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Study Area Screening Evaluation

for

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NUSC Disposal Area
Naval Underwater Warfare Center
Middletown, Rhode Island

Engineering Field Activity Northeast
Naval Facilities Engineering Command

Contract Number N62472-94-D-0888
Contract Task Order 0849

April 2004

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STUDY AREA SCREENING EVALUATION

FOR

NUSC DISPOSAL AREA
NAVAL UNDERWATER WARFARE CENTER
MIDDLETOWN, RHODE ISLAND

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION - NAVY (CLEAN) CONTRACT

Submitted to:
Environmental Branch (Code EV2)
Environmental Field Activity, Northeast
Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop # 82
Lester, Pennsylvania 19113

Submitted by:
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CONTRACT TASK ORDER 0849

April 2004

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Study Area Screening Evaluation
NUSC Disposal Area
Naval Underwater Warfare Center
Middletown, Rhode Island

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SA08, NUSC DISPOSAL AREA

PICTURES AND VIDEO OF TEST PIT EXCAVATIONS
NAVAL STATION NEWPORT
NEWPORT, RHODE ISLAND

TETRA TECH NUS, INC.

Engineering Field Activity Northeast
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0833

APRIL 2004

SA08, NUSC DISPOSAL AREA

PICTURES AND VIDEO OF TEST PIT EXCAVATIONS
NAVAL STATION NEWPORT
NEWPORT, RHODE ISLAND

TETRA TECH NUS, INC.

Engineering Field Activity Northeast
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0833

APRIL 2004

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April 21, 2004

COPY

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Reference: CLEAN Contract No. N62467-94-D-0888
Contract Task Order No. 0849

Subject: Draft SASE Report
Study Area 08, NUSC Disposal Area
Naval Underwater Warfare Center, Middletown Rhode Island

Dear Mr. Frye:

Enclosed you will find four copies of the draft Study Area Screening Evaluation report for the site referenced above.

If you have any questions regarding this material, please do not hesitate to contact me.

Very truly yours,

Stephen S. Parker, LSP
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SSP/rp

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File N8856-3.2 (w/o encl.), N8856-8.0 (orig)

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ACRONYMS

AAL	Rhode Island Ambient Air Limit
ACOE	U. S. Army Corps of Engineers
ARAR	Applicable or Relevant and Appropriate Requirement
AVS	Acid Volatile Sulfide
AWQC-CCC	Ambient Water Quality Criteria-Critical Continuous Concentrations
B&RE	Brown & Root Environmental
BAF	Biota-soil Bioaccumulation Factor
BERA	Baseline Ecological Risk Assessment
BGS	Below Ground Surface
BLRA	Baseline Risk Assessment
BSAF	Biota-sediment Bioaccumulation Factor
CAD	Contained Aquatic Disposal
CDI	Chronic Daily Intake
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long Term Environmental Action Navy
COC	Chemical of Concern
COPC	Chemical of Potential Concern
CSM	Conceptual Site Model
CTE	Central Tendency Exposure
CTO	Contract Task Order
CUST	Concrete Underground Storage Tank
DNAPL	Dense Non-Aqueous Phase Liquid
DON	Department of the Navy
DOT	Department of Transportation
DPT	Direct Push Technology
EBS	Environmental Baseline Survey
Eco SSL	Ecological Soil Screening Level
EEQ	Ecological Effects Quotient
EFA Northeast	Engineering Field Activity Northeast
EPA	U. S. Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
ER-L	Effects Range-Low: NOAA Adverse Effects Benchmark Value for Sediment
ER-M	Effects Range-Median: NOAA Adverse Effects Benchmark Value for Sediment
FFA	Federal Facilities Interagency Agreement
FID	Flame Ionization Detector
FMR	Field Modification Record
FS	Feasibility Study
FWENC	Foster Wheeler Environmental Corporation
GRA	General Response Action
HHRA	Human Health Risk Assessment
HI	Hazard Index

ACRONYMS (cont.)

HMW	High Molecular Weight
HPLC	High Performance Liquid Chromatography
HQ	Hazard Quotient
IAS	Initial Assessment Study
ICR	Integrated Cancer Risk
IDW	Investigation Derived Waste
IEUBK	Integrated Exposure and Uptake Biokinetic Model
IRP	Installation Restoration Program
IS-PRE	Industrial Soil Human Health Preliminary Remediation Goal
IU/BK	Integrated Uptake/Biokinetic Model
LMW	Low Molecular Weight
LNAPL	Light Non-Aqueous Phase Liquid
LOAEL	Lowest Observed Adverse Effects Level
MCL	Maximum Contaminant Level
mg/kg	Milligram per kilogram
mg/L	Milligram per liter
MLW	Mean Low Water Level
NAPL	Non-Aqueous Phase Liquid
NAVSTA	Naval Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NETC	Naval Education and Training Center
NGVD	National Geodetic Vertical Datum
NIOSH	National Institute for Occupational Safety and Health
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No Observed Adverse Effects Level
NORTHDIV	Northern Division
NPL	National Priorities List
NS	Nearshore
NSN	Naval Station Newport
NTU	Nephelometric Turbidity Units
NUSC	Naval Underwater Systems Center
NUWC	Naval Underwater Warfare Center
O&M	Operation and Maintenance
ORP	Oxidation Reduction Potential
OS	Offshore
OSHA	Occupational Safety and Health Administration
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PDI	Pre-Design Investigation
PID	Photoionization Detector
POTW	Publicly-Owned Treatment Works
PPE	Personnel Protective Equipment

ACRONYMS (cont.)

PRG	Preliminary Remedial Goal
PVC	Polyvinyl Chloride
RAB	Restoration Advisory Board
RAG	Risk Assessment Guidance
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RI	Remedial Investigation
RIDEM	Rhode Island Department of Environmental Management
RME	Reasonable Maximum Exposure
ROD	Record of Decision
RQD	Rock Quality Designation
SARA	Superfund Amendment and Reauthorization Act
SASA	Study Area Screening Evaluation
SdSL	Sediment Screening Level
SEM	Simultaneously Extracted Metal
SERA	Screening-level Ecological Risk Assessment
SF	Slope Factor
SMDP	Scientific Management Decision Point
Soil DEC	Soil Direct Exposure Criteria
SOP	Standard Operating Procedure
SQG	Soil Quality Guideline
SRA	Screening Risk Assessment
SSSL	Surface Soil Screening Level
SVOC	Semivolatile Organic Compound
SWSL	Surface Water Screening Level
TAL	Target Analyte List
TBC	To Be Considered Guidance
TCL	Target Compound List
TCLP	Toxic Characteristic Leaching Procedure
TCR	Tissue Concentration Ratio
TEV-HQ	Threshold Effects Value – Hazard Quotient
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TRC	TRC Environmental Corporation
TRV	Toxicity Reference Value
TSDF	Treatment, Storage, and Disposal Facility
TSS	Total Suspended Solids
TWA	Time-Weighted Average Concentration
UCL	Upper Confidence Limit
μg/dl	Micrograms per deciliter

ACRONYMS (cont.)

µg/kg	Microgram per kilogram
µg/L	Microgram per liter
µmo/g	Micromoles per gram
URI	University of Rhode Island
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The Study Area Screening Evaluation for the NUSC Disposal Area (SA-08) was conducted in June-November 2003. The Study Area Screening Evaluation (SASE) was conducted to determine if contaminants were present at concentrations exceeding risk based standards, and to determine if additional investigations are necessary under the Installation Restoration program. The investigation was conducted in accordance with the work plan for Study Area Screening Evaluation, prepared by Brown and Root Environmental January 1998, and revised by Tetra Tech NUS, Inc. June 2003.

The NUSC disposal area consists of approximately 8 acres of land adjacent to two streams, associated wetlands and a small pond. The upland portions were used as a fill area and storage areas since the Navy developed the area in the early 1950s. Currently there is a secured storage area and open storage area (both paved – approximately 2.3 acres) as well as open fields (1.6 acres) and brush covered areas (4.2 acres).

The study included a passive soil gas investigation, collection of sediment and surface water samples from 9 stations in the streams and pond on site, excavation of 16 test pits in unpaved areas across the site and installation of 11 soil borings in paved and unpaved areas of the site. Three soil samples were collected from each test pit and soil boring, as described in the work plan. Four groundwater wells were installed into the bedrock aquifer at the site. No overburden aquifer was found during the investigation.

The passive soil gas analysis indicated some areas where elevated VOCs were present, and these, along with other target areas identified in the work plan were investigated with a series of test pits, soil borings, and groundwater monitoring wells. Chlorinated solvents (trichloroethene - TCE and tetrachloroethene - PCE) were found in groundwater at the north (downgradient) end of the site. TCE was also found in soil gas in the central portion of the site, near drums which were found buried in the ground, although only low concentrations of TCE were detected in soils and groundwater in this area. In the south eastern portion of the site, methylbenzene compounds were detected at elevated concentrations in soil under the pavement.

Other findings included a large number of what appear to be aerosol paint cans in the stream embankment in the south west portion of the site, confirmed through test pit excavation in this area. Elevated concentrations of lead were found co-located with these containers and in the stream sediments downstream as far as the NUWC pond.

The initial steps of a human health and ecological risk assessment were conducted to identify contaminants of potential concern (COPCs) for the site. Based on the concentrations detected, PAHs

and arsenic are expected to provide the highest elevated risk to industrial receptors from exposure to soil and sediment. Lead also offers a likely elevated risk from exposure to sediment. Arsenic, cadmium, TCE and PCE exceed the applicable federal maximum contaminant levels (MCLs) for groundwater. Pesticides and metals, most prominently arsenic, mercury, lead and zinc were identified as COPCs for ecological screening, although pesticide detections were infrequent. PCBs and PAHs were also identified as contributing to ecological risk, but less prominently than the others.

Taken collectively, the data evaluated in the SASE indicates that fill, containing different types of contaminants has been placed at the site over time. Some of these contaminants have been released from the fill through leaching or percolation, and have moved from the fill areas to the stream and to the groundwater. Other contaminants within the fill have not been released, due to the inherent nature of those contaminants to be resistant to chemical change or physical movement.

Based on these findings, two conclusions are made. First, limited removal actions may be warranted to remove drums of possible roofing tar and/or other unknown substances. Secondly, additional efforts will be required to complete a remedial investigation, which will include baseline human health and ecological risk assessments.

1.0 INTRODUCTION

This report has been prepared under the Comprehensive Long Term Environmental Action Navy (CLEAN) Contract No. N62472-94-D-0888, Contract Task Order (CTO) 849. The statement of work requires Tetra Tech NUS, Inc. (TtNUS) to perform a Study Area Screening Evaluation (SASE) for Study Area 08, which consists of the NUSC Disposal Area, part of the Naval Underwater Warfare Center, Middleton, Rhode Island. This report describes the activities and the findings of the first phase of this investigation.

Study Area 08 was originally identified as a Study Area in the Federal Facilities Agreement because of records of land disposal of solid wastes and general fill during the 1950s through the 1980s. The site has been only used for a large materials storage area since the 1980s.

1.1 SITE-SPECIFIC INVESTIGATION OBJECTIVES

The investigation objectives for this effort were to identify and characterize potential environmental contamination resulting from former land disposal activities and to assess potential pathways for releases of contamination to the soil, sediment, surface water and groundwater. The findings will be used as a first phase of a Remedial Investigation.

Section 2.0 of this report presents a description of the field work performed during this investigation. Tasks are listed in chronological order of execution. Sample collection procedures and analytical parameters are also described in this section. Section 3.0 presents a summary of the physical conditions at the site including basic site features, geology, and hydrology of the site. Section 4.0 presents the data collected and the findings of the sample collection. Section 5.0 presents a brief description of fate and transport characteristics of the contaminants detected. Section 6.0 is withheld to provide a discussion of background soil conditions, after they are evaluated. Sections 7.0 and 8.0 provide screening level human health and ecological risk evaluations, and Section 9.0 presents a report summary.

1.2 BACKGROUND INFORMATION

The following section presents the background information used to design the Study Area Screening Evaluation (SASE) for the site. State property records and the filling and development history of the site were reviewed. A description and history of the site and the surrounding region is detailed.

1.2.1 Site Location

The NUSC Disposal Area (the site) is located on the northwestern boundary of the Naval Underwater Warfare Center (NUWC), formerly called the Naval Underwater Systems Center (NUSC). As described in the Initial Assessment Study (IAS) (Envirodyne, 1983), the site is referred to as the NUSC Disposal Area. The study area for this project occupies approximately 1 acre north of Building 185 and Cunningham Street. The location of the NUSC Disposal Area is shown on Figure 1-1. A map of the site is provided as Figure 1-2.

As depicted on Figure 1-2, the Wanumetonomy Golf & Country Club borders the site to the north. Building No. 185, consisting of a series of four open-sided, covered sheds, with 2-foot concrete berms are considered the southeastern extent of the site. These sheds are used for the storage of drummed oils and torpedo propellants. A small stream, termed Deerfield Creek, and the surrounding wetlands make up the southwestern site boundary. The NUSC Disposal Area extends west-northwest to the small pond known as "Deerfield Pond" or "NUWC pond".

1.2.2 Site Description

The site can be physically characterized as an elevated stream embankment area bordering Deerfield Creek to the southwest. A second small unnamed stream flows through the northern portion of the site to Deerfield Creek in an east-west direction. This stream originates from the golf course northeast of the site, flows into Deerfield Creek on the west of the site and into NUWC Pond northwest of the site. The pond discharges through a culvert at the north end, which, in turn, discharges to Narragansett Bay, at a point south of McAllister Point Landfill.

North of the unnamed stream is a flat, grass covered, plateau-like area, referred to for this report as the North Meadow. East of Deerfield Creek and to the north of Building No. 185 is another elevated flat area, termed for this report as the South Meadow. There are two paved materials storage areas located adjacent to one another. The western paved section is partially fenced and open to access on the southern edge, near the Building 185 complex. The eastern section is gated to restrict access to the stored materials. The storage areas are used by NUWC for the temporary storage of large equipment such as steel buoys, empty torpedo shells, cable reels, molds, jigs and other large miscellaneous equipment.

Site topography is highly variable, with topographic relief of approximately 33 feet from the northern to the southern portions of the site. Elevations range from approximately 58 feet at the southeast corner of

the study area to 25 feet, which was the measured elevation for the pond water at the north end of the study area.

Grasses and thick vegetation cover approximately 70 percent of the site. The north meadow consists of open field with invasive woody plants encroaching from the slopes that surround it. South and southeast of this zone, dense shrubs and small trees vegetate the swale containing the unnamed stream and a fill area immediately south of that stream. The southern meadow is also largely open field, with invasive woody plants encroaching from the north and west. The steep valley that is formed by Deerfield Creek is similarly vegetated with shrubs, thickets, and trees.

1.2.3 Regional Property Record and Land Use

A title search at the Middletown, Rhode Island town hall was conducted February 13, 2003. Early records indicate that the site and surrounding area was developed for agriculture usage. The property located to the northeast of the site and owned by the Wanumetonomy Golf Course, Inc., was initially owned by Gideon Brown who conveyed the property to Pardon Brown Sanford in 1887, the earliest recording accessed. The property was conveyed several more times and was maintained as a farm until January 7, 1926 when it was purchased by the Wanumetonomy Golf Course, Inc. The golf course was constructed on the property in the late 1920s.

On March 27, 1942 a part of the golf course was deemed condemned land. Based on the description in the deed, the condemned land is assumed to contain the study area. On May 22, 1942 the land was conveyed to the United States Navy. The large tract of land abutting the Wanumetonomy Golf Course and owned by the US Navy, is identified on the Tax Assessor's map as Plate 106, Lot 2.

1.2.4 Previous Site Investigations and History

The IAS report identified areas at the Naval Education and Training Center (NETC), presently known as Naval Station Newport (NSN), where potential contamination from past waste disposal or handling practices may pose human health or environmental risks. The NUSC Disposal Area was reviewed under the IAS and the area investigated is shown on Figure 1-2, as obtained from Figure 6.6.8 of the IAS report (Envirodyne, 1983).

There is limited available historical information on the NUSC Disposal Area. Reviewed documentation reported the site to be used for the disposal of scrap lumber, tires, wire, cable, and empty paint cans for an unspecified period of time (Envirodyne, 1983).

An Environmental Baseline Survey (EBS) Checklist for the NUWC Pond was conducted in 2002 by Naval Station Newport. According to the report, the Wanumetonomy Golf Course and Country Club pumped pond water from NUWC Pond, also referred to as Deerfield Pond, for irrigation purposes. Documentation pertaining to a water use arrangement agreement between the Navy and the golf course is dated 1974. Pond water was pumped from the pond to the golf course property until the spring of 1996, according to the report (NSN, 2002).

