J)
	10-12	2	310 (J)

TABLE D-15
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 10
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
10-MW1	2-4	35	
	4-6	250	160
	6-8	15	65
	8-10	5	
	10-12	2	
	12-14	3	
10-MW2	2-4	ND	
	4-6	2	
	6-8	10	17
	8-10	5	
	10-12	5	130

TABLE D-16
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 68
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
68-MW1	2-4	>1000	65
	4-6	450	
	6-8	100	
	8-10	4	ND
	10-12	1.5	
	12-14	10	
	14-16	8	
	16-18	1.5	
	18-20	3	
68-B1	2-4	150	
	4-6	200	ND
	6-8	5	
	8-10	50	
	10-12	5	ND
68-B2	2-4	700	24 A
	4-6	150	
	6-8	50	
	8-10	ND	ND
	10-12	9.5	

TABLE D-17
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 25
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
25-MW1	2-4	1	
	4-6	0.4	
	6-8	0.5	
	8-10	0.2	
	10-12	0.5	
	12-14	0.8	
	14-16	0.2	
	16-18	0.2	
	18-20	0.2	
	20-22	0.8	
	22-24	1.5	
	24-26	1	
	26-28	1.8	14 (J)
	28-30	0.7	30 (J)
25-B1	2-4	ND	
	4-6	ND	
	6-8	0.2	210A (J)
	8-10	ND	
	10-12	0.5	16 (J)
25-B2	2-4	ND	
	4-6	0.8	30 (J)
	6-8	2.2	
	8-10	1.2	
	10-12	0.4	45A
25-B3	2-4	3.5	NR
	4-6	0.2	
	6-8	0.2	
	8-10	0.5	
	10-12	0.2	49 (J)

TABLE D-18
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 26
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
26-MW1	2-4	ND	15 (J)
	4-6	ND	
	6-8	ND	
	8-10	ND	
	10-12	ND	
	12-14	ND	
	14-16	ND	
	16-18	ND	
	18-20	ND	22 (J)
	20-22	1.5	
	22-24	0.5	
	24-26	0.3	
	26-28	1.5	
	28-30	ND	
26-B1	2-4	ND	
	4-6	ND	
	6-8	ND	ND
	8-10	ND	13 (J)
	10-12	ND	
26-B2	2-4	ND	
	4-6	ND	
	6-8	ND	25 (J)
	8-10	ND	23 (J)
	10-12	ND	
26-MW2	2-4	ND	
	4-6	ND	
	6-8	ND	
	8-10	ND	42 (J)
	10-12	ND	
	12-14	ND	
	14-16	ND	
	16-18	ND	
	18-20	ND	27 (J)
	20-22	ND	
	22-24	ND	
	24-26	ND	
	26-28	0.5	
	28-30	0.5	
26-MW3	2-4	ND	
	4-6	2	360 (J)
	6-8	ND	
	8-10	ND	
	10-12	0.5	
	12-14	ND	
	14-16	ND	
	16-18	ND	
	18-20	ND	27 (J)
	20-22	ND	
	22-24	ND	
	24-26	ND	
	26-28	ND	
	28-30	ND	

TABLE D-19
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 66
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
66-MW1	2-4	3.5	780 (J)
	4-6	2	
	6-8	2	
	8-10	0.5	
	10-12	2.5	
	12-14	0.2	
	14-16	ND	
	16-18	ND	
	18-20	0.4	ND
	20-22	0.5	
66-B1	2-4	30	1300 (J)
	4-6	3	
	6-8	NR	
	8-10	0.5	
	10-12	2.5	
	12-14	0.5	56 (J)

TABLE D-20
SUMMARY OF ANALYTICAL RESULTS
SOIL SAMPLES
FORMER UST LOCATION NO. 37-40
FORMER NCBC UST RI
DAVISVILLE, RHODE ISLAND

Boring/ Well No.	Sample Interval	VOC Screening Result	TPH Lab Result
38-B1	2-4	ND	
	4-6	ND	
	6-8	ND	1800
	8-10	ND	
	10-12	ND	440
38-B2	2-4	ND	
	4-6	ND	
	6-8	ND	70
	8-10	ND	
	10-12	0.5	53

APPENDIX E

RESULTS FROM LABORATORY ANALYSIS

APPENDIX E-1

SOIL SAMPLES FROM BORING/WELL INSTALLATION

UST AREA A1

TPHS01 SDG 381

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		3B1SB0810		3B1SB1012	3MW1SB0406	3MW1SB1820	3B2SB0406
LABORATORY ID:		B4031901		B4031902	B4031903	B4031904	B4031905
INORGANIC SOILS (MG/KG)							
ANALYTE	RDL						
TOTAL PETROLEUM HYDROCARBONS	12.5	12.5	U	160	66	18	20
% SOLIDS:		94.0		92.0	91.0	78.0	89.0

TPHS01 SPG 631

1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		7B1SB0608		7B1SB1416		7B2SB0810	7B2SB1012		3B2SB1012
LABORATORY ID:		B4031501		B4031502		B4031503	B4031504		B4031906
INORGANIC SOILS (MG/KG)									
ANALYTE	RDL								
TOTAL PETROLEUM HYDROCARBONS	12.5	12.5	U	12.5	U	2000	12.5	U	50
% SOLIDS:		97.0		80.0		97.0	79.0		94.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		7B2SB1012		7B2SB0204
LABORATORY ID:		B4031508		B4031507

INORGANIC SOILS (MG/KG)

ANALYTE	RDL			
TOTAL PETROLEUM HYDROCARBONS	12.5	12.5	U	29
% SOLIDS:		78.0		96.0

TPH SO2 SDG 6B2

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		7B1SB1012	6MW1SB0204	7B1SB0204	6MW1SB0810
LABORATORY ID:		B4031511	B4031512	B4031513	B4031514
INORGANIC SOILS (MG/KG)					
ANALYTE	RDL				
TOTAL PETROLEUM HYDROCARBONS	12.5	120	12.5 U	470	47
% SOLIDS:		86.0	94.0	86.0	93.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		11B2SB1820	11B2SB1012
LABORATORY ID:		B4031916	B4031915

INORGANIC SOILS (MG/KG)

ANALYTE	RDL		
TOTAL PETROLEUM HYDROCARBONS	12.5	55	120
% SOLIDS:		80.0	96.0

TPHS02 SB11B1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:	11MW3SB1820
LABORATORY ID:	D4063212

INORGANIC SOILS (MG/KG)

ANALYTE	RDL	
TOTAL PETROLEUM HYDROCARBONS	12.5	130
% SOLIDS:		55.0

TPHS01 11B2

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		5B1SB0406	5B1SB0810	5B2SB0406	5B2SB0608	11MW1SB1012
LABORATORY ID:		D4063201	D4063202	D4063203	D4063204	D4063205
INORGANIC SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12.5	330	1300	44	180	59
% SOLIDS:		76.0	93.0	93.0	87.0	83.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		11MW1SB1214	11MW1SB1820	11MW2SB0406	11B1SB1214	11MW3SB1214
LABORATORY ID:		D4063206	D4063207	D4063208	D4063210	D4063211
INORGANIC SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12 5	340	54	72	48	3600
% SOLIDS:		81.0	76.0	94.0	78.0	84.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:			11MW1SB1012		11MW1SB1820		11MW2SB0406		11B1SB1012		11B1SB1214	
LABORATORY ID:			B4031601		B4031602		B4031603		B4031604		B4031605	
TCL VOLATILE SOILS (UG/KG)												
ANALYTE	CRQL	MDL										
ACETONE	10	9	18	U	38	U	39	U	26	U	48	U
BENZENE	5	1	6	U	6	U	5	U	6	U	8	U
BROMODICHLOROMETHANE	5	1	6	U	6	U	5	U	6	U	8	U
BROMOFORM	5	1	6	U	6	U	5	U	6	U	8	U
BROMOMETHANE	10	1	11	U	12	U	10	U	12	U	16	U
2-BUTANONE	10	5	11	U	12	U	10	U	12	U	16	U
CARBON DISULFIDE	5	1	6	U	6	U	5	U	6	U	8	U
CARBON TETRACHLORIDE	5	3	6	U	6	U	5	U	6	U	8	U
CHLOROBENZENE	5	0.9	6	U	6	U	5	U	6	U	8	U
CHLOROETHANE	10	2	11	U	12	U	10	U	12	U	16	U
CHLOROFORM	5	1	6	U	6	U	5	U	6	U	8	U
CHLOROMETHANE	10	1	11	U	12	U	10	U	12	U	16	U
DIBROMOCHLOROMETHANE	5	1	6	U	6	U	5	U	6	U	8	U
1,1-DICHLOROETHANE	5	2	6	U	6	U	5	U	6	U	8	U
1,2-DICHLOROETHANE	5	2	6	U	6	U	5	U	6	U	8	U
1,1-DICHLOROETHENE	5	2	6	U	6	U	5	U	6	U	8	U
1,2-DICHLOROETHENE (TOTAL)	5	2	6	U	6	U	5	U	6	U	8	U
1,2-DICHLOROPROPANE	5	1	6	U	6	U	5	U	6	U	8	U
CIS-1,3-DICHLOROPROPENE	5	1	6	U	6	U	5	U	6	U	8	U
TRANS-1,3-DICHLOROPROPENE	5	2	6	U	6	U	5	U	6	U	8	U
ETHYLBENZENE	5	1	6	U	6	U	5	U	6	U	8	U
2-HEXANONE	10	4	11	U	12	U	10	U	12	U	16	U
METHYLENE CHLORIDE	5	8	9	U	21	U	10	U	12	U	19	U
4-METHYL-2-PENTANONE	10	5	11	U	12	U	10	U	12	U	16	U
STYRENE	5	1	6	U	6	U	5	U	6	U	8	U
1,1,2,2-TETRACHLOROETHANE	5	2	6	U	6	U	5	U	6	U	8	U
TETRACHLOROETHENE	5	2	6	U	6	U	5	U	6	U	8	U
TOLUENE	5	1	6	U	6	U	5	U	2	J	8	U
1,1,1-TRICHLOROETHANE	5	2	6	U	6	U	5	U	6	U	8	U
1,1,2-TRICHLOROETHANE	5	1	6	U	6	U	5	U	6	U	8	U
TRICHLOROETHENE	5	2	6	U	6	U	5	U	6	U	8	U
VINYL ACETATE	10	3	11	U	12	U	10	U	12	U	16	U
VINYL CHLORIDE	10	2	11	U	12	U	10	U	12	U	16	U
TOTAL XYLENES	5	0.5	6	U	6	U	5	U	6	U	8	U
% SOLIDS:			90.0		80.0		98.0		81.0		61.0	
DILUTION FACTOR:			1.0		1.0		1.0		1.0		1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:			11B2SB1012		11B2SB1820	
LABORATORY ID:			B4031915		B4031916	

TCL VOLATILE SOILS (UG/KG)

ANALYTE	CRQL	MDL				
ACETONE	10	9	24	U	150	U
BENZENE	5	1	5	U	6	U
BROMODICHLOROMETHANE	5	1	5	U	6	U
BROMOFORM	5	1	5	U	6	U
BROMOMETHANE	10	1	11	U	12	U
2-BUTANONE	10	5	11	U	12	U
CARBON DISULFIDE	5	1	5	U	6	U
CARBON TETRACHLORIDE	5	3	5	U	6	U
CHLOROBENZENE	5	0.9	5	U	6	U
CHLOROETHANE	10	2	11	U	12	U
CHLOROFORM	5	1	5	U	6	U
CHLOROMETHANE	10	1	11	U	12	U
DIBROMOCHLOROMETHANE	5	1	5	U	6	U
1,1-DICHLOROETHANE	5	2	5	U	6	U
1,2-DICHLOROETHANE	5	2	5	U	6	U
1,1-DICHLOROETHENE	5	2	5	U	6	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	U	6	U
1,2-DICHLOROPROPANE	5	1	5	U	6	U
CIS-1,3-DICHLOROPROPENE	5	1	5	U	6	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	U	6	U
ETHYLBENZENE	5	1	5	U	6	U
2-HEXANONE	10	4	11	U	12	U
METHYLENE CHLORIDE	5	8	28	U	24	U
4-METHYL-2-PENTANONE	10	5	11	U	12	U
STYRENE	5	1	5	U	6	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	U	6	U
TETRACHLOROETHENE	5	2	5	U	6	U
TOLUENE	5	1	1	J	3	J
1,1,1-TRICHLOROETHANE	5	2	5	U	6	U
1,1,2-TRICHLOROETHANE	5	1	5	U	6	U
TRICHLOROETHENE	5	2	5	U	6	U
VINYL ACETATE	10	3	11	U	12	U
VINYL CHLORIDE	10	2	11	U	12	U
TOTAL XYLENES	5	0.5	5	U	21	
% SOLIDS:			95.0		82.0	
DILUTION FACTOR:			1.0		1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID: 11MW3SB1820
LABORATORY ID: B4031607

TCL VOLATILE SOILS (UG/KG)

ANALYTE	CRQL	MDL		
ACETONE	10	9	35	U
BENZENE	5	1	6	U
BROMODICHLOROMETHANE	5	1	6	U
BROMOFORM	5	1	6	U
BROMOMETHANE	10	1	13	U
2-BUTANONE	10	5	13	U
CARBON DISULFIDE	5	1	6	U
CARBON TETRACHLORIDE	5	3	6	U
CHLOROBENZENE	5	0.9	6	U
CHLOROETHANE	10	2	13	U
CHLOROFORM	5	1	6	U
CHLOROMETHANE	10	1	13	U
DIBROMOCHLOROMETHANE	5	1	6	U
1,1-DICHLOROETHANE	5	2	6	U
1,2-DICHLOROETHANE	5	2	6	U
1,1-DICHLOROETHENE	5	2	6	U
1,2-DICHLOROETHENE (TOTAL)	5	2	6	U
1,2-DICHLOROPROPANE	5	1	6	U
CIS-1,3-DICHLOROPROPENE	5	1	6	U
TRANS-1,3-DICHLOROPROPENE	5	2	6	U
ETHYLBENZENE	5	1	6	U
2-HEXANONE	10	4	13	U
METHYLENE CHLORIDE	5	8	16	U
4-METHYL-2-PENTANONE	10	5	13	U
STYRENE	5	1	6	U
1,1,2,2-TETRACHLOROETHANE	5	2	6	U
TETRACHLOROETHENE	5	2	6	U
TOLUENE	5	1	6	U
1,1,1-TRICHLOROETHANE	5	2	6	U
1,1,2-TRICHLOROETHANE	5	1	6	U
TRICHLOROETHENE	5	2	6	U
VINYL ACETATE	10	3	13	U
VINYL CHLORIDE	10	2	13	U
TOTAL XYLENES	5	0.5	11	

% SOLIDS: 78.0
DILUTION FACTOR: 1.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID: 11MW3SB1214
LABORATORY ID: B4031606

TCL VOLATILE SOILS (UG/KG)

ANALYTE	CRQL	MDL		
ACETONE	1250	9	5800	U
BENZENE	625	1	2900	U
BROMODICHLOROMETHANE	625	1	2900	U
BROMOFORM	625	1	2900	U
BROMOMETHANE	1250	1	5800	U
2-BUTANONE	1250	5	5800	U
CARBON DISULFIDE	625	1	2900	U
CARBON TETRACHLORIDE	625	3	2900	U
CHLOROBENZENE	625	0.9	2900	U
CHLOROETHANE	1250	2	5800	U
CHLOROFORM	625	1	2900	U
CHLOROMETHANE	1250	1	5800	U
DIBROMOCHLOROMETHANE	625	1	2900	U
1,1-DICHLOROETHANE	625	2	2900	U
1,2-DICHLOROETHANE	625	2	2900	U
1,1-DICHLOROETHENE	625	2	2900	U
1,2-DICHLOROETHENE (TOTAL)	625	2	2900	U
1,2-DICHLOROPROPANE	625	1	2900	U
CIS-1,3-DICHLOROPROPENE	625	1	2900	U
TRANS-1,3-DICHLOROPROPENE	625	2	2900	U
ETHYLBENZENE	625	1	910	J
2-HEXANONE	1250	4	5800	U
METHYLENE CHLORIDE	625	8	5400	U
4-METHYL-2-PENTANONE	1250	5	5800	U
STYRENE	625	1	2900	U
1,1,2,2-TETRACHLOROETHANE	625	2	2900	U
TETRACHLOROETHENE	625	2	2900	U
TOLUENE	625	1	2900	U
1,1,1-TRICHLOROETHANE	625	2	2900	U
1,1,2-TRICHLOROETHANE	625	1	2900	U
TRICHLOROETHENE	625	2	2900	U
VINYL ACETATE	1250	3	5800	U
VINYL CHLORIDE	1250	2	5800	U
TOTAL XYLENES	625	0.5	14000	J

% SOLIDS: 86.0
DILUTION FACTOR: 4.0

UST AREA B

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		56MW1SB0608	58B2SB0204	58B1SB0406	58B1SB1214
LABORATORY ID:		B4031406	B4031408	B4031212	B4031213
INORGANIC SOILS (MG/KG)					
ANALYTE	RDL				
TOTAL PETROLEUM HYDROCARBONS	12.5	63	29	760 J	24 J
% SOLIDS:		75.0	84.0	87.0	87.0

TPHS01 SDG 10MW1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		58B2SB1012	58MW1SB0204	58MW1SB1820	56B1SB0810	56B1SB1820
LABORATORY ID:		B4031401	B4031402	B4031403	B4031404	B4031405
INORGANIC SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12.5	28	12.5 U	13	91	12.5 U
% SOLIDS:		88.0	89.0	86.0	56.0	81.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		56B2SB0608		56MW1SBDUP5	56B2SB1214	
LABORATORY ID:		B4031509		B4031418	B4031510	
INORGANIC SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12.5	12.5	U	13	12.5	U
% SOLIDS:		83.0		88.0	82.0	

UST AREA D1

TPH S01 SDG 46MW1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		46MW1SB0406	46MW1SB1214	46MW1SBDUP1	46MW2SB0406	46MW2SB1618
LABORATORY ID:		B4031101	B4031102	B4031103	B4031104	B4031105
INORGANIC SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12.5	1500	650	210	240	78
% SOLIDS:		84.0	85.0	86.0	82.0	91.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		47MW1SB0810	47MW1SB1820	47B2SB0608
LABORATORY ID:		B4031108	B4031109	B4031110
INORGANIC SOILS (MG/KG)				
ANALYTE	RDL			
TOTAL PETROLEUM HYDROCARBONS	12.5	54	87	94
% SOLIDS:		87.0	90.0	83.0

TPH S02 SDG 46MW1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		47B2SB1214	47B1SB0608	47MW1SBDUP2
LABORATORY ID:		B4031111	B4031112	B4031113
INORGANIC SOILS (MG/KG)				
ANALYTE	RDL			
TOTAL PETROLEUM HYDROCARBONS	12.5	110	110	170
% SOLIDS:		78.0	79.0	82.0

TPH S03 SD6 46MW1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		48MW1SB0406	48MW1SB1820	47B1SB0406	47B1SB1820	62MW1SB0204
LABORATORY ID:		B4031306	B4031307	B4031308	B4031309	B4031310
INORGANIC SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12.5	520	180	240	190	110
% SOLIDS:		71.0	85.0	85.0	87.0	82.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		62MW1SB1820	48MW2SB0608	48MW2SB1820	62B1SB0608
LABORATORY ID:		B4031311	B4031312	B4031313	B4031314
INORGANIC SOILS (MG/KG)					
ANALYTE	RDL				
TOTAL PETROLEUM HYDROCARBONS	12.5	270	760	160	330
% SOLIDS:		90.0	82.0	89.0	82.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		62B1SB1214	63MW1SB0810	63MW1SB0608	62B2SB1820	62B2SB0608
LABORATORY ID:		B4031201	B4031202	B4031203	B4031204	B4031205
INORGANIC SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12.5	380 J	430 J	570 J	86 J	5300 J
% SOLIDS:		82.0	81.0	87.0	86.0	90.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		71MW1SB0810	71MW1SB1416	65B1SB0204	65B1SB1012	65B2SB0810
LABORATORY ID:		B4031206	B4031207	B4031208	B4031209	B4031210
INORGANIC SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12 5	57 J	16 J	73 J	39 J	120 J
% SOLIDS:		82.0	88.0	87.0	95.0	90.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		64B1SB0204	64B1SB1012	64B2SB0204	64B2SB1012
LABORATORY ID:		B4031907	B4031908	B4031909	B4031910
INORGANIC SOILS (MG/KG)					
ANALYTE	RDL				
TOTAL PETROLEUM HYDROCARBONS	12.5	47	89	39	55
% SOLIDS:		79.0	83.0	88.0	80.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		65B2SB1012	65MW1SB1012	65MW1SB1214	65B2SB0406	65B2SBDUP3
LABORATORY ID:		B4031211	B4031214	B4031215	B4031216	B4031217
INORGANIC SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12 5	310 J	12.5 UR	16 J	31 J	110 J
% SOLIDS:		88.0	88.0	89.0	92.0	90.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:			63MW1SB0810		63MW1SB0608		71MW1SB0810		71MW1SB1416	
LABORATORY ID:			B4031202		B4031203		B4031206		B4031207	