The EBS Checklist for the NUWC Pond referenced several water quality assessment sampling events: one conducted in 1995 in which only surface water was sampled, and one in 1996 that assessed both the pond surface water and the sediment. According to the most recent evaluation, conducted in the winter of 2002, levels of lead and aluminum exceed a criterion or standard, respectively. Sediment samples detected inorganic contaminants and pesticides above a criterion or standard (NSN, 2002).

A former underground storage tank located upgradient (south) of NUSC Disposal Area was the subject of the Building 179 Concrete UST (CUST) Remedial Investigation conducted in December 1999 by TRC Environmental Corporation. The primary contaminants of concern were chlorinated VOCs, including 1,1,1-trichloroethane which was found in the groundwater. VOCs, SVOCs, TPH, and total cyanide were detected in surface water and/or sediment samples collected from Deerfield Creek (as referenced in NSN, 2002). The contaminant concentrations were compared to NOAA critical continuous concentration (CCC) values which were used for comparative purposes only in absence of specific RIDEM surface water/sediment criteria. One surface water sample collected east of the CUST had a total cyanide concentration that exceeded the NOAA CCC. SVOCs present in the sediment samples at concentrations above at least one of the NOAA standards included pyrene, benzo(a)anthracene, and chrysene (TRC, 1999).

Aerial photographs of the site dating from 1942, 1951, 1963, 1965, 1970, 1975, 1981, and 1988 were reviewed at the Rhode Island Department of Administration, Division of Planning. Information gathered from these photos is presented below, and summarized on Figure 1-3.

- According to the 1942 aerial photo, there is no evidence of activity in the vicinity of the reported NUSC Disposal Area. The pond located northwest of the site is present. The North Meadow area is evident on this photograph as an open, grassy field.

- According to the 1951 photo, the perimeter of the pond area adjacent to the site was consistent with the 1942 photo; however, the pond appears nearly dry, with water visible only at its northwestern end. An area of light-colored soil, which may be indicative of ground disturbance, is located just northwest of Building 185.

- The 1963 and 1965 photos are consistent with that taken in 1951, although the area of light-colored soils, or possible filling, located northeast of the open storage area, is somewhat larger.

- A 1970 photo shows the disturbed area extended to the west of that shown on the 1951, 1963, and 1965 photos.

- Clear evidence of filling at the NUSC Disposal Area (as indicated in the IAS), is shown on the 1981 and 1988 aerial photographs. The 1981 photograph shows mounds of soil on the southern edge of the unnamed stream. This photo also shows possible fill activity in the area which is now covered by the paved, gated storage area, north of Building 185. The 1988 photograph shows a crescent shaped area of ground disturbance, on the southern portion of the North Meadow. The extent of the disposal area, as highlighted by light colored material and mounds of soil, appears to reach north towards the pond in the 1988 photograph.

- Two roadway turnouts are visible on the 1981 photo, indicating possible traffic to the North Meadow, and alongside Deerfield Creek, west of the paved open storage area.

In summary, aerial photography indicates disturbance or fill in the areas which are shown on Figure 1-2 and Figure 1-3 as the paved storage areas, the South Meadow, and the southernmost portions of the North Meadow. This material is present in aerial photos dated 1951 through 1988, southeast of the unnamed stream which flows into the site from the golf course. These fill areas were targeted for investigation for the SASE as described in this report.

1.2.5 Records of Historical Waste Disposal Practices

Available site background information (Envirodyne, 1983) indicates that the NUSC Disposal Area was used for disposal of the following:

- Scrap Lumber
- Tires
- Wire
- Cable
- Empty Paint Cans

The IAS report describes several former NUSC operations which had the potential to generate hazardous materials. These operations included industrial plating, anodizing and chemical cleaning within Building

1170 (located approximately 200 feet southwest of the site), and PCB storage at an unnamed location. Available information does not indicate disposal of these materials at the NUSC Disposal Area.

Possible chemical hazards may include VOCs and heavy metals from paint residues, as well as methane produced from the natural decomposition of organic materials.

In 1998, a member of the NAVSTA Restoration Advisory Board, who was also a former employee of the NUSC, stated that in the 1970s there had been two concrete cylinders set in the ground into which NUSC chemists were to dispose of chemicals. One was to be used for alkaline chemicals and the other was to be used for acidic chemicals. The former employee accompanied investigators to the site in June 2003 and identified areas that may have been the location of these previous disposal areas. He also pointed out that he had never actually seen them used. This area was included in the SASE investigation (Cormier, 2003).

Finally, the Building 185 complex is a possible source of contaminants. Building 185 is a series of four open sheds clearly used for storage of flammable materials. All are caged with chain link fencing, fitted with fixed roofs, and concrete berms approximately one foot in height (Figure 1-4). It is unclear what materials were stored in these areas, however, one locked steel box located between two of the sheds is labeled "Flammable", and a second steel box is labeled "Ottofuel". Ottofuel is a highly flammable material that is composed largely of 2-nitrodiphenylamine, used for fueling torpedoes. The chemical makeup is such that it can burn freely in a no-oxygen environment. No records were found of disposal or releases of Ottofuel in this area.

2.0 SITE INVESTIGATION AND ACTIVITIES

This section presents a summary description of the site investigation activities that were conducted as part of the NUSC Disposal Area SASE. The sampling program for the SASE included collecting soil gas, surface water, sediment, surface soil, subsurface soil, and groundwater from several locations at the NUSC Disposal Area. Sample analytical results are presented in Section 4 of this report.

2.1 INTRODUCTION

The following sections detail the site investigation activities that were performed during the SASE. Sample locations are depicted on Figures 2-1 through 2-4. Photos of most sample stations are provided as electronic (*.JPG) files on CD-ROM, included as Appendix A of this report. Field documentation for the site activities are provided in Appendix B.

The investigation was performed in phases, allowing for available results and observations from each previous phase to be used during the implementation of the next phase. Results were used to characterize the nature and extent of site-related environmental contamination.

Specific Standard Operating Procedures (SOPs) were used as described in the Work Plan for Study Area Screening Evaluation NUSC Disposal Area, Naval Education and Training Center, January 1998 (Brown & Root Environmental, 1998) revised June 2003 (TtNUS, 2003). Alpha Analytical Laboratories was selected as the analytical laboratory.

As part of this site investigation, the following tasks were performed:

Phase I

- Records Search and Reconnaissance Survey
- Passive Soil Gas Survey

Phase II

- Surface Water and Sediment Sampling
- Evaluation of Ecological Setting
- Test Pit Excavation and Soil Sample Collection

Phase III

- Geologic/Hydrogeologic Investigation
- Land Survey

Table 2-1 presents a summary of samples collected during the performance of these tasks.

2.2 PHASE I ACTIVITIES

Phase I activities were performed from June 5, 2003 through July 18, 2003.

2.2.1 Records Search and Reconnaissance Survey

An initial records search was conducted in 1997 during development of the SASE Work Plan for this site. Prior to initiating the field investigation in 2003, a new records search to determine site boundaries, history of operation, history of nearby buildings and potential upgradient environmental contamination sources was conducted. The records search included a review of RIDEM, Navy and TtNUS data sources. Interviews and site visits with NUWC personnel, including a retired employee, were conducted based on their knowledge of prior activities at the site.

A site walkover was conducted on June 5, 2003 by the TtNUS field team members to familiarize themselves with site conditions. The site was visually surveyed with respect to access restrictions and sampling locations. Pertinent features, such as overhead and subsurface utilities, dense vegetation cover and other potential hazards, as well as base security protocol and associated contacts, were reviewed with Navy personnel with respect to planned sampling activities. Site-specific health and safety considerations, including emergency evacuation procedures, were also reviewed.

2.2.2 Passive Soil Gas Survey

Under this task, 33 passive soil gas samples (plus quality control samples) were collected and analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) using the Gore-Sorber® Screening Survey soil gas detectors. Potential VOC and SVOC contamination was detected in the vadose zone. This information was then used to adjust a number of sample locations for Phase II and III of the field investigation. Soil gas sample locations are depicted on Figure 2-1.

2.2.2.1 Soil Gas Sampling Procedure

An 800- by 800-foot sample grid was laid out on the site as shown in Figure 2-1. The grid was surveyed on June 25, 2003 and July 1, 2003 by Louis Federici & Associates, a subcontractor to TtNUS. At each specified sample location a pilot hole (1 to 2 inch diameter) was created to a depth of approximately 3 feet below grade using a rotary drill hammer. The sample depth was adjusted in the field to maintain the

collector above the water table (if possible) during the course of the investigation. The vendor-supplied passive soil gas sorbent collectors were inserted on July 1, 2003 and July 2, 2003 to the appropriate sample depth and the hole closed using a cork plug. The sorbent collectors were carefully handled at all times using analyte-free tools and gloves. On July 17, 2003, after a 14-day exposure period, the sorbent collectors were retrieved, sealed in their original containers, and returned to the vendor's laboratory for VOC and SVOC analyses. The passive soil gas analytes are listed in Appendix D.

2.3 PHASE II ACTIVITIES

Phase II activities, including surface water, sediment and soil sample collection were performed from July 28, 2003 through August 15, 2003.

2.3.1 Surface Water and Sediment Sampling

The objective of this effort was to assess the presence and nature of potential surface water and sediment contamination at selected locations near the NUSC Disposal Area.

A small stream, locally referred to as Deerfield Creek, flows into the site along the southern boundary and joins an unnamed stream which flows from the east of the site. The streams discharge to the NUWC Pond located along the northwestern perimeter of the site. Nine surface water and sediment locations were sampled within the NUWC Pond and the two tributary streams. The samples were collected and the locations were marked with grade stakes and surveyed. The locations are presented on Figure 2-2.

The temperature, pH, specific conductance, dissolved oxygen, oxidation reduction potential (ORP), and turbidity of the surface water at each sample location were measured using a Horiba U-22 water quality meter and recorded. Sediment samples were collected from the 0 to 6-inch interval, measured from the sediment surface. The pond locations (SW/SD07, SW/SD08 and SW/SD09) required the use of a small boat for sample collection. As required by water depth, a Kemmerer sampler was used for surface water sampling and a clamshell sampler (ponar) was used for sediment sample collection for locations SW/SD08 and SW/SDO9. For all other locations, stainless steel hand tools (e.g. scoops) were used to collect sediment samples and surface water samples were collected by dipping the appropriate sample container directly into the water. Surface water and sediment samples were collected in a downstream to upstream order and in accordance with the procedures outlined in the Work Plan.

The surface water and sediment samples were analyzed for full Target Compound List (TCL) organics (VOCs, SVOCs, pesticides/polychlorinated biphenyls (PCBs)) and Target Analyte List (TAL) metals. In addition, surface water samples were analyzed for dissolved metals while sediment samples were

analyzed for total organic carbon (TOC), acid volatile sulfide/simultaneously extracted metals (AVS/SEM), and grain size distribution.

2.3.2 Evaluation of Ecological Setting

An evaluation of the ecological setting was conducted to assist the development of a list of potential ecological receptors. A visual screening characterization was performed by a qualified ecologist. The evaluation included: 1) the identification of the types and spatial extent of habitats that were present on and around the site, with special focus on natural habitats; 2) the identification of the wildlife species and biological communities on and adjacent to the site that may use these habitats and that may be potential receptors with regard to site-related contaminants present in surface soils, surficial sediments, and surface water; and 3) the identification of on-site and adjacent wetlands, their approximate boundaries and relative location to the site.

To provide a basis for identifying potential ecological receptors, the nature and composition of animal and plant communities at the site and in the surrounding area were identified. The marine ecosystem downstream of the site was not evaluated at this time.

A literature review was conducted to provide background information on the terrestrial habitats and species of plants and animals expected to occur on the site and in proximate areas; and to provide information on the potential use of the general area by migrating or over-wintering species. The review included RIDEM, US Fish and Wildlife Service (USFWS), and TtNUS data sources. In addition, lists from the RIDEM and USFWS Office of Endangered Species were reviewed by TtNUS to identify endangered, protected or threatened species that may inhabit or use the Newport area and the environments associated with the site.

Field assessments were conducted in accordance with the Work Plan. Findings of the ecological characterization are provided in Section 4 of this report.

2.3.3 Test Pit Excavation and Sample Collection

Test pit excavation was performed August 11, 2003 through August 15, 2003 by Mill City Environmental Corporation, a subcontractor to TtNUS and supervised by a TtNUS representative.

Test pits were excavated in suspected areas of disposal as indicated by aerial photography, by ground conditions, and in areas of possible VOC contamination as indicated by the soil gas survey. Sixteen test pits were excavated to identify the presence and extent of wastes and other debris, and to collect soil

samples for laboratory analysis. Excavated test pit locations are depicted on Figure 2-3. Approximately three samples were collected from each test pit, for a total of 43 soil samples collected and submitted for laboratory analysis. Analyzed samples are listed on Table 2-1.

A number of the test pit excavations were proximal to Deerfield Creek, the unnamed stream, NUWC Pond and wetland areas and fell within the Rhode Island Freshwater Wetlands Act jurisdiction. The Rhode Island Department of Environmental Management (RIDEM) Department of Water Resources was notified of the work to be performed, and their concerns were addressed prior to initiation of work. Impacts to these sensitive areas were minimized to the greatest extent possible. Erosion and sedimentation control measures were installed at each test pit location which had the potential to impact sensitive environments. Final test pit locations were approved by a RIDEM representative on site.

2.3.3.1 Test Pit Excavation

A total of 16 test pits were excavated and are presented on Figure 2-3. Test pit locations were originally planned for suspected disposal areas based on a review of aerial photographs. However to further refine the test pitting activities, some locations were relocated based on soil gas survey results and direct field observations. Prior to excavation, the general areas planned for test pit activities were inspected in attempt to identify areas of potential waste disposal such as debris on the ground surface, soil mounds, and stressed vegetation. Where identified, test pits were excavated in these areas. Four test pit locations were relocated to target areas of confirmed VOC and/or SVOC contamination as determined by Phase I soil gas survey results. In areas where field observations did not identify potential disposal locations, the test pits were excavated in areas of probable fill or disposal as identified in aerial photographs. Table 2-2 presents the test pit locations and the purpose for the excavation.

All test pits were excavated to the water table if encountered within 15 to 18 feet below grade (maximum reach of excavator) or were stopped because bedrock was encountered. Excavations were also terminated if the walls of the trench did not maintain their structure.

In one case, TP02, excavation was terminated above the water table to prevent cross contamination of the groundwater after visible waste, including drums and oily materials, were encountered in the subsurface soil.

The excavated material was returned to the pit and backfilled to the original grade. Obvious forms of contamination (drums, liquid tar, etc.) were separated and disposed of appropriately. Two opposite corners of each test pit were staked and surveyed.

All test pit locations were photographed and videotaped during the investigation activities. Photographs were taken prior to the excavation and of each pit side-wall after completing the excavation activities. The photographs were recorded and logged and are presented in Appendix A. They include the photograph number, test pit number, date, location of photographer, direction of view, and the subject (e.g. "west side-wall").

There is no TP03 or TP04. Five test pits planned to be excavated in the paved area as outlined in the Work Plan were not excavated and were replaced with Direct Push Technology (DPT) soil borings as described in Section 2.4.

2.3.3.2 Sample Collection from Test Pits

Soil samples were collected from test pits in accordance with the Work Plan. A minimum of three soil samples were collected from each test pit. An additional sample, for a total of four samples, was collected from TP02 based on field observations and a request from RIDEM to target a specific area of visible contamination. Only two samples were collected from TP09 and TP10 and one sample from each test pit, TP12A and TP12B due to the shallow depth below ground surface of bedrock.

Soil samples were analyzed for full TCL organics (VOCs, SVOCs, pesticides, PCBs), TAL, metals, and GRO/DRO (using Method 8015B modified for C-9 through C-36 hydrocarbons). Samples were containerized in the following order: VOCs/GRO/percent moisture, SVOCs, pesticides/PCBs, TAL metals, and DRO.

In addition, a flame ionization detector (FID) monitoring instrument was used to conduct headspace screening for VOC compounds. A photoionization detector (PID) was available to verify positive results on the FID due to potential methane interference with an FID. The jar headspace screening was conducted in accordance with the Work Plan.

2.4 PHASE III ACTIVITIES

Phase III activities, including geologic and hydrogeologic investigations, were performed August 18, 2003 through September 10, 2003.

2.4.1 Geologic/Hydrogeologic Investigation and Soil Sampling

The objective of the geologic and hydrogeologic investigation was to evaluate the presence of soil and groundwater contamination resulting from historical activities at the site. Chemical data was collected to assist in making preliminary determinations on the presence of contaminants in the two media.

The subsurface exploration program addressed the areas of concern identified during the IAS, targeted areas of confirmed soil gas contamination as determined by the soil gas screening survey results, and was expanded to adequately characterize other areas of potential waste disposal identified in aerial photographs of the study area. Test pits where contaminants were suspected to be leaching into the groundwater based on field observations, and locations of elevated VOC headspace screening results were targeted. Modifications to the number and location of borings/wells were discussed prior to and during field operations and Field Modification Records (FMRs) were completed to document rationale for changes. Soil borings and well locations are presented on Figure 2-4.

Eleven (11) soil borings were installed and four (4) bedrock monitoring wells (MW01B through MW04B) were installed in the study area to investigate potential releases of contamination to soils and groundwater and to characterize subsurface lithology. Table 2-3 describes the location, the screened interval, and the purpose of each of the wells installed.

2.4.1.1 Advancement of Borings

The advancement of soil borings was performed August 8, 2003 through September 5, 2003. A total of 15 soil borings were advanced using either a conventional Mobile B-59 drill unit or a GeoProbe® model 6610 DT direct push drill rig.

A 4.25-inch inside-diameter hollow-stem auger was used to create a pilot hole prior to advancing four boreholes with 3-inch (nominal) casing. A 2-foot-long, split-barrel sampler was used to collect cores of soil material in 2-foot intervals, from the ground surface to a required depth or refusal. Split-barrel samplers were advanced following general procedures specified in ASTM-D-1586-99 (Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils). Standard penetration tests were not conducted during advancement of each boring; however, blow-counts were reported to the TtNUS site representative and recorded on the boring logs.

A total of 11 soil borings were advanced to a required depth or refusal using a GeoProbe® Soil Probing Hammer. Surface and subsurface soil samples were collected with a GeoProbe® Macro-Core® piston

rod soil sampling system. The Macro-Core® samples consisted of a 1.5-inch inside diameter, 5-foot long core barrel with a clear plastic liner.

Soils were described according to the Unified Soil Classification System, and logged to provide a complete lithologic record of the subsurface materials. The boring logs are provided in Appendix B for reference. As each split-barrel or Macro-Core® sampler was opened, the soils were monitored for organic vapors using an FID and a PID. Headspace screening was conducted as described in the Work Plan. The borehole and the breathing zone of the field crews were periodically monitored for organic vapors, in accordance with the site specific Health and Safety Plan (B&R Environmental, 1997).

Eleven borings (SB01 through SB11) were advanced through overburden and into weathered bedrock using direct push technology (DPT). Several overburden wells were planned for installation; however, no groundwater was encountered in the overburden soil. Based on these conditions, no overburden wells were completed. Once soil sampling was completed, all of the overburden boreholes were backfilled. Of the 11 borings, five were drilled in the paved area (SB01 to SB05) in lieu of proposed test pits. This modification was discussed with RIDEM and EPA prior to drilling operations and a field modification report was submitted to regulatory parties.

Four borings (MW01B through MW04B) were advanced into bedrock, cored, and subsequently converted into monitoring wells. Table 2-3 describes the screened interval for each of the wells. The bedrock monitoring wells provide bedrock aquifer water quality information. Bedrock drilling was continued to a maximum of 40 feet below top of rock to locate water-bearing fractures. Bedrock cores provided an initial characterization of the nature of bedrock fracturing and potential contaminant transport in the bedrock. Rock coring was performed with standard NX double-wall core barrels that provided a nominal 2-inch core and a 3-inch diameter borehole. The bedrock cores were logged by the rig geologist at the completion of each core run. Bedrock cores were described using standard rock description methods. Rock Quality Designation (RQD) was calculated.

As described in the Work Plan, drill cuttings were containerized and sampled for waste characterization and sampling equipment and drilling apparatus were decontaminated.

Drilling fluids were changed after reaching bedrock, to eliminate the potential for cross contamination of aquifers.

2.4.1.2 Soil Sampling

A total of 22 soil samples were collected from soil borings SB01-SB08 and MW04B. Soil samples were not collected from borings SB09-SB11 since they were located within 20 feet of a test pit. Three soil samples were collected from each of the soil borings, SB01-SB05, which were drilled in place of test pits in the paved area. Two soil samples, one from the 0- to 1-foot interval and one from just above the water table (2-foot interval) as determined in the field, were collected from SB06 and SB08. Only one soil sample was collected from SB07 due to the presence of shallow bedrock at approximately 2 feet below grade. Two soil samples were collected from MW04B at depths below the maximum depth of the test pit (TP01) that was in the same location. Where signs of potential contamination (e.g., odors, stains, sludges) were observed at a depth between the two planned sampling intervals, the second sample was instead collected from the depth of greatest observed contamination (i.e., most stained or highest headspace screening results) below the surface interval. VOC headspace screening was performed on each sample as described in the Work Plan.

Appropriate chain-of-custody procedures were followed as described in the Work Plan and samples were labeled, packaged and shipped according to TtNUS SOP No. SA-6.1.

All collected soil samples were analyzed for full TCL organics (VOCs, SVOCs, pesticides, PCBs), TAL metals, and gas range organics/diesel range organics (GRO/DRO) (using Method 8015B modified for C-9 through C-36 hydrocarbons). Samples were containerized in the following order: VOCs/GRO/percent moisture, SVOCs, pesticides/PCBs, TAL metals, and DRO.

2.4.1.3 Groundwater Monitoring Points

As part of the geologic/hydrogeologic investigation, four bedrock monitoring wells were installed. No water was encountered in the overburden at the time of drilling; therefore, no shallow overburden wells or microwells were installed as described in the Work Plan. The location of each well installation is presented on Figure 2-4. The purpose of each installation is presented in Table 2-3.

The four monitoring well locations were selected to evaluate potential contamination to groundwater, based on findings from other investigative efforts described in this report. No hydraulically upgradient wells were installed as part of this investigation. Data from wells previously installed by TRC Environmental Corporation, just south of the site, were available for evaluation of upgradient groundwater quality conditions (TRC, 1999).

2.4.1.4 Groundwater Monitoring Well Screen Installation

The wells were screened in rock. Table 2-3 describes the location, the screened interval, and the purpose of each of the bedrock monitoring wells installed.

Well screens and sandpacks used for the bedrock well installations were sized in accordance with the geologic formation at each boring location. Based on field observations, well screens with slot sizes of 0.010 (0.25 mm) and No. 2 sand (approximately US Sieve Size 20 (0.85 mm)) filter packs were installed. The well construction logs are provided in Appendix B.

The bedrock well screen was set based on conditions of bedrock determined by examination of the rock core. Based on field observations, the well screens were extended the entire length of the core runs due to the weathering condition of the bedrock. A filter pack extending from the bottom of rock to the top of rock was installed and then sealed with bentonite. The area around the remaining riser was then backfilled with bentonite chips and covered with a sand drain layer.

The horizontal and vertical locations of the wells were surveyed following the completion of well construction. A marked edge of the top of the PVC well riser was used as a permanent reference point.

2.4.1.5 Stream Drive Point Installation and Data Recording

In addition to the installation of monitoring wells for groundwater sampling and elevation measurements, nine drive points were installed for groundwater elevation measurements adjacent to the two streams and NUWC Pond at the surface water/sediment sampling locations (with the exception of the two central pond locations), as described in the Work Plan. The drive point measurements and the adjacent surface water level measurements indicate whether the stream and pond are "gaining" or "losing" surface water. Water levels were measured from the drive points and surface water stations at times concurrent with groundwater elevation measurements at the monitoring wells.

The drive points consisted of a steel pipe, which was vibrated and hammered into the ground using a small slide hammer. The end of the steel pipe had well screen slots (0.015 inches) along the long axis of the leading pipe section. The vibrating and hammering allowed for deep and quick penetration of the pipe into the ground. The process formed a tight seal which did not require installation of a grout seal.

During the groundwater sample collection (Section 2.4.1.7), the surface water and groundwater elevations were collected at the surface water stations and drive point locations, respectively. The distance (elevation) from the top of the drive point to groundwater and surface water (outside of the drive

point) was measured to the nearest 0.01 foot. Ground elevation of the drive point and horizontal location were surveyed during land surveying activities as described in the Work Plan.

2.4.1.6 Well Development

Wells were developed using a Waterra pump, as determined by the field geologist. Fine-grained material around the well screen was drawn into the well and removed by agitating the well water with a foot valve and simultaneously pumping water from the well at a discharge rate of approximately 0.5 gallons per minute. To prevent cross contamination between the wells, new polyethylene tubing was used in each well. Water produced during well development was containerized in 55-gallon drums (DOT Specification 17E), as described in the Work Plan.

The groundwater extracted from each monitoring well during development was monitored for the following water quality parameters: pH, temperature, oxidation reduction potential (ORP), specific conductance, dissolved oxygen, and turbidity at 15-minute intervals using a Horiba U-22 water quality meter. Development continued until pH, temperature, and specific conductance had stabilized and turbidity was equal to or less than 10 nephelometric turbidity units (NTUs). The well was considered stable when consecutive readings differed less than 10 percent.

Three of the four wells (MW01B, MW02B, and MW03B) were not considered stable after 4 hours of purging. Per authorization of the TtNUS project manager, well development was stopped after 4 hours.

At the request of RIDEM, headspace screening readings were taken from different intervals in each well during well development. The well was purged, the water quality parameters recorded and then a jar was filled with purge water, capped with foil and allowed to sit for 15 minutes before an FID and PID reading of the headspace was collected. The readings were recorded and used in combination with identified fracture intervals in the rock cores (Appendix B) to determine the pump intake interval for groundwater sampling.

2.4.1.7 Groundwater Sample Collection

Investigations of groundwater quality have not previously been conducted at this site. One round of groundwater samples were collected from each of the four newly installed monitoring wells as part of this investigation using the EPA low-flow purging and sampling procedure, as described in the Work Plan.

Groundwater samples were analyzed for full TCL organics (VOCs, SVOCs, pesticides, PCBs), TAL metals and dissolved metals.

Appropriate chain-of-custody procedures were followed and samples were labeled, packaged, and shipped according to TtNUS SOP No. SA-6.1 and as described in the Work Plan.

2.4.1.8 Non-Aqueous Phase Liquids (NAPL) Sampling

No light or dense non-aqueous phase liquids (LNAPL or DNAPL) were determined to be present in the monitoring wells. An aliquot was collected by using a bailer to further determine the presence of LNAPL in each of the monitoring wells. In addition, the immiscible liquid interface probe was used to determine the presence of DNAPL. No samples of LNAPL or DNAPL were collected.

2.4.1.9 Land Survey

Following the investigative work, a survey was performed by a State of Rhode Island licensed surveyor to identify horizontal locations of sample points, and other significant features identified during the investigation.

The base map presented in the Work Plan (Figures 3-1 through 3-3) was used; however, locations of existing buildings and study area boundaries were confirmed by survey.

The survey was conducted to establish relative locations of sample points. Survey control was maintained by tying into either the State of Rhode Island or United States Geological Survey (USGS) grid systems. Elevations were referenced to a USGS benchmark and the Navy mean low water level. Horizontal and vertical measurements were made relative to on-site control points.

All surveyed features were horizontally located to within +/-0.1 foot. Tops of PVC well risers and drive points were located to plus or minus 0.01 foot vertically.

The following points required location surveying:

- Test pit locations (two opposing corner points for each test pit).
- Boring locations, drive point locations and monitoring well locations and elevations.
- Surface water and sediment sample locations, surface water stake marker elevations.
- Soil gas sampling locations (determined by the grid set up as part of Phase I activities).

Survey data are provided in Appendix C.

2.5 INVESTIGATION-DERIVED WASTE (IDW)

Waste materials that were generated during the field investigation include drill cuttings and fluids, well purge and development water, decontamination fluids, wash water from power washing and poly sheeting. The uncovered drum containing a tar-like substance was overpacked.

Containers of IDW were labeled as to their point of origin, and date collected. Samples of these materials were labeled with the information on the containers.

Excess drill cuttings, discarded sample material, and other soil wastes were containerized.

Laboratory analysis of samples collected during the investigation program was used to further characterize the waste materials, as required by state and federal disposal requirements.

Decontamination fluids, well purge and development water, and drilling fluids were initially contained in 55-gallon drums. These materials were combined at the conclusion of the project and shipped off site for disposal in accordance with RIDEM, USEPA, and DOT Regulations.

2.6 DECONTAMINATION PROCEDURES

The equipment decontamination procedures described in TtNUS SOP SA-7.1 were followed in accordance with the Work Plan.

3.0 SITE CONDITIONS

This section presents a description of the physical conditions found during the field investigation activities performed as described in Section 2. The analytical laboratory results from collected samples are presented in Section 4 of this report.

The discussions presented in this section are supported by field documentation including boring logs, test pit logs, groundwater measurement data sheets and other information provided in Appendices B and C of this report.

3.1 BASIC SITE CONDITIONS

The site can be divided into seven major areas as described in this section. These areas are depicted on Figure 3-1 of this report.

North Meadow
South Meadow
Paved Gated Storage Area
Paved Open Storage Area
Deerfield Creek and Wetlands
Unnamed Stream
NUWC Pond (Deerfield Pond)

The north and south meadows are so designated as they are currently level and open from large vegetation. NUWC personnel indicated that these areas were periodically mowed up until approximately 2000. The north and south meadows are separated by the unnamed stream that flows in from the north east, and the Wanumetonomy Golf Course.

There is a large paved area to the south end of the site, and this is divided into two subsections. One is a storage area that is secured by chain link fencing and gated (Paved Gated Storage Area), and the other is open to traffic (Paved Open Storage Area). Both paved areas are used for large materials storage, including storage crates, boxes, jigs, molds and buoys. In the open storage area, a large steel jig is standing, approximately two stories in height, constructed on concrete footings and stayed with steel cables.

The north and east boundary of the site contains an access road that is used for fence patrol. The roadway is unpaved one lane wide and covered with crushed stone. The south and west boundary of the

site is presumed to be Deerfield Creek, and the pond that it feeds. The Deerfield Creek, pond and wetlands are described in detail in Section 3.5 of this report.

The topography is such that the surface gradient is down to the northwest. The Deerfield stream, the wetlands and the pond form a steep valley from the leveled meadow areas described above. Figure 3-1 presents the topography of the area as determined by a photogrammetric evaluation of aerial mapping information collected in 1996. The site appears to lie adjacent to an historic valley that was filled or leveled from east to west, providing usable storage areas.

3.2 HYDROLOGY

Surface hydrology at the site is dominated by two streams that converge at the site and form a low wetland and pond. These are referred to as the unnamed stream, the Deerfield Creek and the NUWC, or Deerfield Pond (Figure 3-1).

The NUWC Pond is a man-made freshwater pond formed in a basin area at a significantly lower elevation than the northeastern and southwestern uplands that form its two sides. The impoundment area varies from approximately 1 to 2 acres depending on the amount of surface water availability. During heavy rainfall events or spring melts the open water portion of the pond expands and extends into the lowlands at the south end of the pond. These lowlands include wetland and stream habitat that is typically vegetated and not characterized as open water habitat.

A concrete dam and spillway are present at the northern end of the pond. The water that enters spillway flows through an underground pipeline that eventually discharges to Narragansett Bay in the vicinity of the McAlister Point Landfill. During major storm events, water has overflowed the dam headwall and flowed downhill in a northwesterly direction to a low-lying area. This low-lying area has a surface inlet that feeds into the storm drain system that discharges to Narragansett Bay.

The pond ranges in depth from approximately 10 feet (when measured from the top of the concrete dam) to less than 1 foot in depth at the southern end. The water in the pond has historically been used by the Wanumetonomy Golf Course as a source of irrigation water. During periods of high use, the water has dropped to approximately 3 feet (elevation of pump intake) in depth at the dam. The pond is classified as open water habitat with a narrow and sporadic fringe of emergent vegetation along the pond edge. A more significant density of emergent wetland vegetation is located at the southern end of the pond. Near the dam, the pond substrate consists of organic mucky silt with some sand. The pond substrate gradually increases in sand content in the direction of the stream outlets at the southern end of the pond.

Water flows into the pond from Deerfield Creek from the southwest and an unnamed stream from the Wanumetonomy Golf Course to the east (Figure 3-1). In addition, storm water is discharged to the basin through outfalls from the NUWC facility storm drain network from the west. The two streams are generally shallow (ranging from a few inches to 20 inches in depth) and typically range from 2 to 4 feet in width. The stream substrates are a combination of boulder, cobble, gravel and sand. It is apparent, based on field observations, that there are high flow conditions in the stream channels that have scoured and removed much of the fines from the streambeds. The fines have been deposited in the low gradient end of the streams and pond.