TCL VOLATILE SOILS (UG/KG)

ANALYTE	CRQL	MDL								
ACETONE	10	9	40	U	68	U	91	U	29	U
BENZENE	5	1	6	U	6	U	6	U	5	U
BROMODICHLOROMETHANE	5	1	6	U	6	U	6	U	5	U
BROMOFORM	5	1	6	U	6	U	6	U	5	U
BROMOMETHANE	10	1	12	U	11	U	12	U	11	U
2-BUTANONE	10	5	22	U	11	U	12	U	11	U
CARBON DISULFIDE	5	1	6	U	6	U	6	U	5	U
CARBON TETRACHLORIDE	5	3	6	U	6	U	6	U	5	U
CHLOROBENZENE	5	0 9	6	U	6	U	6	U	5	U
CHLOROETHANE	10	2	12	U	11	U	12	U	11	U
CHLOROFORM	5	1	6	U	6	U	6	U	5	U
CHLOROMETHANE	10	1	12	U	11	U	12	U	11	U
DIBROMOCHLOROMETHANE	5	1	6	U	6	U	6	U	5	U
1,1-DICHLOROETHANE	5	2	6	U	6	U	6	U	5	U
1,2-DICHLOROETHANE	5	2	6	U	6	U	6	U	5	U
1,1-DICHLOROETHENE	5	2	6	U	6	U	6	U	5	U
1,2-DICHLOROETHENE (TOTAL)	5	2	6	U	6	U	6	U	5	U
1,2-DICHLOROPROPANE	5	1	6	U	6	U	6	U	5	U
CIS-1,3-DICHLOROPROPENE	5	1	6	U	6	U	6	U	5	U
TRANS-1,3-DICHLOROPROPENE	5	2	6	U	6	U	6	U	5	U
ETHYLBENZENE	5	1	6	U	6	U	6	U	5	U
2-HEXANONE	10	4	12	U	11	U	12	U	11	U
METHYLENE CHLORIDE	5	8	13	U	9	U	17	U	11	U
4-METHYL-2-PENTANONE	11	5	12	U	11	U	12	U	11	U
STYRENE	5	1	6	U	6	U	6	U	5	U
1,1,2,2-TETRACHLOROETHANE	5	2	6	U	6	U	6	U	5	U
TETRACHLOROETHENE	5	2	6	U	6	U	6	U	5	U
TOLUENE	5	1	6	U	6	U	6	U	5	U
1,1,1-TRICHLOROETHANE	5	2	6	U	6	U	6	U	5	U
1,1,2-TRICHLOROETHANE	5	1	6	U	6	U	6	U	5	U
TRICHLOROETHENE	5	2	6	U	6	U	6	U	5	U
VINYL ACETATE	11	3	12	U	11	U	12	U	11	U
VINYL CHLORIDE	10	2	12	U	11	U	12	U	11	U
TOTAL XYLENES	5	0 5	6	U	6	U	6	U	5	U
% SOLIDS:			86.0		88.0		84.0		92.0	
DILUTION FACTOR:			1.0		1.0		1.0		1.0	

UST AREA D2

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		10MW2SB1012	10MW2SB0608	10MW1SB0406	10MW1SB0608
LABORATORY ID:		B4031506	B4031505	B4031415	B4031416
INORGANIC SOILS (MG/KG)					
ANALYTE	RDL				
TOTAL PETROLEUM HYDROCARBONS	12.5	130	17	160	65
% SOLIDS:		84.0	83.0	87.0	85.0

UST AREA E

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		68B1SB0406		68B1SB1012		68MW1SB0204
LABORATORY ID:		B4031409		B4031410		B4031411
INORGANIC SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12.5	12.5	U	12.5	U	65
% SOLIDS:		82.0		83.0		88.0

TPHS02 SDG 10MW1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		68MW1SB0810		68B2SB0204	68B2SB0810		68B2SBDUP4
LABORATORY ID:		B4031412		B4031413	B4031414		B4031417
INORGANIC SOILS (MG/KG)							
ANALYTE	RDL						
TOTAL PETROLEUM HYDROCARBONS	12.5	12.5	U	30	12.5	U	18
% SOLIDS:		83.0		80.0	76.0		78.0

UST AREA F1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		66B1SB0204	66B1SB1214	66MW1SB0204	66MW1SB1820	26B1SB0608
LABORATORY ID:		B4031701	B4031702	B4031704	B4031705	B4031706
WET CHEMISTRY SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12.5	1300 J	56 J	780 J	12.5 U	12.5 U
% SOLIDS:		95.0	96.0	94.0	93.0	96.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		26B1SB0810	25B1SB0608	25B1SBDUP7	25B1SB1012	26MW1SB0204
LABORATORY ID:		B4031707	B4031708	B4031709	B4031710	B4031711
WET CHEMISTRY SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12 5	13 J	120 J	300 J	16 J	15 J
% SOLIDS:		87.0	94.0	94.0	90.0	93.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		26MW1SB1820
LABORATORY ID:		B4031712

WET CHEMISTRY SOILS (MG/KG)

ANALYTE	RDL		
TOTAL PETROLEUM HYDROCARBONS	12.5	22	J
% SOLIDS:		95.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		26MW3SB0406	26MW3SB1820
LABORATORY ID:		B4032012	B4032013

WET CHEMISTRY SOILS (MG/KG)

ANALYTE	RDL		
TOTAL PETROLEUM HYDROCARBONS	12 5	360 J	27 J
% SOLIDS:		94.0	91.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		26B2SB0608	26B2SB0810	25MW1SB2628	25MW1SB2830	26MW2SB0810
LABORATORY ID.		B4032001	B4032002	B4032003	B4032004	B4032005
WET CHEMISTRY SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12 5	25 J	23 J	14 J	30 J	42 J
% SOLIDS:		84.0	77.0	80.0	71.0	82.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		26MW2SB1820	25B3SB1012	25B2SB0406	25B2SB1012	25B2SBDUP8
LABORATORY ID:		B4032006	B4032008	B4032009	B4032010	B4032011
WET CHEMISTRY SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12 5	27 J	49 J	30 J	24 J	65 J
% SOLIDS:		91.0	90 0	92.0	88.0	93 0

TPHS02 SDG 3B2

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		38B1SB0608	38B1SB1012	38B2SB0608	38B2SB1012
LABORATORY ID:		B4031911	B4031912	B4031913	B4031914
INORGANIC SOILS (MG/KG)					
ANALYTE	RDL				
TOTAL PETROLEUM HYDROCARBONS	12.5	1800	440	70	53
% SOLIDS:		94.0	80.0	77.0	77.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:			25B1SB0608		25B1SBDUP7		25B1SB1012		26MW1SB0204		26MW1SB1820	
LABORATORY ID:			B4031708RI		B4031709		B4031710		B4031711		B4031712	
TCL VOLATILE SOILS (UG/KG)												
ANALYTE	CRQL	MDL										
ACETONE	10	9	21	U	11	U	17	U	200	U	17	U
BENZENE	5	1	5	UJ	5	UJ	6	U	5	U	5	U
BROMODICHLOROMETHANE	5	1	5	U	5	UJ	6	U	5	U	5	U
BROMOFORM	5	1	5	UJ	5	UJ	6	U	5	U	5	U
BROMOMETHANE	10	1	11	UJ	11	UJ	11	U	11	U	11	U
2-BUTANONE	10	5	11	UJ	11	UJ	11	U	11	U	11	U
CARBON DISULFIDE	5	1	5	UJ	5	UJ	6	U	5	U	5	U
CARBON TETRACHLORIDE	5	3	5	U	5	UJ	6	U	5	U	5	U
CHLOROBENZENE	5	0.9	5	UJ	5	UJ	6	U	5	U	5	U
CHLOROETHANE	10	2	11	UJ	11	UJ	11	U	11	U	11	U
CHLOROFORM	5	1	5	UJ	5	UJ	6	U	5	U	5	U
CHLOROMETHANE	10	1	11	UJ	11	UJ	11	U	11	U	11	U
DIBROMOCHLOROMETHANE	5	1	5	U	5	UJ	6	U	5	U	5	U
1,1-DICHLOROETHANE	5	2	5	UJ	5	UJ	6	U	5	U	5	U
1,2-DICHLOROETHANE	5	2	5	UJ	5	UJ	6	U	5	U	5	U
1,1-DICHLOROETHENE	5	2	5	UJ	5	UJ	6	U	5	U	5	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	UJ	5	UJ	6	U	5	U	5	U
1,2-DICHLOROPROPANE	5	1	5	U	5	UJ	6	U	5	U	5	U
CIS-1,3-DICHLOROPROPENE	5	1	5	U	5	UJ	6	U	5	U	5	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	U	5	UJ	6	U	5	U	5	U
ETHYLBENZENE	5	1	5	UJ	5	UJ	6	U	5	U	5	U
2-HEXANONE	10	4	11	UJ	11	UJ	11	U	11	U	11	U
METHYLENE CHLORIDE	5	8	11	U	5	U	12	U	29	U	6	U
4-METHYL-2-PENTANONE	10	5	11	UJ	11	UJ	11	U	11	U	11	U
STYRENE	5	1	5	UJ	5	UJ	6	U	5	U	5	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	UJ	5	UJ	6	U	5	U	5	U
TETRACHLOROETHENE	5	2	5	UJ	5	UJ	6	U	5	U	5	U
TOLUENE	5	1	5	UJ	5	UJ	6	U	5	U	5	U
1,1,1-TRICHLOROETHANE	5	2	5	U	5	UJ	6	U	5	U	5	U
1,1,2-TRICHLOROETHANE	5	1	5	U	5	UJ	6	U	5	U	5	U
TRICHLOROETHENE	5	2	5	U	5	UJ	6	U	5	U	5	U
VINYL ACETATE	10	3	11	U	11	UJ	11	U	11	U	1	J
VINYL CHLORIDE	10	2	11	UJ	11	UJ	11	U	11	U	11	U
TOTAL XYLENES	5	0 5	5	U	5	UJ	6	U	5	U	5	U
% SOLIDS:			93.0		95.0		88.0		92.0		94.0	
DILUTION FACTOR:			1.0		1.0		1.0		1.0		1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID: 26B1SB0810
LABORATORY ID: B4031707

TCL VOLATILE SOILS (UG/KG)