3.3 GEOLOGIC CONDITIONS

The regional and site specific geological conditions are presented in the following subsections.

3.3.1 Regional Geology

NAVSTA Newport (and the NUSC Disposal Area) is located at the southeastern end of the Narragansett Basin. This basin is a complex, synclinal mass of Pennsylvania-aged, non-marine sedimentary rocks which chiefly include conglomerates, sandstone, shale, and anthracite. Many folds and some faults occur throughout the basin, but the character and amount of folding and faulting are not clearly defined.

The bedrock of the Narragansett basin has been divided into the following five units: The Rhode Island Formation, Dighton Conglomerate, Wamsutta Formation, Pondville Conglomerate, and Felsite at Diamond Hill. At NAVSTA, and most of the surrounding area, the bedrock is entirely of the Rhode Island Formation.

The Rhode Island Formation is the most extensive and thickest of the Pennsylvania formations in Rhode Island. Included within the Rhode Island formation are fine to coarse conglomerate, sandstone, graywacke, arkose, shale and small amounts of meta-anthracite and anthracite. Most of the rock is gray, dark gray, and greenish, but the shale and anthracite are often black. Crossbedding and irregular, discontinuous bedding is characteristic of the formation. In the southern portion of the basin, such as at NAVSTA, rocks of the Rhode Island Formation are metamorphosed, and typically include phyllite, quartz-mica schist, feldspathic quartzite, garnet-staurolit schist, and some quartz-mica-sillimanite schist. Additionally, few areas of thick conglomerates within the Rhode Island Formation have been found in the southern part of the basin. These conglomerate layers consist of pebbles, cobbles, and boulders, interbedded with sandstone and graywacke, and are gray to greenish in color. This stones are predominantly quartzite and have been elongated as a result of tectonic forces in the southern portion of the basin.

Overlying the bedrock of the Narragansett Basin are surficial deposits of Pleistocene sediments. These sediments owe their origin to the Wisconsin glaciation which covered the area with ice several thousand feet thick. As the glaciers receded, they deposited unconsolidated glacial materials of variable thicknesses throughout the Narragansett Basin area. The glacial deposits are primarily comprised of till and outwash. The glacial till consists of a poorly sorted mixture of sand, gravel, silt, and boulders, whereas glacial outwash consists of stratified deposits of sand, gravel and cobbles laid down by streams as the glaciers melted.

3.3.2 Site Geology

As part of the site investigation, some of the objectives were to characterize the nature of the geologic materials beneath the site and to identify potential preferential contaminant pathways within these materials. The geologic investigation included:

- Excavating test pits
- Advancing soil and bedrock borings
- Installing bedrock monitoring wells and stream drive points

The data gathered from these activities indicate the site is underlain by fill and three geologic units: a silt and sand unit with varying amounts of gravel, a glacial till unit, and fractured bedrock. Groundwater within the bedrock appears to flow southeast to northwest, with local control towards the stream valley.

Characterization of the geologic units focused on the nature of the unconsolidated materials, the description of the bedrock, and the identification of potential preferential contaminant pathways in various units. Geological and hydrogeological information was gathered from the excavation of test pits, the advancement of soil borings, and the installation of monitoring wells during the site investigation, as well as from past subsurface investigations that were conducted in the vicinity of the NUSC Disposal Area. As discussed in Section 2 of this report, a total of 16 test pits, 11 soil borings, and four bedrock monitoring wells were completed for the SASE. Figure 3-2 presents a geologic cross-section orientation map as well as three geologic cross-sections through the site. These sections were prepared based on these field investigations. Appendix A presents photos of test pits that were completed to provide an understanding of the overburden stratigraphy. Appendix B presents test pit logs, boring logs, and well construction logs summarizing the geologic materials that were identified in each test pit and drilling location during the completion of the SASE.

The overburden geology beneath the NUSC Disposal Area consists of fill and two unconsolidated geologic units: a silt, sand, and gravel unit; and glacial till. Overburden thickness ranges from approximately 2 feet (TP09, TP12B, SB07, North Meadow) to 15 feet (MW04B, South Meadow).

Fill materials overlie both of the unconsolidated units across the southern portions of the site where past disposal operations filled low-lying areas or grading operations reworked the upper few feet of soil for development purposes, such as the Paved Storage Areas. Fill materials primarily consist of construction debris (asphalt, brick, clinkers, concrete blocks, slabs and curbing with rebar, corroded 55-gallon drums and 5-gallon containers with tar-like contents, fiberglass, mesh screens, metal cans, pipes, and strapping, nails, plastic, rubber hoses, steel cables and frames, and wire) and/or natural soil or rock (silt, sand, gravel, and weathered bedrock fragments). Fill soils were difficult to visually distinguish from native soils. In the absence of debris, fill soils appeared to consist of road base materials beneath asphalt or loose soil above a sandy silt/silty sand layer.

Fill materials were encountered in all of the test pits and soil borings in the South Meadow (TP01, TP02, TP05 through TP08, TP15, TP15A, SB09, SB10, MW01B, and MW04B); two test pits on the southern-most extent of the North Meadow (TP10 and TP12A and TP12B), and one test pit adjacent to the Paved Open Storage Area, above Deerfield Creek (TP14). Test pits were not excavated in the Paved Storage Areas. Rather, soil borings were advanced in these areas as an approved suitable alternative. Fill materials were observed in soil borings SB01 through SB06, and SB08 in the Paved Storage Areas and their immediate vicinity. Across the site, fill thickness ranges from approximately 0.5 feet (TP10 and TP12B) to 15 feet (MW04B). The majority of fill materials were observed beneath the South Meadow and both of the Paved Storage Areas. No fill materials were noted in test pits TP09, TP11, TP12, TP13, or soil borings SB07 and SB11 (North Meadow).

A unit of silt and sand with variable amounts of gravel was encountered in test pits and soil borings in the North Meadow (TP09, TP11, TP12, TP12B, TP13, SB07, and SB11); beneath the fill in the South Meadow (TP06); the Paved Gated Storage Area and its immediate vicinity (SB01 through SB04 and SB06); and the Paved Open Storage Area (SB08). This unit consists of brown to gray brown fine-grained deposits of silt; fine-to-coarse grained deposits of silty sand, sand, gravelly sand; and coarser deposits of silty sandy gravels, cobbles, and boulders. Composition of the unit is variable. Its thickness across the site ranges from approximately 1.5 feet (TP12B, North Meadow) to 8.5 feet (SB04, Paved Gated Storage Area).

A dense, heterogeneous mixture of clay, silt, sand, coarse subangular to angular gravel, cobbles, boulders, and rock fragments was encountered beneath the silt and sand unit and above bedrock in some areas. This material was characterized as possible till. It was observed in test pits and/or borings in the

North Meadow (TP10 and TP12); the South Meadow (TP05, TP06, and SB09); the Paved Gated Storage Area and its immediate vicinity (SB01 through SB04); and the paved Open Storage Area (SB08). This lower layer appears to be discontinuous across the site and ranges from approximately 0.5 feet (TP06, South Meadow) to 5.5 feet thick (SB03, east side of Paved Gated Storage Area).

Bedrock was encountered in test pits and soil borings across the site. As part of the site investigation, four additional borings (MW01B through MW04B) were advanced into bedrock and cored. Each core hole was subsequently completed as a monitoring well, screened in bedrock. Bedrock cores were obtained from three of the four core holes (MW01B, MW02B, and MW04B). At MW03B, a fracture was intersected approximately 5 feet below the top of rock. All drilling water was lost into the formation as the core barrel was advanced through the 8-10 foot interval. No rock core was recovered, indicating a large fracture zone in this interval. A roller bit was used to advance through the weathered rock for the purpose of creating a void for the installation of a monitoring well at MW03B.

The depth to bedrock varies from approximately 2 feet (TP09, TP12B, SB07, North Meadow) to 15 feet below grade (MW04B, South Meadow). Bedrock elevations, as shown on Figure 3-2, indicate that the bedrock surface dips towards the stream valley occupied by Deerfield Creek, the Unnamed Stream, and NUWC Pond (Deerfield Pond).

Bedrock core samples indicate the site is underlain by a light to dark-gray colored, fine-grained metamorphosed rock, characterized as slate/phyllite. Interbeds of quartz schist were noted in the rock cores from MW02B and MW04B. A pitted texture was observed in both of the rock units at various depths. The resultant pits or the fractures along the phyllite/quartz schist contact may serve as a preferential contaminant pathway.

The upper 5 feet of bedrock is significantly weathered and degraded. It is easily crumbled with slight finger pressure. The rock quality classification for this interval is very poor based on rock quality designation (RQD) values of less than 25 percent. Iron-oxide stains were prevalent on the surfaces of fractured pieces. At MW03B, approximately 250 gallons of drilling water were lost into the formation as the core barrel was advanced through the 8-10 foot interval. The bedrock surface at this location is fractured and may represent a preferential groundwater and contaminant pathway.

The bedrock in the depth interval between 5 and 25 feet below the top of rock appeared to be less weathered and degraded than the upper 5 feet. However, the rock quality classification is very poor to poor based on RQD values of less than 25 percent or 25 to 50 percent, respectively. One-to two-foot thick zones of soft, degraded phyllite were noted in MW01B (13-15 feet and 18 feet below top of rock) and MW02B (23 to 24 feet below rock). Fractures were observed to be in horizontal, low-angle, high

angle, and vertical orientations. Small volumes of drilling water were lost into the formation, potentially through the intervals of soft degraded rock or fractures in MW02B (6 to 20 feet below rock) and MW04B (5 to 10 feet, 15 to 20 feet, and 23 feet below top of rock). Iron-oxide stains were not as abundant in core samples retrieved from 5 to 25 feet below the top of rock as they were in the upper portion of the bedrock core. Interbeds of quartz schist were observed in the core from MW02B (8 to 10 feet below rock) and MW04B (12 to 22 feet below rock). Cores with the quartz schist generally had higher RQD values than the phyllite.

Based on the recovered core samples from MW01B and MW02B, bedrock is characterized by fewer fractures and less evidence of iron-oxide stains at depths of 25 feet or more below the rock's surface. Bedrock at these depth intervals is more competent than the weathered bedrock in the upper zones. RQD values increased to approximately 68 percent and 29 to 40 percent in cores from MW01B and MW02B, respectively. These values are equivalent to poor (25 to 50 percent) and fair (50 to 75 percent) rock quality classifications. Horizontal fractures and a 1-foot thick interval of soft, degraded phyllite were noted in MW02B at approximately 27 to 28 feet below rock. Higher angle fractures were observed at approximately 32 to 33 feet and 40 feet below rock. Small volumes of drilling water were lost into the formation at these depths. At MW04B, the bedrock in the depth interval between 25 and 30 feet below the top of rock is weathered and degraded. The rock quality classification is very poor.

3.4 REGIONAL AND SITE-SPECIFIC HYDROGEOLOGICAL CONDITIONS

The regional and site-specific hydrogeological conditions are presented in the following subsections.

3.4.1 Regional Hydrogeology

The regional hydrogeology for the site is presented below. Much of this information was taken from TRC RI/FS work plan dated March 1993.

Groundwater on Aquidneck Island is obtained from the unconsolidated glacial deposits of till and outwash and from the underlying Pennsylvanian bedrock. Throughout the area, depth the groundwater ranges from less than 1 foot to approximately 30 feet, depending physical and temporal location. Average depth to groundwater is approximately 14 feet on Aquidneck Island, and moves from areas of high elevations to Narragansett Bay and the Sakonet River.

Groundwater at NAVSTA, which is on the western slope of Aquidneck Island, is shallow, less than 10 feet in most areas. Groundwater in this area generally flows west with topography into Narragansett Bay. Soils in this area have permeabilities that are moderate to rapid, and do not restrict vertical movement of

water. Due to the highly fractured nature of the Pennsylvanian bedrock in this area, water in the bedrock aquifer likely follows a generalized east to west path.

The RIDEM has established a state groundwater classification system to protect its groundwater resources. The groundwater at the NUSC disposal area site is classified as GB (RIGIS, 1997), although the groundwater at the property abutting the site to the north (across gradient) is GA. Groundwater classified as GB may not be suitable for drinking water without treatment, because of known or presumed degradation. Groundwater classified as GB is typically located at highly urbanized areas in the vicinity of disposal sites for solid waste, hazardous waste, or sewerage sludge.

3.4.2 Site Specific Hydrogeology

Hydrogeologic conditions at the NUSC Study Area were evaluated through groundwater gradients and surface water elevation measurements, and through a preliminary evaluation of the hydraulic conductivity of the wells installed.

3.4.2.1 Groundwater Gradient

A network of groundwater measurement points were used to develop a map of the surface gradient of the groundwater at the site. Measurement points included groundwater monitoring wells and steel hand-driven points. Groundwater wells at this site were all completed in bedrock, as described in Section 2 and Section 3.3 of this report. Drive points consist of 1 foot slotted steel monitoring points attached to solid steel risers driven into the ground a minimum 2 feet below ground surface. Drive points were installed in wetland areas, adjacent to the streams or ponds, in order to measure co-located groundwater and surface water elevations. Drive points and monitoring well installations are further described in Section 2 of this report.

Elevations of groundwater wells were measured by a professional land surveyor to a precision 0.01 feet. The elevations are measured by a reference point marked on the PVC well casing, inside the metal protective casing. Using the elevation reference point, groundwater depth is measured using an electronic detector, and corrected to the elevation of the measurement point.

Elevations of drive points were approximated measured by the height of the steel casing from the elevation of the ground surface at that station, identified by the surveyor to a precision of 0.1 feet. Using the measured reference point, groundwater elevation inside the steel casing, and (if available) the surface water elevation outside the steel casing were both measured using an electronic detector and corrected to the calculated elevation of the measurement point.

Water level measurements in groundwater wells and drive points are presented on Table 3-1. As this table shows, groundwater within the drive points where surface water was also present was equivalent or higher in elevation than the elevation of the surface water, indicating that the stream system was receiving water from the formation underneath at the time of the measurement. This observation is supported by the elevations of the groundwater in the monitoring wells being well above the elevations of the stream and pond nearby.

Groundwater elevations were mapped in order to depict the surface gradient of the groundwater. There are a number of difficulties mapping groundwater gradients in this manner, due to the need to combine surface water elevations and bedrock groundwater elevations, and due to the limited number of bedrock monitoring points. The interpreted groundwater gradient is depicted on Figure 3-3.

Based on the groundwater elevations measured and mapped on Figure 3-3, groundwater at the site appears to flow east to west (downgradient toward Narragansett Bay). The historic stream valley is likely to support this east to west gradient. This directional flow is also supported by the obvious surface gradient. However, this is a generalized flow map, assuming consistent and homogenous subsurface conditions in both bedrock (wells) and overburden (drive points). In actuality, such homogeneity is not possible in most situations, and there is an inherent margin of error in the interpretation of bedrock groundwater flow. Generalizations such as those depicted on Figure 3-3 do not reflect the sinuous path of groundwater through bedrock fractures, rather, they show an overall gradient through the aquifer.

In addition, conditions noted by geologists conducting bedrock borings and rock cores indicate that water is likely to be exchanged easily between bedrock and overburden. The highly fractured upper levels of bedrock, the degradation of that rock, the variability of the orientation of fractures within the rock as well as the discontinuous nature of the possible till layer all indicate that no natural barrier exists between the overburden and bedrock against water or contaminants.

3.4.2.2 Hydraulic Conductivity

Hydraulic conductivity was evaluated in a preliminary manner through measurement of falling head tests in the bedrock monitoring wells installed at the site. The falling head tests were conducted by injection of a known quantity of HPLC-Grade water into the wells, and measuring the time for the formation around the wells to absorb that water. Head measurements were made using automatic data loggers recording water levels every 0.5 seconds. Hydraulic conductivity was calculated for each well as shown on Table 3-2.

Hydraulic conductivity estimates are limited by the well construction, length of the screened intervals, and the test methods conducted. Estimates are made through mathematical models that assume that slug injection is instantaneous, which is not feasible with a large screen length, and particularly when using water for the slug. Since injection of the slug is not instantaneous, the values given by the calculation must be considered estimates. Data and calculations for hydraulic conductivity are presented in Appendix E.

For this site, the bedrock hydraulic conductivity is estimated between 1 foot per day (MW02B) and 5 feet per day (MW04B). Table 3-2 notes that MW03B showed an insufficient response to the injection of the slug (no change in head as water was added). As stated in Section 3.2, the geologist reported that while coring rock at this location, all the drilling water was lost into the formation as the core barrel was advanced through the 8-10 foot interval. No rock core was recovered from this interval, indicating a large fracture zone in this interval.

3.5 ECOLOGICAL CONDITIONS

This section provides a brief description of the ecological conditions and setting that is present in the site vicinity. A more detailed description of the ecological conditions is presented in the Ecological Habitat Evaluation Report in Appendix E.

The site can be physically characterized as an elevated stream embankment area (plateau) which borders the NUWC Pond to the west, Deerfield Creek to the southwest, and the golf course to the north/northeast. A second small unnamed stream also flows through the northern portion of the site, generally in an east-west direction. The unnamed stream originates from the golf course north/northeast of the site. This small stream joins with Deerfield Creek (the primary stream) west of the site and flows into the pond. The study area topography is highly variable, with topographic relief of approximately 15 to 20 feet from the northern to the southern portions of the site.

Vegetation on the site consists primarily of grasses, shrubs, saplings, and vines with some mature trees. The plateau-like area described above of the North and South Meadows is primarily an open grassland and scrub/shrub area and much of the stream valley basin has a dense scrub/shrub cover. Most of the mature tree canopy in the study area is present along the steep embankment of the stream valley and with sporadic trees within the stream valley basin.

Habitats dispersed throughout and adjacent to the site are characteristic of fragmented, developed landscapes of lightly industrialized/commercial areas in the New England region. Most of the immediate area precipitation flows towards the streams and pond and is eventually discharged to Narragansett Bay.

Approximately 30 percent of the study area is covered by pavement, with the remaining area providing some habitat value. Most of the study area is encircled by chain-link fence that separates it from off-site areas (golf course) except the unfenced western boundary along Cunningham Street.

The highly fragmented habitat, large open paved areas, chain-link fence around most of the study area, and the minimal quality habitat (NETC facility and golf course) surrounding the study area limit the range of terrestrial, wetland, and avian wildlife species expected to utilize the site. However, the dense vegetation in the basin and uplands in the area do provide cover, foraging, and breeding/nesting areas for birds, mammals, reptiles, and amphibians that do not require large home ranges. The pond and streams provide a local important freshwater source for wildlife. Additionally, migratory birds are expected to utilize this area for resting and foraging during migration.

4.0 CONTAMINANT DISTRIBUTION

This section presents an abbreviated evaluation of the contaminants found in samples collected as described above and in Section 2 of this report. A complete set of data collected is presented in Appendix F. At locations where the contaminant is detected between the instrument detection limit and the reporting limit, the result is estimated and flagged with a "J". At stations where the contaminant was not detected at the instrument detection limit, the reported value is stated as the value at the reporting limit, and flagged with a "U". Data validation details are presented in the data validation memoranda in Appendix G.

4.1 SOIL GAS CONTAMINANT DISTRIBUTION

Soil gas samples were collected and analyzed as described in Section 2 of this report. The vendor of the soil gas collection modules provided a graphic interpretation of selected contaminants detected in the soil gas samples, which is presented as Appendix D of this report. Contaminants were selected for the graphic interpretation presented in the report based on the concentrations detected and frequency of detection.

Three figures were developed by the vendor to show relative vapor concentrations of (1) trichloroethene (TCE), (2) BTEX, and (3) petroleum hydrocarbons, represented by undecane, tridecane, and pentadecane (Appendix D). The extent of the detections presented in the figures in Appendix D indicate low soil gas mass levels in isolated "hot spots" along with fairly well defined soil gas plumes of these compounds. TCE results showed two hot spots, one in the stream valley west of the north meadow and the second in the south meadow immediately north of the paved storage area. BTEX results showed relative higher concentrations detected at the southern end of the study area and a relatively low concentration hit southwest of the pond. The undecane, tridecane, and pentadecane results showed relative high concentration areas, one in the central portion of the storage area and the second in the southeast corner of the study area.

Analysis of soil gas provides an indication of which groups of contaminants may be present in either soil, or groundwater, or both matrices. The soil gas positive hits detected in each module can indicate contamination from any of these sources. These contaminant detections were used to direct the following phases (test pitting, geologic/hydrogeologic) of the investigation.

4.2 SURFACE WATER AND SEDIMENT CONTAMINANT DISTRIBUTION

As part of the investigation, nine surface water and sediment samples were collected from the NUWC Pond, Deerfield Creek, and the unnamed stream that enters the site from the golf course and analyzed to assess the potential impact of site releases to the adjoining water bodies. Two of these locations, SW/SD-01 and SW/SD-04, are considered upgradient of the study area.

A complete set of chemical data from analysis of surface water samples collected is presented in Appendix F-1. A similar data set for sediment samples collected is presented in Appendix F-2.

4.2.1 Surface Water Contaminant Distribution

Surface water samples were collected at nine locations, in conjunction with nine sediment locations discussed below. Two of the nine sample locations were collected upgradient of the study area (SW01 and SW04) boundary. Table 4-1 presents all detected surface water analytes as compared to the Ambient Water Quality Criteria – Critical Continuous Concentrations (AWQC-CCC) freshwater criteria and Federal Maximum Contaminant Levels (MCLs) criteria. Both total and dissolved metals were compared to the AWQC for this SASE report. Analytical results that exceed for the AWQC-CCC or MCL criteria are shown as highlighted on this table.

The AWQCs provide a set of non-promulgated guidelines for water quality that are protective of aquatic organisms and of human health (for consumption of aquatic organisms and drinking the water). The AWQC-CCCs were used as screening benchmarks to which the surface water results were compared. MCLs are drinking water standards that are protective of human health. Using these two sets of screening values, chemicals and metals detected in surface water can be qualitatively evaluated with respect to the potential threats to ecological receptors and to humans that use the water bodies near the site.

Compounds detected in the surface waters consisted of two VOCs, one SVOC, three pesticides, and metals (both total and dissolved). No VOC or SVOC compounds exceeded AWQC-CCC or MCLs. Analytical results that exceeded the criteria included:

- Pesticide compound – 4,4-DDT exceeded AWCC-CCC criteria at SW02. (Note – Duplicate sample was non-detected for DDT)

- Metals – Aluminum, lead, and thallium – results detected above the AWQC-CCC or MCL criteria include aluminum at two locations (SW03 and SW09), lead at one location (SW03), and thallium at the SW04 location.

4.2.2 Sediment Contaminant Distribution

Sediment samples were collected at nine locations co-located with nine surface water locations discussed above. Two of the nine sample locations were collected upgradient of the study area (SD01 and SD04). Table 4-2 presents all detected sediment contaminants as compared to the USEPA Region IX Industrial Soil Human Health Preliminary Remediation Goals (IS-PRGs) and Rhode Island Department of Environmental Management (RIDEM) – Industrial/Commercial Soil Direct Exposure Criteria (Direct Exposure Criteria). Analytical results that exceed the criteria are presented as highlighted text in the table.

Contaminants detected in the sediments consisted of VOCs, SVOCs, pesticides, PCBS, and metals. No VOCs exceeded the IS-PRGs or Direct Exposure Criteria. Analytical results that exceeded the criteria included:

- Semivolatile organic compounds (PAHs) - Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene – All four PAHs were detected at the SD03 location and one PAH (benzo(a)pyrene) was also detected at the SD07, SD08, and SD09 locations. The highest concentration of benzo(a)pyrene was detected at 2600 ug/kg, at station SD-03.

- PCBs - Aroclor 1268 – One PCB, Aroclor-1268, exceeded the IS-PRG at the SD07 location (2.5 mg/kg).

- Metals – Aluminum, arsenic, iron, lead, and manganese - Metals detected above the PRG or SDE criteria included aluminum, arsenic, iron, lead, and manganese. These metals exceeded the IS-PRG and Direct Exposure Criteria for arsenic and iron at most sediment locations and lead exceeded the IS-PRG and/or Direct Exposure Criteria at three of the nine sampling locations.

The highest concentrations of PAHs were found in sediments collected at SD03, which is located near a large concrete outfall pipe resembling a storm drain. While no water was being discharged by this pipe at the time of sampling, storm water discharge in this area could be a contributor to PAHs in the local sediment.

Elevated concentrations of lead were detected at stations SD02, SD03, and SD06, (and to a lesser extent SD07). These concentrations were similar to those found in soil collected at TP14 (Section 4.3 of this report). The lead in the soil at TP14 can possibly be attributed to what appeared to be a large number of pressurized containers, possibly the paint containers that are noted in the historic records (Section 2 of this report). These containers are also visible in the northern embankment of Deerfield Creek, upstream of SD02 near the southern limit of the site. Distribution of lead in these samples indicate that the lead could be originating from the possible paint containers, or within the soil at that location, and is being deposited in the slower sections of the stream. Lower concentrations of lead in sediment samples taken from Deerfield Pond (SD08 and SD09) indicate that lead contaminants have not been transported that far.

Metals are a naturally occurring component of soil and/or localized mineral deposits, or are the result of decomposition of weathered bedrock. Metals may also be introduced into the environment through various industrial activities in disposal of waste materials or process sludge and fugitive emissions, from thermal or combustion processes. The two upgradient sediment locations (SD01 and SD04) have arsenic and iron exceedances.

4.3 SOIL SAMPLE CONTAMINANT DISTRIBUTION

Table 4-3 presents all detected soil contaminants as compared to IS-PRGs and RIDEM Direct Exposure Criteria. Using these two sets of screening values, chemicals and metals detected in soils can be qualitatively evaluated with respect to the potential threats to ecological receptors and to humans. The values which exceed the criteria are presented as bolded text in the table. A complete set of analytical data from soil samples collected is presented in Appendix F-3.

A summary of the 16 test pits and excavations is provided in Table 4-4 for the areas investigated. Table 4-4 includes excavation dimensions, depth of fill (if applicable), sample identification, field headspace screening analysis results and other pertinent information for each test pit. Test Pit Logs are provided in Appendix B. Photographs taken during the test pit excavation activities are presented in the attached photographic record (Appendix A). A video file of test pit excavations is also provided in Appendix A.

Table 4-5 provides a summary of soil boring information including depth of fill and samples collected. Soil boring logs are provided in Appendix B

4.3.1 Paved and Gated Storage Area

Soil samples were collected from soil borings SB01, SB02, SB03, SB04, and SB06 in the Paved Gated Storage Area of the site. Contaminants detected in soils in this area included VOCs, SVOCs, PCBs, TPH

(DRO and GRO), and metals. No SVOCs, pesticides, or PCBs results exceeded the IS-PRGs or Direct Exposure Criteria. Analytical results that exceeded the criteria included:

- VOCs – 1,2,4 trimethylbenzene meets the IS PRG of 17,000 ppb, at SB04. SB04 showed other benzene compounds at elevated concentrations (butylbenzene, propylbenzene, etc.) although below published criteria. These aromatic compounds were also detected at SB01, SB02, and SB03 although only at trace concentrations.

- Metals – Arsenic, iron, and manganese - Frequently detected above IS-PRGs and/or Direct Exposure Criteria in this area. Both arsenic and iron consistently exceeded the criteria at most sample locations while manganese exceeded the criteria only at locations SB03 and SB04.

The elevated concentrations of benzene compounds in SB04 correlate to high headspace readings obtained in screening samples collected during boring advancement (refer to Table 4-5). This finding also correlates somewhat to relative elevated detections of benzene compounds in the soil gas survey. Soil gas data was used to map benzene, toluene, ethylbenzene, and xylene (BTEX), however some of the benzene compounds may be reflected in the interpretation (Appendix D).

Arsenic concentrations were elevated above soil criteria in this area, as similar to the rest of the site. Site concentrations ranged from less than 1 mg/kg to 90 mg/kg. Most reported concentrations of arsenic were in the 10-25 mg/kg range.

4.3.2 Paved Open Storage Area

Soil samples were collected from soil borings SB-05, SB-08, and from Test Pit TP-14 in the Paved, Open Storage Area. Contaminants detected in this area included VOCs, SVOCs, PCB, TPH, and metals. Pesticides were not detected.

No VOCs, SVOCs, PCBs, or TPH exceeded the IS-PRGs or the direct exposure criteria. Analytical results that exceeded the criteria included:

- Metals – Aluminum, arsenic, iron, and lead. Arsenic and iron were detected above the criteria in all samples collected in this area. Aluminum exceeded the criteria in four of the nine samples collected, and at all three of the locations. Lead exceeded the criteria at one location – TP14, at a depth of 5-6 feet (co-located with what appeared to be empty paint cans).

Volatile organic compounds detected in this area include the same benzene compounds reported in SB04 (Section 4.3.1), although only at trace concentrations (SB05). Trace concentrations of tetrachloroethene and trichloroethene were detected in the deeper soils at MW04B, collected from 14-16 feet bgs (top of bedrock was interpreted as 15 feet bgs).

Elevated lead was detected in the soils at TP14, co-located with numerous carcasses of what appeared to be spray cans. Also detected in soils in TP14 were phenolic compounds, as well as phthalates, and PAHs. Concentrations of phenolics were generally higher at the bottom of the excavation, though the lead was highest at the 5-6 foot interval.

Arsenic concentrations were elevated above soil criteria in this area, as similar to the rest of the site. Site concentrations ranged from less than 1 mg/kg to 90 mg/kg. However, most reported concentrations of arsenic were in the 10-25 mg/kg range.

4.3.3 South Meadow

Soil samples were collected from test pits TP01, TP02, TP05, TP06, TP07, TP08, TP15, TP15A and the soil boring for MW04B well in the South Meadow area of the site. Contaminants detected in the South Meadow area soils included VOCs, SVOCs, PCBs, TPH (DRO and GRO), and metals. No pesticides results exceeded the IS-PRGs or Direct Exposure Criteria. Analytical results that exceeded the criteria included:

- Volatile Organic Compounds – Naphthalene - detection exceeded the IS-PRG criteria at the TP02, TP15A and the soil boring MW04B locations.

- Semivolatile organic compounds – Carbazole – is representative of a non-PAH SVOC detected at concentrations above IS-PRGs and/or Direct Exposure Criteria and benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, indeno(1,2,3-cd)pyrene, naphthalene, and pyrene are representative of PAH compounds detected above IS-PRGs and/or Direct Exposure Criteria in this area. The PAHs were the most frequently detected at the TP02, TP08, and TP15A locations.

- PCBs – Aroclors 1248 and 1254 – The PCBs Aroclor-1248 and Aroclor-1254 exceeded the PRG criteria at the TP07 location.

- TPH exceeded the direct exposure criteria of 500 mg/kg at TP15A and TP02.

- Metals – Aluminum, arsenic, barium, iron, lead, and manganese - Both arsenic and iron frequently exceeded the criteria at most sample locations while aluminum, barium, lead and manganese results exceeded the criteria infrequently.

The high concentrations of SVOCs and TPH were detected in the soils and sludge found associated with the drum removed from TP02. As Table 4-4 describes, one drum containing a tar-like substance was removed from this test pit, and additional drum carcasses were visible in the side walls of the test pit. The sample TP02-0203 represented the residue visible in the soil at the depth from which the drum was removed. Although this location correlates to a soil gas sample which showed relative high concentrations of TCE, TCE was not found in soil samples collected from this test pit.

High concentrations of petroleum related SVOCs and TPH were also found at TP15A, associated with a layer of black asphalt like substance present at the 3-6 foot depth interval.

PCBs (Aroclor 1248 and 1254) were detected above soil criteria in test pit TP07. No visual evidence of contamination was noted at this location, other than solid debris as noted in Table 4-4.

Arsenic concentrations were elevated above soil criteria in this area, as similar to the rest of the site. Site concentrations ranged from less than 1 mg/kg to 90 mg/kg. Most reported concentrations of arsenic were in the 10-25 mg/kg range. Additionally, the lowest concentrations of arsenic found at the site were generally associated with the more contaminated fill (i.e. TP15A – oily residue, and TP02-drum residue).

4.3.4 North Meadow

Soil samples were collected from test pits TP09, TP10, TP11, TP12, TP12A, and TP13 and soil boring SB07 in the North Meadow area of the site. Contaminants detected in the North Meadow area soils included VOCs, SVOCs, PCBs, TPHs which include DRO and GRO, and metals. No VOCs, pesticides, or PCBs results exceeded the IS-PRGs or Direct Exposure Criteria. Analytical results that exceeded the criteria included:

- PAH compounds - Benzo(a)pyrene. Only one SVOC, PAH benzo(a)pyrene was detected above the IS-PRG in TP10 and TP12A surface soils.