ANALYTE	CRQL	MDL		
ACETONE	10	9	14	U
BENZENE	5	1	6	UJ
BROMODICHLOROMETHANE	5	1	6	UJ
BROMOFORM	5	1	6	UJ
BROMOMETHANE	10	1	11	U
2-BUTANONE	10	5	11	U
CARBON DISULFIDE	5	1	6	U
CARBON TETRACHLORIDE	5	3	6	UJ
CHLOROBENZENE	5	0.9	6	UJ
CHLOROETHANE	10	2	11	U
CHLOROFORM	5	1	6	U
CHLOROMETHANE	10	1	11	U
DIBROMOCHLOROMETHANE	5	1	6	UJ
1,1-DICHLOROETHANE	5	2	6	U
1,2-DICHLOROETHANE	5	2	6	U
1,1-DICHLOROETHENE	5	2	6	U
1,2-DICHLOROETHENE (TOTAL)	5	2	6	U
1,2-DICHLOROPROPANE	5	1	6	UJ
CIS-1,3-DICHLOROPROPENE	5	1	6	UJ
TRANS-1,3-DICHLOROPROPENE	5	2	6	UJ
ETHYLBENZENE	5	1	6	UJ
2-HEXANONE	10	4	11	UJ
METHYLENE CHLORIDE	5	8	6	U
4-METHYL-2-PENTANONE	10	5	11	UJ
STYRENE	5	1	6	UJ
1,1,2,2-TETRACHLOROETHANE	5	2	6	UJ
TETRACHLOROETHENE	5	2	6	UJ
TOLUENE	5	1	6	UJ
1,1,1-TRICHLOROETHANE	5	2	6	UJ
1,1,2-TRICHLOROETHANE	5	1	6	UJ
TRICHLOROETHENE	5	2	6	UJ
VINYL ACETATE	10	3	11	U
VINYL CHLORIDE	10	2	11	U
TOTAL XYLENES	5	0.5	6	UJ

% SOLIDS: 87.0
DILUTION FACTOR: 1.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

TCL VOLATILE SOILS (UG/KG)

CLIENT ID:			66B1SB0204		66B1SB1214		66MW1SB0204		66MW1SB1820		26B1SB0608	
LABORATORY ID:			B4031701		B4031702		B4031704		B4031705		B4031706	
ANALYTE	CRQL	MDL										
ACETONE	10	9	23	U	20	U	30	U	41	U	10	U
BENZENE	5	1	5	UJ	5	U	5	UJ	7	U	5	U
BROMODICHLOROMETHANE	5	1	5	UJ	5	U	5	UJ	7	U	5	U
BROMOFORM	5	1	5	UJ	5	U	5	UJ	7	U	5	U
BROMOMETHANE	10	1	11	UJ	10	U	11	UJ	14	U	10	U
2-BUTANONE	10	5	5	J	10	U	6	J	14	U	10	U
CARBON DISULFIDE	5	1	5	UJ	5	U	5	UJ	7	U	5	U
CARBON TETRACHLORIDE	5	3	5	UJ	5	U	5	UJ	7	U	5	U
CHLOROBENZENE	5	0.9	5	UJ	5	U	5	UJ	7	U	5	U
CHLOROETHANE	10	2	11	UJ	10	U	11	UJ	14	U	10	U
CHLOROFORM	5	1	5	UJ	5	U	5	UJ	7	U	5	U
CHLOROMETHANE	10	1	11	UJ	10	U	11	UJ	14	U	10	U
DIBROMOCHLOROMETHANE	5	1	5	UJ	5	U	5	UJ	7	U	5	U
1,1-DICHLOROETHANE	5	2	5	UJ	5	U	5	UJ	7	U	5	U
1,2-DICHLOROETHANE	5	2	5	UJ	5	U	5	UJ	7	U	5	U
1,1-DICHLOROETHENE	5	2	5	UJ	5	U	5	UJ	7	U	5	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	UJ	5	U	5	UJ	7	U	5	U
1,2-DICHLOROPROPANE	5	1	5	UJ	5	U	5	UJ	7	U	5	U
CIS-1,3-DICHLOROPROPENE	5	1	5	UJ	5	U	5	UJ	7	U	5	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	UJ	5	U	5	UJ	7	U	5	U
ETHYLBENZENE	5	1	5	UJ	5	U	5	UJ	7	U	5	U
2-HEXANONE	10	4	11	UJ	10	U	11	UJ	14	U	10	U
METHYLENE CHLORIDE	5	8	16	U	13	U	12	U	10	U	5	U
4-METHYL-2-PENTANONE	10	5	11	UJ	10	U	11	UJ	14	U	10	U
STYRENE	5	1	5	UJ	5	U	5	UJ	7	U	5	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	UJ	5	U	5	UJ	7	U	5	U
TETRACHLOROETHENE	5	2	5	UJ	5	U	5	UJ	7	U	5	U
TOLUENE	5	1	5	UJ	5	U	5	UJ	7	U	5	U
1,1,1-TRICHLOROETHANE	5	2	5	UJ	5	U	5	UJ	7	U	5	U
1,1,2-TRICHLOROETHANE	5	1	5	UJ	5	U	5	UJ	7	U	5	U
TRICHLOROETHENE	5	2	5	UJ	5	U	5	UJ	7	U	5	U
VINYL ACETATE	10	3	11	UJ	10	U	11	UJ	14	U	10	U
VINYL CHLORIDE	10	2	11	UJ	10	U	11	UJ	14	U	10	U
TOTAL XYLENES	5	0.5	5	UJ	5	U	5	UJ	7	U	5	U
% SOLIDS:			94.0		96.0		94.0		69.0		96.0	
DILUTION FACTOR:			1.0		1.0		1.0		1.0		1.0	

APPENDIX E-2

SOIL SAMPLES FROM TEST PIT EXCAVATION

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID.		DV9TP0806S	DV9TP0802NE	DV8TP1200B	DV8TP0806SE	DV8TP1205B
LABORATORY ID.		B4035901	B4035902	B4035903	B4035904	B4035905
WET CHEMISTRY SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12 5	12 5 U	55	380	140	12.5 U
% SOLIDS:		89.0	80.0	94.0	94.0	93.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID.		DV8TPDUPL2	DV8TP0808NW
LABORATORY ID:		B4035906	B4035907
WET CHEMISTRY SOILS (MG/KG)			
ANALYTE	RDL		
TOTAL PETROLEUM HYDROCARBONS	12.5	12.5 U	12.5 U
% SOLIDS:		93.0	92.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		DV69TP0607W	DV69TP0708S	DV69TP1011B	DV69TP1012SE	DV69TP1112E
LABORATORY ID:		D4099301	D4099302	D4099303	D4099304	D4099305
WET CHEMISTRY SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12 5	12.5 U	12.5 U	12.5 U	2200	12 5 U
% SOLIDS:		97.0	97.0	96.0	97.0	95.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		DV70TP0910S	DV70TP1011SE	DV70TP0809NW	DV70TP1112NW	DV70TP1112NE
LABORATORY ID:		D4099306	D4099307	D4099308	D4099309	D4099310
WET CHEMISTRY SOILS (MG/KG)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	12.5	12.5 U	15	35	12.5 U	12.5 U
% SOLIDS:		98.0	97.0	97.0	98.0	98.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		DVTPDUPL1
LABORATORY ID:		D4099311
WET CHEMISTRY SOILS (MG/KG)		
ANALYTE	RDL	
TOTAL PETROLEUM HYDROCARBONS	12.5	12.5 U
% SOLIDS:		98.0

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:			DV9TP0806S		DV9TP0802NE	
LABORATORY ID:			B4035901		B4035902	

TCL VOLATILE SOILS (UG/KG)

ANALYTE	CRQL	MDL				
ACETONE	12	9	29	U	28	U
BENZENE	6	1	6	U	6	U
BROMODICHLOROMETHANE	6	1	6	U	6	U
BROMOFORM	6	1	6	U	6	U
BROMOMETHANE	12	1	12	U	12	U
2-BUTANONE	12	5	12	U	12	U
CARBON DISULFIDE	6	1	6	U	6	U
CARBON TETRACHLORIDE	6	3	6	U	6	U
CHLOROBENZENE	6	0.9	6	U	6	U
CHLOROETHANE	12	2	12	U	12	U
CHLOROFORM	6	1	6	U	6	U
CHLOROMETHANE	12	1	12	U	12	U
DIBROMOCHLOROMETHANE	6	1	6	U	6	U
1,1-DICHLOROETHANE	6	2	6	U	6	U
1,2-DICHLOROETHANE	6	2	6	U	6	U
1,1-DICHLOROETHENE	6	2	6	U	6	U
1,2-DICHLOROETHENE (TOTAL)	6	2	6	U	6	U
1,2-DICHLOROPROPANE	6	1	6	U	6	U
CIS-1,3-DICHLOROPROPENE	6	1	6	U	6	U
TRANS-1,3-DICHLOROPROPENE	6	2	6	U	6	U
ETHYLBENZENE	5	1	6	U	6	U
2-HEXANONE	12	4	12	U	12	U
METHYLENE CHLORIDE	6	8	16	U	24	U
4-METHYL-2-PENTANONE	12	5	12	U	12	U
STYRENE	6	1	6	U	6	U
1,1,2,2-TETRACHLOROETHANE	6	2	6	U	6	U
TETRACHLOROETHENE	6	2	6	U	6	U
TOLUENE	6	1	6	U	6	U
1,1,1-TRICHLOROETHANE	6	2	6	U	6	U
1,1,2-TRICHLOROETHANE	6	1	6	U	6	U
TRICHLOROETHENE	6	2	6	U	6	U
VINYL ACETATE	12	3	12	U	12	U
VINYL CHLORIDE	12	2	12	U	12	U
TOTAL XYLENES	6	0.5	6	U	6	U
% SOLIDS:			84.0		80.0	
DILUTION FACTOR:			1.0		1.0	

APPENDIX E-3

GROUNDWATER SAMPLES

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID.		11MW2GW01	11MW3GW01	11MW1GW01	GWDUPL201	6MW1GW01
LABORATORY ID:		B4034102	B4034103	B4034104	B4034105	B4034106
WET CHEMISTRY WATERS (MG/L)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	0.25	0.25 U	3.8	2.3	2.4	0.25 U