- Metals – Aluminum, arsenic, and iron - Both arsenic and iron were frequently detected above criteria at most of the sampled locations while aluminum only exceeded the criteria at the TP09, TP10, and TP11 locations. The highest concentration of arsenic at the site (90 mg/kg) was detected at TP13, in the 0-1 foot interval, which appeared to be native soils (Table 4-4).

Only minor exceedances of PAHs and metals are noted in this area. Findings from test pit excavations and soil borings indicate shallow bedrock in this area, and what appeared to be native soils predominating. No substantial fill was noted in this area (Tables 4-4 and 4-5). Test pit TP11 was excavated in a location where relative high concentrations of TCE were noted in a soil gas sample. No fill was identified in this area, and no TCE was detected in the soil samples collected.

Arsenic concentrations were elevated above soil criteria in this area, as similar to the rest of the site. Site concentrations ranged from less than 1 mg/kg to 90 mg/kg. Most reported concentrations of arsenic were in the 10-25 mg/kg range.

4.4 GROUNDWATER CONTAMINANT DISTRIBUTION

A total of four monitoring wells were installed and sampled as part of this investigation. Wells located upgradient of the site were not sampled as a part of this SASE. Data from these upgradient wells is published by TRC (1999).

TRC reported 1,1,1-Trichloroethane (1,1,1-TCA) in groundwater to the south and east (upgradient) of the NUSC Disposal Area. While 1,1,1-TCA was not detected in the bedrock aquifer in wells installed as a part of this SASE, it was detected at trace concentrations in sediment and surface water collected from Deerfield Creek. This pattern suggests that the stream is capturing water from the formation to the south before it migrates onto the occupied portions of the site.

Table 4-6 presents a summary of analytical results for contaminants detected in on-site groundwater wells. Analytical results that exceed MCLs and/or RIDEM GA Groundwater Objectives criteria in Table 4-6 are presented as bolded text. A complete set of data collected is presented in Appendix F-4.

Analytical results that exceeded the criteria in groundwater included:

- Volatile Organic Compounds – Tetrachloroethene and trichloroethene – Groundwater results confirmed trichloroethene previously identified in soil gas sampling at the site, but was not found in co-located soil samples.

- Metals – Arsenic and cadmium – Cadmium exceeds criteria in both the total and dissolved fractions of the groundwater sample for the MW01B location while arsenic only exceeded the MCL criteria in the total metals fraction sample for the MW02B location.

Tetrachloroethene (PCE) was detected in groundwater collected from MW04B. Deep soil samples from this boring also noted low concentrations of tetrachloroethene.

Trichloroethene (TCE) was detected at 1500 ug/l at MW03B. This location is correlated to the soil gas sample that indicated presence of TCE at a relative high concentration. Soil samples from the co-located TP11 did not indicate TCE present. Trace concentrations of TCE and PCE were also detected in MW01B co-located with TP02, and the location of buried drums (Section 4.3.3).

Groundwater samples from MW01B and MW02B indicated elevated concentrations of cadmium and arsenic, respectively.

5.0 CONTAMINANT FATE AND TRANSPORT

The fate and transport of contaminants in environmental media are determined by a variety of factors. The physical and chemical properties of contaminants and the environmental media (i.e., soil, groundwater, surface water, air) in which the contaminants are released are all factors that determine the eventual fate of these chemicals. For the NUSC Disposal Area, the combination of site-related contaminants, geologic and hydrogeologic conditions, and surface features influence how contaminants released to site soils have migrated into other environmental media (i.e., the underlying groundwater, surface water bodies, and sediments) or have been transformed as the result of degradation processes.

As presented in Section 2, the past operating practices at the NUSC Disposal Area have resulted in contaminant presence in site fill. Throughout NUSC Disposal Area operating history, unknown quantities of organic and inorganic chemicals were disposed of as part of the fill at the site. Some of these chemicals have potentially remained adsorbed to soils while others have been mobilized to deeper soils, into groundwater, and into the adjacent surface water bodies.

This section briefly describes the general fate and transport processes, identifies chemicals found in on-site media, and presents an assessment of the potential fate and transport of those chemicals on and off the site. The assessment of contaminant fate and transport in this report is qualitative; much more information and field measurements would be required to provide definitive quantitative analyses.

The evaluations of contaminant fate and transport presented in this section are based on existing site conditions, interpretations of chemicals presence in the environmental media, physical state of soil and groundwater contaminants, general fate and transport mechanisms, and the interpretation of the site's geologic and hydrogeologic conditions. Evaluation of fate, how contaminants migrate, and whether the potential exists for contaminants to migrate off site, were limited in this assessment because of the limited understanding of the site geology and hydrogeology.

Section 5.1 summarizes the general fate and transport processes and contaminant properties that influence fate and transport. More detailed descriptions of fate and transport processes are available in a number of technical publications and documents. The probable contaminant fate and transport in site soils, groundwater, and in surface water and sediments are discussed in Sections 5.2, 5.3, and 5.4, respectively.

5.1 FATE AND TRANSPORT PROCESSES

For the NUSC Disposal Area, the fate and transport processes of concern are those that govern the migration of soil contaminants (once released or deposited) to other media (groundwater, surface water, and sediments). Once these contaminants have entered into other media, other fate and transport mechanisms occur that may cause further chemical migration or transformations. This generalized discussion of fate and transport processes is provided so that the observed site-specific contamination conditions can be better characterized and understood.

5.1.1 General Fate and Transport Processes of Soil Contaminants

A variety of processes occur that may cause organic and inorganic chemicals in fill to become immobilized, degraded, or to mobilize to another environmental medium. Some of these processes include:

- Volatilization – Chemicals having high Henry's Law coefficients or vapor pressures will readily enter (volatilize) to the ambient air rather than remaining adsorbed to the soil particles. Once in the atmosphere, the chemicals may undergo further transport through additional processes such as advection, diffusion, or dispersion. The chemicals may also be transformed through chemical processes such as hydrolysis or photolysis.

- Leaching – Chemicals may be transported downward through the soil strata by water from precipitation or by liquids that infiltrate through the soils. The leaching of chemicals from soils and the subsequent mobilization are controlled by soil properties (i.e., adsorptive capacity, organic carbon content, clay content, or specific surface area) and by chemical properties (i.e., solubility, ability to partition to other phases).

- Runoff/Erosion – In situations where the chemicals remain adsorbed (bound) to soil particles because of the soil or chemical characteristics, chemicals may still be mobilized from contaminated areas to other uncontaminated environmental media. Contaminants can be conveyed over land by runoff that occurs during precipitation events (solubilized in rainwater or adsorbed to suspended particles), or through the erosion of contaminated soils that are present on unstable slopes or topographic features.

5.1.2 General Fate and Transport Processes of Groundwater Contaminants

For chemicals that have migrated downward into groundwater from the unsaturated soils through precipitation infiltration and leaching, additional natural processes come into play that affect the contaminants' fate and transport in the subsurface environment. Geologic conditions greatly influence contaminant migration, providing physical avenues or barriers that could increase or retard migration.

The major contaminant transport processes in groundwater typically consist of advection, dispersion, and molecular diffusion. Advection, the bulk movement of groundwater, is the principal mechanism for contaminant transported in an aquifer. Dispersion and diffusion are secondary processes for dissolved contaminant transport. Two transformation processes are important in determining the ultimate fate of contaminants in groundwater: degradation and retardation. Each of the transport and transformation processes is briefly described below:

- Advection - The dominant transport process consists of the movement of dissolved phase contaminants or of particles within a natural fluid flow. Advection is the flow of a fluid in response to a gradient, such as pressure or hydrostatic, and contaminant transport results from the entrainment of chemicals in a flow field. Advection of dissolved contaminants in an isotropic, homogenous, porous medium results in the contaminants being transported with and migrating at the same velocity as groundwater.

- Dispersion – Dispersion is the component of transport that is related to the spatial variations in the flow path and variations in velocity that characterize groundwater movement at all scales. Dispersion results in spreading of a contaminant plume over a larger area (both parallel and perpendicular to the hydraulic gradient) than would be expected by advective transport alone.

  Dispersion results from groundwater flow around individual soil particles or lenses of material, following convoluted pathways. These torturous flow paths cause mixing resulting in chemical transport from high concentration regions to lower ones. The groundwater pathway becomes more convoluted as aquifer heterogeneity increases. At the NUSC study area, most groundwater exists within the bedrock, which will allow dispersion through fractures and voids in the bedrock.

- Molecular Diffusion – Diffusion is propensity for chemical molecules to move from regions of higher concentrations to regions of lower concentrations as the result of random thermal motion of molecules. Dissolved contaminants will migrate in response to a concentration gradient within an aquifer. Because this transport process occurs on the molecular scale, its effect is small in

comparison to the forces driving the more rapid advection processes; diffusion is significant only in aquifers that have clayey sands and silts with low groundwater velocities.

- Preferential Flow – In aquifer systems, preferential pathways for groundwater flow occur due to heterogeneities in the subsurface soils and the bedrock matrix. Geologic materials that are more permeable (soils or bedrock fractures) allow the preferential flow of groundwater and chemicals through those geologic units.

- NAPL Migration - NAPL transport (if present at the site) differs from the transport of dissolved phase contaminants because it is strongly influenced by geologic features in the aquifer. NAPLs can migrate along or into geologic features in directions that differ from advective groundwater flow. NAPLs may encounter and remain restricted by low permeability geologic units, or remain in pockets in the upper portion of the water column. DNAPLs may sink and migrate along the top of less permeable stratified units or along the top of the bedrock surface layer, until another preferential pathway is encountered. The DNAPLs can enter bedrock fractures and continue along horizontal and vertical pathways, influenced primarily by gravity and the presence of adequately sized and conductive fractures. No NAPL s have been located at the site to date.

- Biological Degradation – The degradation of organic groundwater contaminants can occur by biotic and abiotic means. In biological degradation (biodegradation), microorganisms utilize available chemicals to obtain needed energy and nutrients through reduction-oxidation (redox) reactions (or simply, through the transfer of electrons). Depending on the microorganisms and contaminants present, biodegradation can occur in groundwater under either aerobic or anaerobic conditions.

Under aerobic conditions, carbon (as organic compounds, whether naturally occurring or anthropogenic) is oxidized by microorganisms to provide a net energy gain that is necessary for growth and reproduction. Typically, low-molecular weight and soluble organic compounds are readily degraded by bacteria and fungi. Aromatic hydrocarbons (i.e., BTEX compounds) are used by microorganisms as a primary substrate (electron donor). Dissolved oxygen is used as the primary electron acceptor (chemical reduction) by the aerobic microorganisms. Once the oxygen is depleted, anaerobic microorganisms (bacteria) use other available electron acceptors and causing those chemicals to be transformed to a reduced state. Nitrate is converted to nitrogen gas or ammonia, ferric iron (Fe [III]) to ferrous iron ([II]), manganese ([IV]) to manganese ([II]), sulfate to sulfide ion, chlorinated solvents to compounds with one less chlorine atom, and carbon dioxide to methane. Through sequential reductive dechlorination of chlorinated ethenes, tetrachloroethene may be degraded to ethane through the following sequence:

a) tetrachloroethene - trichloroethene - 1,1-dichloroethene; cis-1,2-dichloroethene; or trans-1,2-dichloroethene - vinyl chloride - ethene - ethane

b) or vinyl chloride may degrade to complete mineralization (CO_2, H_20, and CL^-)

Through the degradation processes, chemicals that were not originally present at the site may be produced. In some cases, these daughter products may be more toxic than the original compounds released at the site.

- Abiotic Degradation - Mechanisms of abiotic degradation include hydrolysis, oxidation, and reduction. Hydrolysis is the process where a chemical molecule and a water molecule are both split and recombine to form new chemicals. Oxidation consists of the loss of electrons by an organic compound or by a metal ion. Reduction is the chemical reaction whereby an organic compound or a metal gains electrons. Thus subsurface contaminants may be degraded or transformed by these abiotic processes that occur naturally. The dominance or effectiveness of these transformation processes are governed by factors such as temperature, pH, solubility, etc.

- Retardation - In groundwater, adsorption-desorption reactions lead to retardation of the rates at which contaminants migrate with advective groundwater flow. During contaminant migration through an aquifer, an organic molecule may adsorb to stationary soil particles, to iron oxyhydroxide or to organic coating on the particles, thus slowing the chemical's transport with the groundwater flow. Only after desorption will a contaminant rejoin the groundwater flow. The retardation factor (R) is governed by the partition coefficient (Kp) of organic compounds or by the distribution coefficient (Kd) of metals between the sorbed state and the dissolved state. These coefficients are available in reference books or may be measured in the laboratory using site-specific samples.

5.2 CONTAMINANT FATE AND TRANSPORT IN SITE SOILS

Past releases of solvents, organic compounds, and inorganic compounds to the site's ground surface and/or subsurface have resulted in the presence of VOCs, SVOCs, PCBs, TPH, and metals in site soils/fill. Depending on a variety of factors, some of these chemicals have been mobilized and have migrated into other environmental media.

5.2.1 VOCs Fate and Transport in Soils

VOCs were first identified during the soil gas survey investigation. The results of the soil gas survey showed two TCE hot spots, one in the stream valley west of the plateau area and the second in the open field immediately north of the paved storage area. BTEX results showed higher concentrations detected at the southern end of the study area and a relatively low concentration southwest of the pond. The undecane, tridecane, and pentadecane results showed two relative hot spots, one in the central portion of the storage area and the second in the southeast corner of the study area. The two TCE "hot spot" areas identified during the soil gas survey were not detected in the soils but were detected in the groundwater at these locations. VOCs detected in soils are presented in Table 4-3. and include aromatic and chlorinated hydrocarbons, most notably trimethylbenzene and napthalene.

Speculation is that the aromatic VOCs were probably released in liquid form to site fill soils prior to filling. The napthalene and heavier petroleum-related organics appear to be associated with oily soil, possibly used as fill directly instead of a direct oil discharge. The fate of the VOCs was dependent on the properties of the chemicals and the receiving environmental medium. Liquid VOCs would seep into the unsaturated soils and adsorb to soil particles, enter into the soil pore spaces, or migrate vertically downwards under the influence of gravity.

Volatilization - VOCs adsorbed to soils at the ground surface would likely have volatilized to the ambient air because of their high vapor pressures and contact with the atmosphere. For VOCs remaining in shallow soils (but below ground surface), the opportunities to volatilize are much fewer. For some VOCs, relatively low level analytical results identify the presence in soils but the soil gas TCE "hot spot" areas did not correspond to soils data from these areas and therefore the soil gas results appear to be a result of groundwater concentrations rather than soil levels.

Leaching - VOCs in the unsaturated soils act as continuing sources of contamination to groundwater. Periodically, precipitation infiltration permeates the unsaturated soils and gradually leaches VOCs away from soil particles and the humic materials. In most of the fill areas, groundwater is well below fill, in the bedrock, so infiltration would be the primary route through the soil and fill. However, this process is likely to be reduced or slowed dramatically where asphalt is present.

While the quantities and when VOCs were released to the site soils are unknown, the solubilities of these chemicals offer some insight to the persistence of some of the VOCs relative to others. The following table presents the solubilities for several VOCs detected in the site's environmental media.

Water Solubility of Various VOCs					
Chlorinated VOCs	**Solubility (mg/L)**	**Ketones (1)**	**Solubility (mg/L)**	**Aromatic Hydrocarbons**	**Solubility (mg/L)**
Tetrachloroethene	200	Methyl ethyl ketone	239,000	Benzene	1,780
Trichloroethene	1,100	Methyl isobutyl ketone	20,400	Toluene	505
		Acetone	1,000,000	Ethylbenzene	152
				Xylenes	161-185

(1) Common ketones are listed on the table for illustration, they were not detected at high concentrations at the site.

Because the ketones are very water soluble, these VOCs will partition more readily to precipitation infiltration from soil particles and pore spaces, and will be transported with groundwater. Ketones are therefore the most mobile of the VOCs. The chlorinated solvents VOCs are less water soluble than ketones; tetrachloroethene is the least soluble of the chlorinated solvents detected at the site. The aromatic hydrocarbons, with the exception of benzene, are generally less soluble than the chlorinated solvents. Therefore, it may be expected that chlorinated solvents and aromatic hydrocarbons adsorbed to unsaturated soils will gradually be leached by periodic precipitation events. Tetrachloroethene and trichloroethene are expected to be persistent in site soils. However, it is notable that only minor concentrations of these contaminants were found in soil and fill at the site.