10mw2 TPHAQ1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		46MW1GW01	46MW2GW01	47MW1GW01	63MW1GW01	48MW1GW01
LABORATORY ID:		B4034001	B4034002	B4034003	B4034004	B4034005
WET CHEMISTRY WATERS (MG/L)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	0.25	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		48MW2GW01		62MW1GW01	71MW1GW01		DVRBGW01		25MW1GW01	
LABORATORY ID:		B4034006		B4034007	B4034008		B4034009		B4034011	
WET CHEMISTRY WATERS (MG/L)										
ANALYTE	RDL									
TOTAL PETROLEUM HYDROCARBONS	0 25	0.25	U	0.34	0.25	U	0.25	U	0.25	U

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		65MW1GW01		10MW1GW01	10MW2GW01
LABORATORY ID:		B4034017		B4034018	B4034019
WET CHEMISTRY WATERS (MG/L)					
ANALYTE	RDL				
TOTAL PETROLEUM HYDROCARBONS	0.25	0.25	U	0.45	5.1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID.		3MW1GW01		56MW1GW01		68MW1GW01		58MW1GW01	
LABORATORY ID.		B4034107		B4034108		B4034109		B4034110	
WET CHEMISTRY WATERS (MG/L)									
ANALYTE	RDL								
TOTAL PETROLEUM HYDROCARBONS	0 25	0 25	U	0.25	U	0.25	U	0.25	U

10MW2 TPHAQ2

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		26MW2GW01	GWDUPL101	26MW3GW01	66MW1GW01	26MW1GW01
LABORATORY ID:		B4034012	B4034013	B4034014	B4034015	B4034016
WET CHEMISTRY WATERS (MG/L)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	0.25	0.25 U	0.25 U	0.25 U	0.25 U	0.33

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

TCL VOLATILE WATERS (UG/L)

CLIENT ID:			DVTB2GW01		11MW2GW01		11MW3GW01		11MW1GW01		GWDUPL201	
LABORATORY ID:			B4034101		B4034102		B4034103		B4034104		B4034105	
ANALYTE	CRQL	MDL										
ACETONE	10	9	10	U	10	U	80	U	300	U	1000	U
BENZENE	5	1	5	U	5	U	40	U	120	U	120	U
BROMODICHLOROMETHANE	5	1	5	U	5	U	40	U	120	U	120	U
BROMOFORM	5	1	5	U	5	U	40	U	120	U	120	U
BROMOMETHANE	10	1	10	U	10	U	80	U	250	U	250	U
2-BUTANONE	10	5	10	U	10	U	80	U	250	U	250	U
CARBON DISULFIDE	5	1	5	U	5	U	40	U	120	U	120	U
CARBON TETRACHLORIDE	5	3	5	U	5	U	40	U	120	U	120	U
CHLOROBENZENE	5	0.9	5	U	5	U	40	U	120	U	120	U
CHLOROETHANE	10	2	10	U	10	U	80	U	250	U	250	U
CHLOROFORM	5	1	5	U	5	U	40	U	120	U	120	U
CHLOROMETHANE	10	1	10	U	10	U	80	U	250	U	250	U
DIBROMOCHLOROMETHANE	5	1	5	U	5	U	40	U	120	U	120	U
1,1-DICHLOROETHANE	5	2	5	U	5	U	40	U	120	U	120	U
1,2-DICHLOROETHANE	5	2	5	U	5	U	40	U	120	U	120	U
1,1-DICHLOROETHENE	5	2	5	U	5	U	40	U	120	U	120	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	U	5	U	40	U	120	U	120	U
1,2-DICHLOROPROPANE	5	1	5	U	5	U	40	U	120	U	120	U
CIS-1,3-DICHLOROPROPENE	5	1	5	U	5	U	40	U	120	U	120	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	U	5	U	40	U	120	U	120	U
ETHYLBENZENE	5	1	5	U	5	U	190		880		950	
2-HEXANONE	10	4	10	U	10	U	80	UJ	250	UJ	250	U
METHYLENE CHLORIDE	5	8	10	U	10	U	44	U	280	U	350	U
4-METHYL-2-PENTANONE	10	5	10	U	10	U	80	U	250	U	250	U
STYRENE	5	1	5	U	5	U	40	U	120	U	120	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	U	5	U	40	U	120	U	120	U
TETRACHLOROETHENE	5	2	5	U	5	U	40	U	120	U	120	U
TOLUENE	5	1	5	U	5	U	9	J	120	U	120	U
1,1,1-TRICHLOROETHANE	5	2	5	U	5	U	40	U	120	U	120	U
1,1,2-TRICHLOROETHANE	5	1	5	U	5	U	40	U	120	U	120	U
TRICHLOROETHENE	5	2	5	U	5	U	40	U	120	U	120	U
VINYL ACETATE	10	5	10	U	10	U	80	U	250	U	250	U
VINYL CHLORIDE	10	2	10	U	10	U	80	U	250	U	250	U
TOTAL XYLENES	5	0.5	5	U	5	U	1400		5800		5800	
DILUTION FACTOR:			1.0		1.0		8.0		25.0		25.0	

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CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID: 68MW1GW01
LABORATORY ID: B4034109

TCL VOLATILE WATERS (UG/L)

ANALYTE	CRQL	MDL		
ACETONE	10	9	10	U
BENZENE	5	1	5	U
BROMODICHLOROMETHANE	5	1	5	U
BROMOFORM	5	1	5	U
BROMOMETHANE	10	1	10	U
2-BUTANONE	10	5	10	U
CARBON DISULFIDE	5	1	5	U
CARBON TETRACHLORIDE	5	3	5	U
CHLOROBENZENE	5	0.9	5	U
CHLOROETHANE	10	2	10	U
CHLOROFORM	5	1	5	U
CHLOROMETHANE	10	1	10	U
DIBROMOCHLOROMETHANE	5	1	5	U
1,1-DICHLOROETHANE	5	2	5	U
1,2-DICHLOROETHANE	5	2	5	U
1,1-DICHLOROETHENE	5	2	5	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	U
1,2-DICHLOROPROPANE	5	1	5	U
CIS-1,3-DICHLOROPROPENE	5	1	5	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	U
ETHYLBENZENE	5	1	5	U
2-HEXANONE	10	4	10	U
METHYLENE CHLORIDE	5	8	10	U
4-METHYL-2-PENTANONE	10	5	10	U
STYRENE	5	1	5	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	U
TETRACHLOROETHENE	5	2	5	U
TOLUENE	5	1	5	U
1,1,1-TRICHLOROETHANE	5	2	5	U
1,1,2-TRICHLOROETHANE	5	1	5	U
TRICHLOROETHENE	5	2	5	U
VINYL ACETATE	10	5	10	U
VINYL CHLORIDE	10	2	10	U
TOTAL XYLENES	5	0.5	5	U
DILUTION FACTOR:			1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:			65MW1GW01		10MW1GW01		10MW2GW01	
LABORATORY ID:			B4034017		B4034018		B4034019	

TCL VOLATILE WATERS (UG/L)

ANALYTE	CRQL	MDL						
ACETONE	10	9	10	U	80	U	10	U
BENZENE	5	1	5	U	5	U	5	U
BROMODICHLOROMETHANE	5	1	5	U	5	U	5	U
BROMOFORM	5	1	5	U	5	U	5	U
BROMOMETHANE	10	1	10	U	10	U	10	U
2-BUTANONE	10	5	10	U	10	U	10	U
CARBON DISULFIDE	5	1	5	U	5	U	5	U
CARBON TETRACHLORIDE	5	3	5	U	5	U	5	U
CHLOROBENZENE	5	0.9	5	U	5	U	5	U
CHLOROETHANE	10	2	10	U	10	U	10	U
CHLOROFORM	5	1	5	U	5	U	5	U
CHLOROMETHANE	10	1	10	U	10	U	10	U
DIBROMOCHLOROMETHANE	5	1	5	U	5	U	5	U
1,1-DICHLOROETHANE	5	2	5	U	5	U	5	U
1,2-DICHLOROETHANE	5	2	5	U	5	U	5	U
1,1-DICHLOROETHENE	5	2	5	U	5	U	5	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	U	5	U	5	U
1,2-DICHLOROPROPANE	5	1	5	U	5	U	5	U
CIS-1,3-DICHLOROPROPENE	5	1	5	U	5	U	5	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	U	5	U	5	U
ETHYLBENZENE	5	1	5	U	5	U	5	U
2-HEXANONE	10	4	10	U	10	U	10	U
METHYLENE CHLORIDE	5	8	9	U	27	U	27	U
4-METHYL-2-PENTANONE	10	5	10	U	10	U	10	U
STYRENE	5	1	5	U	5	U	5	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	U	5	U	5	U
TETRACHLOROETHENE	5	2	5	U	5	U	5	U
TOLUENE	5	1	5	U	5	U	5	U
1,1,1-TRICHLOROETHANE	5	2	5	U	5	U	5	U
1,1,2-TRICHLOROETHANE	5	1	5	U	5	U	5	U
TRICHLOROETHENE	5	2	5	U	5	U	5	U
VINYL ACETATE	10	5	10	U	10	U	10	U
VINYL CHLORIDE	10	2	10	U	10	U	10	U
TOTAL XYLENES	5	0.5	5	U	5	U	5	U
DILUTION FACTOR:			1.0		1.0		1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

TCL VOLATILE WATERS (UG/L)

CLIENT ID:			26MW2GW01		GWDUPL101		26MW3GW01		66MW1GW01		26MW1GW01	
LABORATORY ID:			B4034012		B4034013		B4034014		B4034015		B4034016	
ANALYTE	CRQL	MDL										
ACETONE	10	9	10	U	10	U	10	U	10	U	10	U
BENZENE	5	1	5	U	5	U	5	U	5	U	5	U
BROMODICHLOROMETHANE	5	1	5	U	5	U	5	U	5	U	5	U
BROMOFORM	5	1	5	U	5	U	5	U	5	U	5	U
BROMOMETHANE	10	1	10	U	10	U	10	U	10	U	10	U
2-BUTANONE	10	5	10	U	10	U	10	U	10	U	10	U
CARBON DISULFIDE	5	1	5	U	5	U	5	U	5	U	5	U
CARBON TETRACHLORIDE	5	3	5	U	5	U	5	U	5	U	5	U
CHLOROBENZENE	5	0.9	5	U	5	U	5	U	5	U	5	U
CHLOROETHANE	10	2	10	U	10	U	10	U	10	U	10	U
CHLOROFORM	5	1	5	U	5	U	5	U	5	U	5	U
CHLOROMETHANE	10	1	10	U	10	U	10	U	10	U	10	U
DIBROMOCHLOROMETHANE	5	1	5	U	5	U	5	U	5	U	5	U
1,1-DICHLOROETHANE	5	2	5	U	5	U	5	U	5	U	5	U
1,2-DICHLOROETHANE	5	2	5	U	5	U	5	U	5	U	5	U
1,1-DICHLOROETHENE	5	2	5	U	5	U	5	U	5	U	5	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	U	5	U	5	U	5	U	5	U
1,2-DICHLOROPROPANE	5	1	5	U	5	U	5	U	5	U	5	U
CIS-1,3-DICHLOROPROPENE	5	1	5	U	5	U	5	U	5	U	5	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	U	5	U	5	U	5	U	5	U
ETHYLBENZENE	5	1	5	U	5	U	5	U	5	U	5	U
2-HEXANONE	10	4	10	U	10	U	10	UJ	10	U	10	U
METHYLENE CHLORIDE	5	8	12	U	13	U	8	U	9	U	8	U
4-METHYL-2-PENTANONE	10	5	10	U	10	U	10	U	10	U	10	U
STYRENE	5	1	5	U	5	U	5	U	5	U	5	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	U	5	U	1	J	5	U	1	J
TETRACHLOROETHENE	5	2	3	J	3	J	1	J	2	J	4	J
TOLUENE	5	1	5	U	5	U	5	U	5	U	5	U
1,1,1-TRICHLOROETHANE	5	2	5	U	5	U	5	U	5	U	5	U
1,1,2-TRICHLOROETHANE	5	1	5	U	5	U	5	U	5	U	5	U
TRICHLOROETHENE	5	2	3	J	3	J	1	J	5	U	3	J
VINYL ACETATE	10	5	10	U	10	U	10	U	10	U	10	U
VINYL CHLORIDE	10	2	10	U	10	U	10	U	10	U	10	U
TOTAL XYLENES	5	0.5	5	U	5	U	5	U	5	U	5	U
DILUTION FACTOR:			1.0		1.0		1.0		1.0		1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:			46MW1GW01		46MW2GW01		47MW1GW01		48MW1GW01		48MW2GW01	
LABORATORY ID:			B4034001		B4034002		B4034003		B4034005		B4034006	
TCL VOLATILE WATERS (UG/L)												
ANALYTE	CRQL	MDL										
ACETONE	10	9	19	U	34	U	33	U	10	U	10	U
BENZENE	5	1	5	U	5	U	5	U	5	U	3	J
BROMODICHLOROMETHANE	5	1	5	U	5	U	5	U	5	U	5	U
BROMOFORM	5	1	5	U	5	U	5	U	5	U	5	U
BROMOMETHANE	10	1	10	U	10	U	10	U	10	U	10	U
2-BUTANONE	10	5	10	U	10	U	10	U	10	U	10	U
CARBON DISULFIDE	5	1	5	U	5	U	5	U	5	U	5	U
CARBON TETRACHLORIDE	5	3	5	U	5	U	5	U	5	U	5	U
CHLOROBENZENE	5	0.9	5	U	5	U	5	U	5	U	5	U
CHLOROETHANE	10	2	10	U	10	U	10	U	10	U	10	U
CHLOROFORM	5	1	5	U	5	U	5	U	5	U	5	U
CHLOROMETHANE	10	1	10	U	10	U	10	U	10	U	10	U
DIBROMOCHLOROMETHANE	5	1	5	U	5	U	5	U	5	U	5	U
1,1-DICHLOROETHANE	5	2	5	U	5	U	5	U	5	U	5	U
1,2-DICHLOROETHANE	5	2	5	U	5	U	5	U	5	U	5	U
1,1-DICHLOROETHENE	5	2	5	U	5	U	5	U	5	U	5	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	U	5	U	5	U	5	U	5	U
1,2-DICHLOROPROPANE	5	1	5	U	5	U	5	U	5	U	5	U
CIS-1,3-DICHLOROPROPENE	5	1	5	U	5	U	5	U	5	U	5	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	U	5	U	5	U	5	U	5	U
ETHYLBENZENE	5	1	5	U	5	U	4	J	5	U	2	J
2-HEXANONE	10	4	10	U	10	U	10	U	10	U	10	U
METHYLENE CHLORIDE	5	8	14	U	14	U	14	U	12	U	10	U
4-METHYL-2-PENTANONE	10	5	10	U	10	U	10	U	10	U	10	U
STYRENE	5	1	5	U	5	U	5	U	5	U	5	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	U	5	U	5	U	5	U	5	U
TETRACHLOROETHENE	5	2	5	U	5	U	5	U	5	U	5	U
TOLUENE	5	1	5	U	5	U	5	U	5	U	5	U
1,1,1-TRICHLOROETHANE	5	2	5	U	5	U	5	U	5	U	5	U
1,1,2-TRICHLOROETHANE	5	1	5	U	5	U	5	U	5	U	5	U
TRICHLOROETHENE	5	2	5	U	5	U	5	U	5	U	5	U
VINYL ACETATE	10	5	10	U	10	U	10	U	10	U	10	U
VINYL CHLORIDE	10	2	10	U	10	U	10	U	10	U	10	U
TOTAL XYLENES	5	0.5	5	U	5	U	31		5	U	5	
DILUTION FACTOR:			1.0		1.0		1.0		1.0		1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:			62MW1GW01		71MW1GW01		DVRBGW01		DVTB1GW01		25MW1GW01	
LABORATORY ID:			B4034007		B4034008		B4034009		B4034010		B4034011	
TCL VOLATILE WATERS (UG/L)												
ANALYTE	CRQL	MDL										
ACETONE	10	9	10	U	10	U	10	U	22	U	10	U
BENZENE	5	1	5	U	5	U	5	U	5	U	5	U
BROMODICHLOROMETHANE	5	1	5	U	5	U	5	U	5	U	5	U
BROMOFORM	5	1	5	U	5	U	5	U	5	U	5	U
BROMOMETHANE	10	1	10	U	10	U	10	U	10	U	10	U
2-BUTANONE	10	5	10	U	10	U	10	U	10	U	10	U
CARBON DISULFIDE	5	1	5	U	5	U	5	U	5	U	5	U
CARBON TETRACHLORIDE	5	3	5	U	5	U	5	U	5	U	5	U
CHLOROBENZENE	5	0.9	16		5	U	5	U	5	U	5	U
CHLOROETHANE	10	2	10	U	10	U	10	U	10	U	10	U
CHLOROFORM	5	1	5	U	5	U	5	U	5	U	5	U
CHLOROMETHANE	10	1	10	U	10	U	10	U	10	U	10	U
DIBROMOCHLOROMETHANE	5	1	5	U	5	U	5	U	5	U	5	U
1,1-DICHLOROETHANE	5	2	5	U	5	U	5	U	5	U	5	U
1,2-DICHLOROETHANE	5	2	5	U	5	U	5	U	5	U	5	U
1,1-DICHLOROETHENE	5	2	5	U	5	U	5	U	5	U	5	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	U	5	U	5	U	5	U	5	U
1,2-DICHLOROPROPANE	5	1	5	U	5	U	5	U	5	U	5	U
CIS-1,3-DICHLOROPROPENE	5	1	5	U	5	U	5	U	5	U	5	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	U	5	U	5	U	5	U	5	U
ETHYLBENZENE	5	1	5	U	5	U	5	U	5	U	5	U
2-HEXANONE	10	4	10	U	10	U	10	U	10	U	10	U
METHYLENE CHLORIDE	5	8	11	U	12	U	12	U	14	U	13	U
4-METHYL-2-PENTANONE	10	5	10	U	10	U	10	U	10	U	10	U
STYRENE	5	1	5	U	5	U	5	U	5	U	5	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	U	5	U	5	U	5	U	5	U
TETRACHLOROETHENE	5	2	5	U	5	U	5	U	5	U	5	U
TOLUENE	5	1	5	U	5	U	5	U	5	U	5	U
1,1,1-TRICHLOROETHANE	5	2	5	U	5	U	5	U	5	U	5	U
1,1,2-TRICHLOROETHANE	5	1	5	U	5	U	5	U	5	U	5	U
TRICHLOROETHENE	5	2	5	U	5	U	5	U	5	U	5	U
VINYL ACETATE	10	5	10	U	10	U	10	U	10	U	10	U
VINYL CHLORIDE	10	2	10	U	10	U	10	U	10	U	10	U
TOTAL XYLENES	5	0.5	5	U	5	U	5	U	5	U	5	U
DILUTION FACTOR:			1.0		1.0		1.0		1.0		1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:			25B2SBDUP8		26MW3SB0406		26MW3SB1820	
LABORATORY ID:			B4032011		B4032012		B4032013	

TCL VOLATILE SOILS (UG/KG)