Biodegradation - Some limited biodegradation of organic compounds may be occurring at the site. Microorganisms metabolize carbon sources (such as organic carbon or petroleum hydrocarbons) and require electron acceptors to complete the oxidation-reduction reactions mediated by the microorganisms. However, additional information would be required to determine this process is active at the site.

5.2.2 SVOCs Fate and Transport in Soils

SVOCs were only detected sporadically in site soils at generally shallow and near surface depth intervals. SVOCs (phthalates and PAHs) are typically non-volatile or have low volatility, and are much less soluble than VOCs. Therefore, these SVOCs are likely to remain adsorbed to soil particles and are only gradually leached by precipitation infiltration. Phenolic compounds have higher water solubilities comparable to those of aromatic hydrocarbons and could be mobilized by leaching. However, phenolic compounds were infrequently detected in both soils and in groundwater. For SVOCs, biodegradation is possible, but is likely to be slow.

SVOCs adsorbed to the soil particles present at the ground surface could be released to the ambient air through fugitive dust emissions. Wind erosion could cause contaminants adsorbed to soil particles to be

transported offsite through advective air flow. However this process is likely to be minimized at this time due to the presence of vegetation and asphalt paving at the site.

In summary, while SVOCs are present in shallow soils, they are not likely to be mobilizing to groundwater based on the absence of these compounds in groundwater. Erosion of soils may be causing the transport of SVOCs to sediments into Deerfield Creek and Deerfield Pond. However, the SVOCs' presence in sediments may also be a result of storm water runoff.

5.2.3 Pesticides/PCBs Fate and Transport in Soils

Similar to the SVOCs, pesticides and PCBs are relatively non-volatile and generally insoluble in water. Pesticides were only infrequently detected at shallow soil depths. Soils bearing adsorbed pesticides could be mobilized through fugitive dust emissions, but vegetation and asphalt cover at the site is likely to minimize this occurrence. Because pesticide presence on site is sparse, minimal pesticides migration is likely to have occurred.

PCBs were detected at shallow depth intervals and at low concentrations (maximum of 5 mg/kg), in several of the test pits. Because PCBs are nonvolatile, have low solubility (only 0.049 to 0.24 mg/L), and adsorb readily to organic matter and fine-grained soils, they are expected to be relatively immobile in the subsurface environment. Biodegradation of PCBs does occur, but usually the degradation rate is very low. PCBs are expected to be persistent in the site soils. Review of groundwater analytical results indicates that PCBs have not been detected in onsite groundwater.

5.2.4 Metals Fate and Transport in Soils

As presented in Section 4, a variety of metals were detected in site soils. The metals adsorbed to soil particles can be mobilized through fugitive dust emissions, through erosion, or through leaching to groundwater.

5.2.4.1 Soil to Air Migration

Soils present at the ground surface are subject to wind erosion and precipitation runoff that can convey the metals off site. Currently, much of the site is vegetated and covered with asphalt, and the potential for fugitive dust emissions is low.

5.2.4.2 Soils to Sediments Migration

An evaluation of the site topography identified several areas where contaminated soils could potentially be eroding into Deerfield Stream and Deerfield Pond. In the southern portion of the site, soils containing elevated concentrations of lead have been identified and sediment in the wetlands associated with Deerfield Creek and Deerfield Pond show similar lead concentrations. During precipitation events, contaminated soils can be conveyed by runoff from the fill areas that are exposed to the stream and ponds.

5.2.4.3 Soil to Groundwater Migration

The metals detected in on-site soils were also detected in the underlying groundwater. The fill contains metals that may be result of releases or representing those that occur naturally as components of soil minerals although some (including arsenic and iron) are present at what appear to be naturally elevated concentrations. When subjected to precipitation, and based on the solubilities of the compounds, metals can be leached from the fill or soils and conveyed into the underlying groundwater. Metals may also be leached from the soils into groundwater through the seasonal rise and fall of the water table. At this site, groundwater seems to be limited to the bedrock for the most part, so metals leached from fill to groundwater would have to be liberated by precipitation passing through that fill. This condition will slow the leaching of metals to groundwater, if it is occurring.

Once metals are leached from the surficial soils into the vadose zone and into the saturated soils (i.e., groundwater aquifer), the dissolved-phase metals will continue to migrate with groundwater flow. Other natural reactions may occur that retard (i.e., sorption, reduction-oxidation reactions, etc.) the rate at which the metals migrate in the subsurface.

For site groundwater, metals that exceed the MCLs in groundwater include arsenic and cadmium . While these metals were detected in the site soils, it is difficult to determine if they are likely attributable to past onsite releases. Arsenic is found everywhere in filled areas and areas where natural soils exist. Cadmium was not found exceeding screening criteria in soil or fill. The arsenic concentrations in site soils were comparable to concentrations found in other NAVSTA background soil studies, which suggests that they are naturally occurring as part of the soil mineralogy.

For the NUSC Disposal Area, if the lead detected in groundwater were mobile, then the lead would likely be detected in discharges to surface water. Since lead was not found at elevated concentrations in groundwater or surface water, it does not appear to be leaching from the soil.

5.3 CONTAMINANT FATE AND TRANSPORT IN SITE GROUNDWATER

Once organic contaminants or metals enter into the groundwater, the primary transport mechanism is through advective flow. Diffusion and dispersion also can promote the migration of contaminants within the aquifers. After the organic chemicals or metals enter into the overburden aquifer, they can continue migrating with the general direction of groundwater or be removed from the aqueous phase through retardation processes. Available data indicate that groundwater from the site appears to be discharging to Deerfield Creek and Deerfield Pond.

5.3.1 VOCs Fate and Transport in Groundwater

Once in the overburden aquifer, the dissolved phase VOCs will be transported via advective flow and be discharged to the streams or pond, or even be transported as far as Narragansett Bay. As the VOCs migrate through the aquifer, their progression could be retarded by various processes such as sorption to mineral deposits in the bedrock fractures or degradation by chemical or biological means. Attenuation through dilution can also occur through mixing with less contaminated or uncontaminated groundwater, or through the influx of precipitation infiltration.

There does not appear to be evidence suggesting that tetrachloroethene and trichloroethene are undergoing sequential reduction. No detections of 1,2-dichloroethene nor vinyl chloride, the common degradation products, were identified. This very limited data set indicates that the chlorinated solvents are passing somewhat quickly without degradation to the pond or downstream through bedrock fractures.

5.3.2 SVOCs Fate and Transport in Groundwater

SVOCs are generally insoluble or only slightly soluble in groundwater. SVOCs will likely adsorb to organic carbon present in the soils. The groundwater analytical data indicates minimal presence of SVOCs in groundwater, suggesting that the SVOCs are therefore not mobile and are not being conveyed by groundwater flow.

5.3.3 Metals Fate and Transport in Groundwater

Once in the aqueous phase, the metals will be conveyed with the ambient groundwater flow. As groundwater migrates through the site, some of the metals will undergo transformation processes that result in their return to an insoluble state. Reduction-oxidation, precipitation, and adsorption reactions can cause the dissolved phase ions to leave the aqueous phase.

However, some of these metals will continue to migrate with groundwater and will discharge to the streams and pond. As dissolved metals are discharged to the sediments, some of the metals will likely be adsorbed and removed from the aqueous phase because of interactions with organic materials, sulfides, or oxyhydroxides.

5.4 CONTAMINANT FATE AND TRANSPORT IN SURFACE WATER AND SEDIMENTS

Once site-related contaminants enter into the sediments and surface water (through erosion or groundwater discharge), other processes occur that affect the fate and transport of the organic chemicals and metals that have migrated from the site.

Erosion of the streambank slope may result in the transport of site-related contaminants to the sediments immediately adjacent to the site. Some sediments may settle out further downstream, becoming available to the benthic organisms. As the organisms migrate off-site, some contaminants could biomagnify and bioaccumulate through the food chain.

5.4.1 VOCs Fate and Transport in Surface Water and Sediments

VOCs conveyed by groundwater that discharge to the streams and pond could accumulate in the sediments or be discharged directly to surface water. The VOCs in sediments are likely to be biodegraded, partition to surface water, or remain bound to the organic matter present in stream sediments. VOCs that enter into surface water can volatilize into the ambient air where they are degraded by photolysis or hydrolysis; remain in surface water and undergo degradation processes such as biodegradation, hydrolysis, or reduction-oxidation reactions; or become attenuated through dilution, diffusion, and advection. Low concentrations of 1,1,1,-TCA were detected in surface water and sediment, likely as a result of an historic release at Building 1129.

5.4.2 SVOCs Fate and Transport in Surface Water and Sediments

As described in Section 5.2.3, SVOCs are generally insoluble, are not very mobile, and are unlikely to migrate with groundwater to discharge into surface water and sediment. Based on the interpretation of analytical results, the site does not appear to be contributing SVOCs through the groundwater transport to the surface water or sediments that adjoin the site. Some SVOCs exist in the sediment, likely a result of erosional transport from site soils or input from storm drainage.

5.4.3 Pesticides/PCBs Fate and Transport in Surface Water and Sediments

Neither pesticides nor PCBs were detected in any surface water sample; the site is not contributing either type of contaminant to the stream or pond. Evaluation of analytical results indicates that the site is not contributing any significant pesticides presence to sediments that adjoin the site.

5.4.4 Metals Fate and Transport in Surface Water and Sediments

Dissolved metals that migrate with site groundwater and discharge to sediments and surface water undergo various transformation processes. The metal ions may be adsorbed to the organics-rich sediments or to the fine-grained particles in sediments. Metals bound to sediments will be conveyed downstream through sediment transport processes such as mixing, advection, and sedimentation. While small quantities of metals appear to have been contributed by the site to sediments in adjacent surface water bodies, the net effect is negligible because the resultant metals concentrations are comparable to levels detected in the background locations.

Unadsorbed metal ions that continue migrating into surface water will be subjected to oxidation-reduction reactions, attenuation through advection, dilution, diffusion, or dispersion, or may settle out as a precipitate after they have formed insoluble species. Based on the evaluation of analytical results, the site appears to be contributing metals, particularly lead, to sediment in the wetland areas.

5.5 SUMMARY OF FATE AND TRANSPORT

At the NUSC Disposal Area, past storage of numerous military and commercial grade items have resulted in the presence of the release to the site soils of VOCs (chlorinated solvents and aromatic hydrocarbons), SVOCs (including PAHs), PCBs, and metals. Other metals are likely a result of natural mineralization of the parent bedrock. Due to the combination of site-related contaminants, geologic and hydrogeologic conditions, and surface features, contaminants released at the site appear to have migrated into other environmental media (i.e., the underlying groundwater, surface water bodies, and sediments).

TCE appears to have moved from some unknown release point down through the fill directly to the bedrock groundwater. This direct route is likely due to a lack of an overburden aquifer, and due to the highly fractured nature of the bedrock. The release point may be on site or at some other upgradient location. Further evaluation will be needed to determine if there is an onsite source of TCE contributing to its presence in the site groundwater. It appears that the bedrock groundwater discharges to the pond, utilizing a fracture zone found near MW03B.

SVOCs, pesticides, PCBs, and dioxins in soils are relatively non-volatile organic compounds and are generally insoluble in water. Therefore, there is very limited leaching of these chemicals out of the fill into groundwater. Leaching is minimized due to the fill being mostly above the groundwater table, and the isolation of the fill in some areas by asphalt paving.

Lead present in the soil and fill may become mobilized through erosion and runoff. Based on the evaluation of analytical results, this metal appears to be undergoing a mechanical transport from the embankment near TP14, downstream through erosion and sediment movement.

6.0 BACKGROUND

This section is reserved for an assessment of a background soil investigation to be conducted at the NUSC Disposal area. In accordance with the RIDEM remediation regulations (1996), background soil concentrations could be determined for sites to address naturally occurring concentrations of contaminants.

Revisions of the RIDEM remediation regulations proposed in 2003 and finalized in 2004 do not contain such a provision for comparison of site data to background. However, the Navy's policy on the use of background chemical levels is to evaluate site contaminants against background conditions (CNO, 2004). Therefore, as of the publication date of this draft report, the background investigation has been planned, but not yet completed.

7.0 SCREENING-LEVEL HUMAN HEALTH RISK EVALUATION

This section presents the methodology for and the results of the human health risk screening evaluation conducted for the NUSC disposal area described in Sections 1.0 through 6.0. The objective of the screening evaluation is to assess the need for performing a full, quantitative human health risk assessment for the site. This human health risk screening evaluation has been conducted in accordance with the work plan contained in the Work Plan for Study Area Screening Evaluation, NUSC Disposal Area (B&R, 1998, revised TtNUS, 2003).

Section 7.1 and Table 7-1 present an overview of the various media, exposure points, potential receptors, and exposure pathways evaluated in this screening evaluation. Section 7.2 outlines the method used to determine which of the detected chemicals at the study area are most likely to present a risk to potential receptors. The end result of this qualitative selection process is a list of chemicals of potential concern (COPCs) for each medium. Tables 7-2.1 through 7-2.5 present the list of detected chemicals at the study area and the rationale for the selection or exclusion of each detected chemical.

The methodologies used to determine exposure point concentrations for the selected COPCs are presented in Section 7.3. Tables 7-3.1 through 7-3.5 present the selected COPCs for the study area and their associated representative concentrations. The results of the human health screening evaluation are discussed in Section 7.4. A discussion of the uncertainties associated with the screening evaluation is presented in Section 7.5. A summary of the findings of the screening evaluation is presented in Section 7.6.

7.1 POTENTIAL RECEPTORS

The potential receptors identified for the study area include current commercial workers exposed to surface soils and sediment, future commercial workers who may be exposed to sediment and soil (0 – 15 feet) which may be brought to surface through excavation and land development, as well as potential future off-site residents who may be exposed to the surface water and groundwater migrating from the site as a primary drinking water source. The site is not currently used for residential purposes and future use is anticipated to be industrial. Access to the site is restricted as a secured naval facility, and therefore, the receptor scenarios evaluated do not include trespassers. Exposures of commercial workers to site-related contaminants would be through inadvertent contact.

7.2 SELECTION OF CHEMICALS OF POTENTIAL CONCERN

COPCs for this human health risk evaluation are limited to those chemicals that exceed a selection criterion. A list of COPCs was compiled for each sampled medium at the site: sediment, surface soil (0 – 1 feet below ground surface (bgs)), soil (0 – 15 feet bgs), groundwater, and surface water. Only validated data were used in this evaluation. Surface water and sediment samples collected from locations SW/SD-01 and SW/SD-04 are located just outside the site, in the streams feeding into the site. These sample results were included in the data set. Background conditions for soil and sediment have not yet been evaluated.

The following screening criteria were used to identify COPCs for direct contact exposure to sediment and soils:

- **EPA Region IX Preliminary Remediation Goals (PRGs) for Industrial Soil.** Because land use surrounding the site is commercial, it is assumed that future use of the site will be commercial. The EPA Region IX industrial soil exposure values consider the ingestion, dermal, and inhalation exposure pathways. For carcinogenic chemicals, the values used for COPC screening are based on a 1E-06 target incremental lifetime cancer risk. The criteria for non-carcinogenic chemicals are based on a target hazard quotient (HQ) of 1.0. For a conservative screening, these EPA Region IX industrial soil exposure values for non-carcinogenic chemicals were adjusted to COPC screening levels based on a target non-carcinogenic hazard quotient of 0.10, which is one tenth of the suggested cumulative target non-carcinogenic risk for a potential receptor.

- **EPA Soil Lead Guidance.** EPA Region IX and California EPA have developed PRG concentrations for lead based on pharmacokinetic models. The models are designed to predict the probable blood lead concentrations for residential as well as non-residential exposures (e.g. worker). The screening level used for this evaluation was selected for non-residential exposures (750 mg/kg).

- **Rhode Island Department of Environmental Management (RIDEM) Soil Direct Exposure for Industrial Use.** The RIDEM direct exposure soil screening values for industrial land use were used as potential applicable or relevant and appropriate requirements to be considered.

The following screening criteria were used to identify COPCs for direct contact exposure to groundwater and surface water:

- **Federal Maximum Contaminant Levels (MCLs).** MCLs are the highest level of a contaminant that is allowed in drinking water. The site is not currently a residential site; however, the groundwater and surface water sample results were evaluated with these drinking water screening levels to assess potential risk to residents should the land use change to residential in the future, and groundwater and/or surface water were to be used as the primary drinking water source for these potential future residents.

- **RIDEM Direct Exposure Criteria for Groundwater (GA).** The RIDEM direct exposure criteria for groundwater screening values for GA-classified water (drinking water source) were used as potential applicable or relevant and appropriate requirements to be considered in assessing potential risk to residents should the land use change to residential in the future.