ANALYTE	CRQL	MDL						
ACETONE	10	9	51	U	24	U	26	U
BENZENE	5	1	6	U	5	U	6	U
BROMODICHLOROMETHANE	5	1	6	U	5	U	6	U
BROMOFORM	5	1	6	U	5	U	6	U
BROMOMETHANE	10	1	12	U	11	U	11	U
2-BUTANONE	10	5	12	U	11	U	11	U
CARBON DISULFIDE	5	1	6	U	5	U	6	U
CARBON TETRACHLORIDE	5	3	6	U	5	U	6	U
CHLOROBENZENE	5	0 9	6	U	5	U	6	U
CHLOROETHANE	10	2	12	U	11	U	11	U
CHLOROFORM	5	1	6	U	5	U	6	U
CHLOROMETHANE	10	1	12	U	11	U	11	U
DIBROMOCHLOROMETHANE	5	1	6	U	5	U	6	U
1,1-DICHLOROETHANE	5	2	6	U	5	U	6	U
1,2-DICHLOROETHANE	5	2	6	U	5	U	6	U
1,1-DICHLOROETHENE	5	2	6	U	5	U	6	U
1,2-DICHLOROETHENE (TOTAL)	5	2	6	U	5	U	6	U
1,2-DICHLOROPROPANE	5	1	6	U	5	U	6	U
CIS-1,3-DICHLOROPROPENE	5	1	6	U	5	U	6	U
TRANS-1,3-DICHLOROPROPENE	5	2	6	U	5	U	6	U
ETHYLBENZENE	5	1	6	U	5	U	6	U
2-HEXANONE	10	4	12	U	11	U	11	U
METHYLENE CHLORIDE	5	8	7	U	5	U	12	U
4-METHYL-2-PENTANONE	10	5	12	U	11	U	11	U
STYRENE	5	1	6	U	5	U	6	U
1,1,2,2-TETRACHLOROETHANE	5	2	6	U	5	U	6	U
TETRACHLOROETHENE	5	2	6	U	5	U	6	U
TOLUENE	5	1	6	U	5	U	6	U
1,1,1-TRICHLOROETHANE	5	2	6	U	5	U	6	U
1,1,2-TRICHLOROETHANE	5	1	6	U	5	U	6	U
TRICHLOROETHENE	5	2	6	U	5	U	6	U
VINYL ACETATE	10	3	12	U	11	U	11	U
VINYL CHLORIDE	10	2	12	U	11	U	11	U
TOTAL XYLENES	5	0 5	6	U	5	U	6	U
% SOLIDS:			86.0		92.0		90.0	
DILUTION FACTOR:			1.0		1.0		1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:			26B2SB0608		26B2SB0810		25MW1SB2628		25MW1SB2830		26MW2SB0810	
LABORATORY ID:			B4032001		B4032002		B4032003		B4032004		B4032005	
TCL VOLATILE SOILS (UG/KG)												
ANALYTE	CRQL	MDL										
ACETONE	10	9	42	U	49	U	26	U	54	U	78	U
BENZENE	5	1	6	U	6	U	6	U	6	U	6	U
BROMODICHLOROMETHANE	5	1	6	U	6	U	6	U	6	U	6	U
BROMOFORM	5	1	6	U	6	U	6	U	6	U	6	U
BROMOMETHANE	10	1	11	U	12	U	12	U	13	U	12	U
2-BUTANONE	10	5	6	J	12	UJ	12	UJ	13	UJ	12	U
CARBON DISULFIDE	5	1	6	U	6	U	6	U	6	U	6	U
CARBON TETRACHLORIDE	5	3	6	U	6	U	6	U	6	U	6	U
CHLOROBENZENE	5	0.9	6	U	6	U	6	U	6	U	6	U
CHLOROETHANE	10	2	11	U	12	U	12	U	13	U	12	U
CHLOROFORM	5	1	6	U	6	U	6	U	6	U	6	U
CHLOROMETHANE	10	1	11	U	12	U	12	U	13	U	12	U
DIBROMOCHLOROMETHANE	5	1	6	U	6	U	6	U	6	U	6	U
1,1-DICHLOROETHANE	5	2	6	U	6	U	6	U	6	U	6	U
1,2-DICHLOROETHANE	5	2	6	U	6	U	6	U	6	U	6	U
1,1-DICHLOROETHENE	5	2	6	U	6	U	6	U	6	U	6	U
1,2-DICHLOROETHENE (TOTAL)	5	2	6	U	6	U	6	U	6	U	6	U
1,2-DICHLOROPROPANE	5	1	6	U	6	U	6	U	6	U	6	U
CIS-1,3-DICHLOROPROPENE	5	1	6	U	6	U	6	U	6	U	6	U
TRANS-1,3-DICHLOROPROPENE	5	2	6	U	6	U	6	U	6	U	6	U
ETHYLBENZENE	5	1	6	U	6	U	6	U	6	U	6	U
2-HEXANONE	10	4	11	U	12	U	12	U	13	U	12	U
METHYLENE CHLORIDE	5	8	15	U	23	U	12	U	15	U	32	U
4-METHYL-2-PENTANONE	10	5	11	U	12	U	12	U	13	U	12	U
STYRENE	5	1	6	U	6	U	6	U	6	U	6	U
1,1,2,2-TETRACHLOROETHANE	5	2	6	U	6	U	6	U	6	U	6	U
TETRACHLOROETHENE	5	2	6	U	6	U	6	U	6	U	6	U
TOLUENE	5	1	6	U	6	U	6	U	6	U	6	U
1,1,1-TRICHLOROETHANE	5	2	6	U	6	U	6	U	6	U	6	U
1,1,2-TRICHLOROETHANE	5	1	6	U	6	U	6	U	6	U	6	U
TRICHLOROETHENE	5	2	6	U	6	U	6	U	6	U	6	U
VINYL ACETATE	10	3	11	U	12	U	12	U	13	U	12	U
VINYL CHLORIDE	10	2	11	U	12	U	12	U	13	U	12	U
TOTAL XYLENES	5	0.5	6	U	6	U	6	U	6	U	6	U
% SOLIDS:			87.0		84.0		84.0		77.0		82.0	
DILUTION FACTOR:			1.0		1.0		1.0		1.0		1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

TCL VOLATILE SOILS (UG/KG)

CLIENT ID:			26MW2SB1820		25B3SB0204		25B3SB1012		25B2SB0406		25B2SB1012	
LABORATORY ID:			B4032006		B4032007		B4032008		B4032009		B4032010	
ANALYTE	CRQL	MDL										
ACETONE	10	9	22	U	25	U	18	U	15	U	86	U
BENZENE	5	1	6	U	5	U	5	U	6	U	6	U
BROMODICHLOROMETHANE	5	1	6	U	5	U	5	U	6	U	6	U
BROMOFORM	5	1	6	U	5	U	5	U	6	U	6	U
BROMOMETHANE	10	1	11	U	11	U	11	U	11	U	11	U
2-BUTANONE	10	5	11	UJ	6	J	6	J	11	UJ	11	U
CARBON DISULFIDE	5	1	6	U	5	U	5	U	6	U	6	U
CARBON TETRACHLORIDE	5	3	6	U	5	U	5	U	2	J	6	U
CHLOROBENZENE	5	0.9	6	U	5	U	5	U	6	U	6	U
CHLOROETHANE	10	2	11	U	11	U	11	U	11	U	11	U
CHLOROFORM	5	1	6	U	5	U	5	U	6	U	6	U
CHLOROMETHANE	10	1	11	U	11	U	11	U	11	U	11	U
DIBROMOCHLOROMETHANE	5	1	6	U	5	U	5	U	6	U	6	U
1,1-DICHLOROETHANE	5	2	6	U	5	U	5	U	6	U	6	U
1,2-DICHLOROETHANE	5	2	6	U	5	U	5	U	6	U	6	U
1,1-DICHLOROETHENE	5	2	6	U	5	U	5	U	6	U	6	U
1,2-DICHLOROETHENE (TOTAL)	5	2	6	U	5	U	5	U	6	U	6	U
1,2-DICHLOROPROPANE	5	1	6	U	5	U	5	U	6	U	6	U
CIS-1,3-DICHLOROPROPENE	5	1	6	U	5	U	5	U	6	U	6	U
TRANS-1,3-DICHLOROPROPENE	5	2	6	U	5	U	5	U	6	U	6	U
ETHYLBENZENE	5	1	6	U	5	U	5	U	6	U	6	U
2-HEXANONE	10	4	11	U	11	U	11	U	11	U	11	U
METHYLENE CHLORIDE	5	8	6	U	5	U	7	U	9	U	27	U
4-METHYL-2-PENTANONE	10	5	11	U	11	U	11	U	11	U	11	U
STYRENE	5	1	6	U	5	U	5	U	6	U	6	U
1,1,2,2-TETRACHLOROETHANE	5	2	6	U	5	U	5	U	6	U	6	U
TETRACHLOROETHENE	5	2	6	U	5	U	5	U	6	U	6	U
TOLUENE	5	1	6	U	5	U	5	U	1	J	6	U
1,1,1-TRICHLOROETHANE	5	2	6	U	5	U	5	U	2	J	6	U
1,1,2-TRICHLOROETHANE	5	1	6	U	5	U	5	U	6	U	6	U
TRICHLOROETHENE	5	2	6	U	5	U	5	U	6	U	6	U
VINYL ACETATE	10	3	11	U	11	U	11	U	11	U	11	U
VINYL CHLORIDE	10	2	11	U	11	U	11	U	11	U	11	U
TOTAL XYLENES	5	0.5	6	U	5	U	5	U	6	U	6	U
% SOLIDS:			88.0		93.0		93.0		90.0		87.0	
DILUTION FACTOR:			1.0		1.0		1.0		1.0		1.0	

APPENDIX E-4

FIELD QC SAMPLES

TPHAQ1 SOG 46MW1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		DVFB2		DVFB1
LABORATORY ID:		B4031106		B4031107
INORGANIC WATERS (MG/L)				
ANALYTE	RDL			
TOTAL PETROLEUM HYDROCARBONS	0.25	0.25	U	0.84

TPHAQ2 SPG 46MW1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		46MW2RB1	47B1RB1	46MW2RB2	48MW2RB4	48MW2RB5
LABORATORY ID:		B4031115	B4031116	B4031118	B4031301	B4031302
INORGANIC WATERS (MG/L)						
ANALYTE	RDL					
TOTAL PETROLEUM HYDROCARBONS	0.25	2.2	2.6	3	1.6	4.7

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		65MW1RB6	65MW1RB7
LABORATORY ID:		B4031303	B4031304
INORGANIC WATERS (MG/L)			
ANALYTE	RDL		
TOTAL PETROLEUM HYDROCARBONS	0.25	3.9	2.1

TPH AQ1 SDG 10MW1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		56MW1RB8	56MW1RB9
LABORATORY ID:		B4031419	B4031420
INORGANIC WATERS (MG/L)			
ANALYTE	RDL		
TOTAL PETROLEUM HYDROCARBONS	0.25	9.6	8.1

TPH AQ1 SDG 6B1

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		7B1SBRB10	7B1SBRB11
LABORATORY ID:		B4031515	B4031516
INORGANIC WATERS (MG/L)			
ANALYTE	RDL		
TOTAL PETROLEUM HYDROCARBONS	0.25	12	11

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		DVRB14		DVRB15	
LABORATORY ID:		B4031727		B4031728	

WET CHEMISTRY WATERS (MG/L)

ANALYTE	RDL				
TOTAL PETROLEUM HYDROCARBONS	0 25	0.25	U	0 25	U

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID.		DVRB16		DVRB17	
LABORATORY ID:		B4032015		B4032016	
WET CHEMISTRY WATERS (MG/L)					
ANALYTE	RDL				
TOTAL PETROLEUM HYDROCARBONS	0 25	0.25	U	0 25	U

TPHAQ1 SDG 381

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:		11B2RB18	11B2RB19	
LABORATORY ID:		B4031917	B4031918	

INORGANIC WATERS (MG/L)

ANALYTE	RDL			
TOTAL PETROLEUM HYDROCARBONS	0.25	3	0.25	U

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID:			DVFB2		DVFB1		DVTB1		DVTB2	
LABORATORY ID:			B4031106		B4031107		B4031117		B4031305	
TCL VOLATILE WATERS (UG/L)										
ANALYTE	CRQL	MDL								
ACETONE	10	9	10	U	12	U	10	U	10	UJ
BENZENE	5	1	5	UJ	5	UJ	5	UJ	5	UJ
BROMODICHLOROMETHANE	5	1	5	UJ	5	UJ	5	UJ	5	UJ
BROMOFORM	5	1	5	UJ	5	UJ	5	UJ	5	UJ
BROMOMETHANE	10	1	10	UJ	10	UJ	10	UJ	10	UJ
2-BUTANONE	10	5	10	UJ	10	UJ	10	UJ	10	UJ
CARBON DISULFIDE	5	1	5	UJ	5	UJ	5	UJ	5	UJ
CARBON TETRACHLORIDE	5	3	5	UJ	5	UJ	5	UJ	5	UJ
CHLOROBENZENE	5	0.9	5	UJ	5	UJ	5	UJ	5	UJ
CHLOROETHANE	10	2	10	UJ	10	UJ	10	UJ	10	UJ
CHLOROFORM	5	1	5	UJ	2	J	5	UJ	5	UJ
CHLOROMETHANE	10	1	10	UJ	10	UJ	10	UJ	10	UJ
DIBROMOCHLOROMETHANE	5	1	5	UJ	5	UJ	5	UJ	5	UJ
1,1-DICHLOROETHANE	5	2	5	UJ	5	UJ	5	UJ	5	UJ
1,2-DICHLOROETHANE	5	2	5	UJ	5	UJ	5	UJ	5	UJ
1,1-DICHLOROETHENE	5	2	5	UJ	5	UJ	5	UJ	5	UJ
1,2-DICHLOROETHENE (TOTAL)	5	2	5	UJ	5	UJ	5	UJ	5	UJ
1,2-DICHLOROPROPANE	5	1	5	UJ	5	UJ	5	UJ	5	UJ
CIS-1,3-DICHLOROPROPENE	5	1	5	UJ	5	UJ	5	UJ	5	UJ
TRANS-1,3-DICHLOROPROPENE	5	2	5	UJ	5	UJ	5	UJ	5	UJ
ETHYLBENZENE	5	1	5	UJ	5	UJ	5	UJ	5	UJ
2-HEXANONE	10	4	10	UJ	10	UJ	10	UJ	10	UJ
METHYLENE CHLORIDE	5	8	5	U	10	U	5	U	5	U
4-METHYL-2-PENTANONE	10	5	10	UJ	10	UJ	10	UJ	10	UJ
STYRENE	5	1	5	UJ	5	UJ	5	UJ	5	UJ
1,1,2,2-TETRACHLOROETHANE	5	2	5	UJ	5	UJ	5	UJ	5	UJ
TETRACHLOROETHENE	5	2	3	J	5	UJ	5	UJ	5	UJ
TOLUENE	5	1	5	UJ	5	UJ	5	UJ	5	UJ
1,1,1-TRICHLOROETHANE	5	2	5	UJ	3	J	5	UJ	5	UJ
1,1,2-TRICHLOROETHANE	5	1	5	UJ	5	UJ	5	UJ	5	UJ
TRICHLOROETHENE	5	2	5	UJ	5	UJ	5	UJ	5	UJ
VINYL ACETATE	10	5	10	UJ	10	UJ	10	UJ	10	UJ
VINYL CHLORIDE	10	2	10	UJ	10	UJ	10	UJ	10	UJ
TOTAL XYLENES	5	0.5	5	UJ	5	UJ	5	UJ	5	UJ
DILUTION FACTOR:			1.0		1.0		1.0		1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID: DV-TB3
LABORATORY ID: B4031608

TCL VOLATILE WATERS (UG/L)

ANALYTE	CRQL	MDL		
ACETONE	10	9	10	U
BENZENE	5	1	5	U
BROMODICHLOROMETHANE	5	1	5	U
BROMOFORM	5	1	5	U
BROMOMETHANE	10	1	10	U
2-BUTANONE	10	5	10	U
CARBON DISULFIDE	5	1	5	U
CARBON TETRACHLORIDE	5	3	5	U
CHLOROBENZENE	5	0.9	5	U
CHLOROETHANE	10	2	10	U
CHLOROFORM	5	1	5	U
CHLOROMETHANE	10	1	10	U
DIBROMOCHLOROMETHANE	5	1	5	U
1,1-DICHLOROETHANE	5	2	5	U
1,2-DICHLOROETHANE	5	2	5	U
1,1-DICHLOROETHENE	5	2	5	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	U
1,2-DICHLOROPROPANE	5	1	5	U
CIS-1,3-DICHLOROPROPENE	5	1	5	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	U
ETHYLBENZENE	5	1	5	U
2-HEXANONE	10	4	10	U
METHYLENE CHLORIDE	5	8	5	U
4-METHYL-2-PENTANONE	10	5	10	U
STYRENE	5	1	5	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	U
TETRACHLOROETHENE	5	2	5	U
TOLUENE	5	1	5	U
1,1,1-TRICHLOROETHANE	5	2	5	U
1,1,2-TRICHLOROETHANE	5	1	5	U
TRICHLOROETHENE	5	2	5	U
VINYL ACETATE	10	5	10	U
VINYL CHLORIDE	10	2	10	U
TOTAL XYLENES	5	0.5	5	U
DILUTION FACTOR:			1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID: DVTB6
LABORATORY ID: B4031919RI

TCL VOLATILE WATERS (UG/L)

ANALYTE	CRQL	MDL		
ACETONE	10	9	14	U
BENZENE	5	1	5	U
BROMODICHLOROMETHANE	5	1	5	U
BROMOFORM	5	1	5	U
BROMOMETHANE	10	1	10	U
2-BUTANONE	10	5	11	
CARBON DISULFIDE	5	1	5	U
CARBON TETRACHLORIDE	5	3	5	U
CHLOROBENZENE	5	0.9	5	U
CHLOROETHANE	10	2	10	U
CHLOROFORM	5	1	5	U
CHLOROMETHANE	10	1	10	U
DIBROMOCHLOROMETHANE	5	1	5	U
1,1-DICHLOROETHANE	5	2	5	U
1,2-DICHLOROETHANE	5	2	5	U
1,1-DICHLOROETHENE	5	2	5	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	U
1,2-DICHLOROPROPANE	5	1	5	U
CIS-1,3-DICHLOROPROPENE	5	1	5	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	U
ETHYLBENZENE	5	1	5	U
2-HEXANONE	10	4	10	U
METHYLENE CHLORIDE	5	8	15	U
4-METHYL-2-PENTANONE	10	5	10	U
STYRENE	5	1	5	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	U
TETRACHLOROETHENE	5	2	5	U
TOLUENE	5	1	5	U
1,1,1-TRICHLOROETHANE	5	2	5	U
1,1,2-TRICHLOROETHANE	5	1	5	U
TRICHLOROETHENE	5	2	5	U
VINYL ACETATE	10	5	10	U
VINYL CHLORIDE	10	2	10	U
TOTAL XYLENES	5	0 5	5	U
DILUTION FACTOR:			1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID: DVTB4
LABORATORY ID: B4031703

TCL VOLATILE WATERS (UG/L)

ANALYTE	CRQL	MDL		
ACETONE	10	9	22	U
BENZENE	5	1	5	U
BROMODICHLOROMETHANE	5	1	5	U
BROMOFORM	5	1	5	U
BROMOMETHANE	10	1	10	U
2-BUTANONE	10	5	10	U
CARBON DISULFIDE	5	1	5	U
CARBON TETRACHLORIDE	5	3	5	U
CHLOROBENZENE	5	0.9	5	U
CHLOROETHANE	10	2	10	U
CHLOROFORM	5	1	5	U
CHLOROMETHANE	10	1	10	U
DIBROMOCHLOROMETHANE	5	1	5	U
1,1-DICHLOROETHANE	5	2	5	U
1,2-DICHLOROETHANE	5	2	5	U
1,1-DICHLOROETHENE	5	2	5	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	U
1,2-DICHLOROPROPANE	5	1	5	U
CIS-1,3-DICHLOROPROPENE	5	1	5	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	U
ETHYLBENZENE	5	1	5	U
2-HEXANONE	10	4	10	U
METHYLENE CHLORIDE	5	8	40	U
4-METHYL-2-PENTANONE	10	5	10	U
STYRENE	5	1	5	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	U
TETRACHLOROETHENE	5	2	5	U
TOLUENE	5	1	5	U
1,1,1-TRICHLOROETHANE	5	2	5	U
1,1,2-TRICHLOROETHANE	5	1	5	U
TRICHLOROETHENE	5	2	5	U
VINYL ACETATE	10	5	10	U
VINYL CHLORIDE	10	2	10	U
TOTAL XYLENES	5	0.5	5	U
DILUTION FACTOR:			1.0	

CTO 178, NCBC DAVISVILLE, DAVISVILLE, RHODE ISLAND
RECRA ENVIRONMENTAL, INC.

CLIENT ID: DVTB5
LABORATORY ID: B4032014

TCL VOLATILE WATERS (UG/L)

ANALYTE	CRQL	MDL		
ACETONE	10	9	20	U
BENZENE	5	1	5	U
BROMODICHLOROMETHANE	5	1	5	U
BROMOFORM	5	1	5	U
BROMOMETHANE	10	1	10	U
2-BUTANONE	10	5	10	U
CARBON DISULFIDE	5	1	5	U
CARBON TETRACHLORIDE	5	3	5	U
CHLOROBENZENE	5	0.9	5	U
CHLOROETHANE	10	2	10	U
CHLOROFORM	5	1	5	U
CHLOROMETHANE	10	1	10	U
DIBROMOCHLOROMETHANE	5	1	5	U
1,1-DICHLOROETHANE	5	2	5	U
1,2-DICHLOROETHANE	5	2	5	U
1,1-DICHLOROETHENE	5	2	5	U
1,2-DICHLOROETHENE (TOTAL)	5	2	5	U
1,2-DICHLOROPROPANE	5	1	5	U
CIS-1,3-DICHLOROPROPENE	5	1	5	U
TRANS-1,3-DICHLOROPROPENE	5	2	5	U
ETHYLBENZENE	5	1	5	U
2-HEXANONE	10	4	10	U
METHYLENE CHLORIDE	5	8	76	U
4-METHYL-2-PENTANONE	10	5	10	U
STYRENE	5	1	5	U
1,1,2,2-TETRACHLOROETHANE	5	2	5	U
TETRACHLOROETHENE	5	2	5	U
TOLUENE	5	1	5	U
1,1,1-TRICHLOROETHANE	5	2	5	U
1,1,2-TRICHLOROETHANE	5	1	5	U
TRICHLOROETHENE	5	2	5	U
VINYL ACETATE	10	5	10	U
VINYL CHLORIDE	10	2	10	U
TOTAL XYLENES	5	0.5	5	U
DILUTION FACTOR:			1.0	