- **National Secondary Drinking Water Standards.** Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. The site is not currently a residential site; however, these secondary standards were used as potential applicable or relevant and appropriate requirements to be considered in assessing potential risk to residents should the land use change to residential in the future.

Where there are no screening criteria for the groundwater and/or surface water contaminants, the chemical-specific EPA Region IX screening value for tap water was used.

Contaminants were selected as COPCs if their calculated representative concentration exceeded any of the media-specific screening criteria described above. Background concentrations were not used to eliminate COPCs since background information is not available at this time.

Calcium, magnesium, and potassium are considered essential nutrients and were therefore not selected as COPCs. Aluminum, cobalt, copper, and iron were not selected as COPCs since EPA Region I does not advocate quantitative risk assessment for these contaminants. Total and dissolved metals results were reported for the groundwater and surface water data. Both results were compared to the risk-based screening criteria; however, the 95% UCLs for the total metals results were used as the representative concentrations for contaminants that were selected as COPCs. Chromium was screened using the chromium VI PRG since it is considered to be more toxic than total chromium and therefore more conservative.

The contaminants 4,4'-DDD and 4,4'-DDE are breakdown products of 4,4'-DDT. While these contaminants were screened individually, the 4,4'-DDD and 4,4'-DDE results were also totaled and are

included in Tables 7-2.1 through 7-2.5 as "Total 4,4'-DDT". For screening purposes, the EPA Region IX PRG for 4,4'-DDT was used for the total 4,4'-DDT. All positive individual Aroclor PCB results were added to obtain a total Aroclor value that was used for screening. There is no EPA Region IX PRG or RIDEM screening criterion for total Aroclors; however, the EPA Region IX PRGs for several individual Aroclors are listed as 740 ug/kg. A screening value of 1,000 ug/kg was used as a conservative value to screen total Aroclor concentrations.

In some cases, naphthalene was reported in both the volatile and semivolatile analyses. For screening purposes, the result yielding the highest representative concentration was used. The m-, o-, and p-xylene isomers were totaled to produce a total xylene value. There are no screening criteria for the xylene isomers; however, a total xylene PRG screening value does exist. Therefore, the total xylene concentrations were used for screening.

Tables 7-2.1 through 7-2.5 summarize the results of the COPC screening process as well as present the frequency of detection, minimum and maximum concentrations detected, and the sample location of the maximum detected concentration. Contaminants were selected as COPCs if their calculated representative concentration exceeded the selected screening criteria.

The following contaminants have maximum concentrations that exceed the risk-based screening values but not the representative concentration used for screening (95% UCL):

<u>Sediment</u>

Total Aroclors

<u>Surface Soil (0 – 1 foot)</u>

Indeno(1,2,3-cd)pyrene
Total Aroclors

<u>Soil (0 – 15 foot interval)</u>

2-methylnaphthalene
Carbazole
Chrysene
Dibenzofuran
Diethylphthalate

Fluoranthene
Phenanthrene
Pyrene
Total Aroclor
Lead
Managanese

The maximum concentrations for these contaminants appear in bold on Tables 7-2.1 through 7-2.3.

The methods used for calculating the representative concentrations as well as the reasonable maximum exposure (RME) and central tendency exposure (CTE) concentrations are described in the following section.

7.3 CALCULATION OF EXPOSURE POINT CONCENTRATIONS

The exposure point concentration (EPC) is generally defined as the 95 percent upper confidence limit (UCL) on the mean and is calculated using the latest risk assessment guidance from EPA (Calculating the Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites, December 2002). A value of one-half the detection limit is substituted for non-detected values in the calculation. The average of the field duplicate pair results was used in the calculation as well.

For this screening evaluation, the distribution of the data from each sampled medium was determined using the Shapiro-Wilk W-Test. When the results of the test showed a normal distribution, the Students-t Test was used to calculate the UCL. If the data were lognormal, the Land's Method for Lognormal Distributions was used to calculate the UCL. For data with undefined distributions, the non-parametric Standard Bootstrap Procedure was used to calculate the UCL, using the ProUCL software. The distribution-appropriate 95% UCL was compared to the maximum detected concentration. If the 95% UCL was greater than the maximum detected concentration, the maximum detected concentration was reported as the representative concentration and EPC for the RME, and the lesser of maximum and arithmetic average concentration was used as the EPC for the CTE. If the 95% UCL was less than the maximum detected concentration, the calculated 95% UCL was used as the screening concentration and reported as the EPC for both the RME and the CTE. In a full, quantitative risk assessment, the CTE scenario uses average values for exposure parameters and represents an "average case" exposure scenario. The RME scenario uses maximum values for exposure parameters and represents a "reasonable worst case" exposure scenario. The RME scenario is intended to provide an upper bound estimate of the possible risk.

Tables 7-3.1 through 7-3.5 present the medium-specific EPCs for both RME and CTE scenarios for each COPC.

7.4 SCREENING EVALUATION RESULTS

The risk-based screening values used in this evaluation represent concentrations of contaminants above which unacceptable risks may be possible under the conditions evaluated in a full risk assessment. Therefore, it is anticipated that the medium-specific contaminants listed below may require further evaluation to determine whether or not they represent unacceptable risks to their potential receptors.

Sediments

The following chemicals were identified as direct exposure sediment COPCs and may contribute to unacceptable risks to current and future commercial workers:

- PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene)
- Metals (arsenic, lead, manganese)

There were no volatile or pesticide/PCB contaminants exceeding the risk-based screening criteria in the sediments (Table 7-2.1). The volatile compound 4-isopropyltoluene was detected in one of the nine sediment samples collected, in one of the streams feeding into the site, at location DA-SW/SD-01, at a concentration of 0.70 ug/kg. There were no other contaminants exceeding screening criteria in the sediments at this location. There is no screening criterion for 4-isopropyltoluene; however, since it was detected infrequently, it is not anticipated that the omission of this chemical from a quantitative risk assessment, if one were performed, would have a significant effect.

Based on the chemical-specific representative concentration to screening concentration ratios, it is expected that benzo(a)pyrene and arsenic would be the main contributors to the carcinogenic risk and lead and manganese would be the main contributors to non-carcinogenic risks due to sediment exposure at this site.

Surface Soil (0 – 1 foot)

The following chemicals were identified as direct exposure surface soil COPCs and may contribute to unacceptable risks to current commercial workers:

- PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene)

- Metals (arsenic)

There were no volatile or pesticide/PCB contaminants exceeding risk-based screening criteria in the surface soil samples (Table 7-2.2). The volatile compound 4-isopropyltoluene was detected in one of the 15 surface soil samples collected, at sample location DA-TP-01, at a concentration of 260 ug/kg. There were no other contaminants exceeding screening criteria in the surface soil at this location. There is no screening criterion for 4-isopropyltoluene; however, since it was detected infrequently, it is not anticipated that the omission of this chemical from a quantitative risk assessment, if one were performed, would have a significant effect.

The chemical-specific representative concentration to screening concentration ratios indicate that benzo(a)pyrene would be the main contributor to carcinogenic risk due to exposure to surface soil at this site. Total Aroclors would also be a large contributor to the carcinogenic risk if maximum detected concentrations were used in the COPC screening process rather than the calculated representative concentrations. Non-carcinogenic COPCs were not selected for the surface soil.

Soil (0 – 15 foot interval)

The following chemicals were identified as direct exposure soil COPCs and may contribute to unacceptable risks to current and future commercial workers:

- PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene)

- Metals (arsenic)

The volatile compound 4-isopropyltoluene was detected in seven of the 65 soil samples collected, at sample location DA-SB-04, at a maximum concentration of 6400 ug/kg, and a 95% UCL of 417 ug/kg. There were no other contaminants exceeding screening criteria in the soil at this location (Table 7-2.3). There is no screening criterion for 4-isopropyltoluene; however, it is not anticipated that the omission of this chemical from a quantitative risk assessment, if one were performed, would have a significant effect.

The semivolatile compound 4,6-dinitro-2-methylphenol was detected in one of the 65 soil samples collected at the site, at location DA-TP-14, at a concentration of 260 ug/kg. There is no screening criterion for this compound. The remaining semivolatiles detected that exceeded screening criteria were

not located at this location. Due to its infrequent detection, it is not anticipated that the omission of this chemical from a quantitative risk assessment, if one were performed, would have a significant effect.

The chemical-specific representative concentration to screening concentration ratios indicate that benzo(a)pyrene and dibenzo(a,h)anthracene would contribute most to the carcinogenic risk and naphthalene would be the main contributor to the non-carcinogenic risk from soil exposure at this site.

Groundwater

The following chemicals were identified as direct exposure groundwater COPCs and may contribute to unacceptable risks to future residents:

- Volatiles (tetrachloroethene, trichloroethene)
- Metals (arsenic, cadmium, manganese)

Risk-based screening criteria were available and used to screen all contaminants detected in the groundwater at the site (Table 7-2.4).

The chemical-specific representative concentration to screening concentration ratios suggest that trichloroethene would be the main contributor to carcinogenic risk and manganese would contribute most to non-carcinogenic risk due to exposure to the groundwater at this site.

Surface water

The following chemicals were identified as direct exposure surface water COPCs and may contribute to unacceptable risks to future residents:

- Metals (manganese, molybdenum, thallium)
- Pesticides (dieldrin)

Risk-based screening criteria were available and used to screen all contaminants detected in the surface waters at the site (Table 7-2.5).

The chemical-specific representative concentration to screening concentration ratios suggest that dieldrin would be the main contributor to carcinogenic risk and manganese would contribute most to non-carcinogenic risk due to exposure to the surface water at this site.

7.5 UNCERTAINTY ANALYSIS

Uncertainty in the selection of COPCs is associated with the current status of the predictive databases and the procedures used to include or exclude chemicals of concern. For instance, using the 95% UCL or the maximum detected concentration if the 95% UCL exceeded the maximum detected concentration as the representative concentration, as opposed to using the maximum detected concentration, may have impacted the selection or exclusion of COPCs since the representative concentrations are always less than or equal to the maximum detected concentrations. Using the maximum detected concentrations in this screening process may have identified more contaminants as COPCs. Tables 7-2.1 through 7-2.5 indicate where the maximum detected concentration exceeds the screening level but the representative concentrations do not by bolding the maximum detected concentration.

Measurement uncertainty may exist due to variance attributed to sampling techniques and laboratory analysis of contaminants. The screening evaluation reflects the accumulated variances of the individual values used.

The 95% UCL values calculated for the sediment, groundwater, and surface water data are based on data sets of less than 10 samples. Therefore, the confidence in the UCL values is lower than those reported from larger data sets.

7.6 SCREENING EVALUATION SUMMARY

The following contaminants may contribute to elevated health risks to current and/or future industrial/commercial workers exposed to sediment at the site:

- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Dibenzo(a,h)anthracene
- Arsenic
- Lead
- Manganese

The following contaminants may contribute to unacceptable health risks to current and/or future commercial workers at the site exposed to soil:

- Benzo(a)anthracene
- Benzo(a)pyrene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Dibenzo(a,h)anthracene
- Indeno(1,2,3-cd)pyrene
- Naphthalene
- Arsenic

The following contaminants may contribute to unacceptable health risks to future residents downgradient of the site who may be exposed to groundwater or surface water from the site:

- Tetrachloroethene
- Trichloroethene
- Dieldrin
- Arsenic
- Cadmium
- Manganese
- Molybdenum
- Thallium

Benzo(a)pyrene, dibenzo(a,h)anthracene, and arsenic would most likely be the main contributors to carcinogenic risks while manganese, and naphthalene are expected to contribute most to the non-carcinogenic risks due to current and/or future soil/sediment exposure at this site. Trichloroethene and dieldrin would most likely be the main contributors to carcinogenic risk due to groundwater and surface water exposure, respectively, and manganese the main contributor to non-carcinogenic risk due to groundwater and/or surface water exposure at this site.

Due to the findings of this risk screening evaluation, the contaminants identified, and the screening level exposure point concentration values, a full, quantitative human health risk assessment is appropriate for this site, in conjunction with a remedial investigation.

8.0 ECOLOGICAL RISK ASSESSMENT

8.1 INTRODUCTION

The goal of this Ecological Risk Assessment (ERA) is to determine whether adverse ecological impacts are present as a result of exposure to chemicals released to the environment through historical activities at Naval Underwater Systems Center (NUSC) Disposal Area in Middletown, Rhode Island. This ERA contains information that will enable risk managers to conclude either that ecological risks at the site are most likely negligible, or that further information is necessary to evaluate potential ecological risks at the site.

The ERA methodology follows guidance presented in the following guidance documents:

- Final Guidelines for Ecological Risk Assessment [United States Environmental Protection Agency (USEPA), 1998].
- Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (USEPA, 1997).
- Navy Policy for Conducting Ecological Risk Assessments [Department of Navy (DON), 1999].

Figure 8-1 is the Ecological Risk Assessment Tiered Approach.

This ERA consists of Steps 1, 2, and 3a of the eight steps required by the above guidance documents. The first two steps are the screening-level ecological risk assessment (SERA), where conservative exposure estimates are compared to screening-level and threshold toxicity values. Step 3a is the first step in the baseline ecological risk assessment (BERA) and consists of refining the conservative assumptions following Steps 1 and 2. Step 3a consists of a refinement of the conservative exposure assumptions to further focus the ERA process on the chemicals of greatest concern at a site.

8.2 PROBLEM FORMULATION

Problem formulation is the first phase of an ERA and discusses the goals, breadth, and focus of the assessment. It includes general descriptions of the NUSC Disposal Area with emphasis on the habitats and ecological receptors present. This phase also involves characterization of site-related chemicals, chemical sources, migration routes, and an evaluation of routes of chemical exposure.

8.2.1 Environmental Setting

Section 3 of this report presents a detailed description of the terrestrial and aqueous habitats present at the NUSC Disposal Area. The following presents a summary of that information.

The NUSC Disposal Area (the site) is located on the northwestern edge of the NUSC. The site occupies approximately 5 acres north of Building 1170 and Cunningham Street (Figure 1-1, 1-2).

The site can be physically described as fill area, an elevated stream embankment area which borders a pond and a stream, (Deerfield Creek) and the associated wetlands. A golf course abuts the site to the northeast. A second small stream also flows through the northern portion of the site in an east-west direction. The stream originates from the golf course northeast of the site. This small stream joins Deerfield Creek and flows into the pond. The pond discharges through a dam/culvert system which, in turn, discharges to Narragansett Bay, at a point south of McAllister Point Landfill (Figure 1-1). Habitats throughout and adjacent to the site are characteristic of fragmented, developed landscapes of lightly industrialized or commercial areas. Approximately 30% of the site is covered by pavement, but the remaining area provides some habitat value.

The pond is considered an open water habitat with some emergent vegetation along the edge. Along the stream is a low-lying wet area with vegetation typical of a stream environment. Most of the mature trees are present along the embankment of the stream valley, with sporadic trees within the stream valley basin.

The upland areas (North Meadow and South Meadow) are mainly open grassland with some dense groundcover of herbaceous plants. The surrounding area consists of more woody shrubs, saplings, and trees. The storage area is paved with asphalt and does not provide habitat or beneficial ecological functions.

The site consists of highly fragmented habitat, large open paved areas with chain-link fence around most of the area, and minimal quality habitat. Therefore, the range of terrestrial, wetland, and avian species expected to utilize the site is somewhat limited. However, the dense vegetation in the area does provide cover, foraging, and breeding/nesting areas for birds, mammals, reptiles, and amphibians that do not require large home ranges. The pond and streams provide important freshwater sources for wildlife, and migratory birds are expected to use the area during migration.

8.2.2 Potential Sources of Contamination

The Initial Assessment Study (IAS) report (Envirodyne, 1983) identified areas where potential contamination from past waste disposal or handling practices may pose environmental risks. The NUSC Disposal Area was reviewed under the IAS.

Relatively little historical information is available on the NUSC Disposal Area other than its reported use for disposal of scrap lumber, tires, wire, cable, and empty paint cans for an unspecified period of time (Envirodyne, 1983). In several of the test pits, conducted as part of this SASE, metal drum debris with tar-like residue, corroded paint cans, asphalt, roofing tar paper, etc. were found (Section 4 of this Report). Items such as these that were disposed of in the soil across the site could be both an historic and continuing source of contaminant releases.

8.2.3 Potential Exposure Pathways

In general, chemicals released from materials used as fill in terrestrial areas can initially contaminate surface soils. Natural precipitation can then cause the chemical contaminants to leach downward into subsurface soils and groundwater. Discharge of the groundwater can result in the contamination of surface water and sediment inhabited by aquatic receptors. Erosion of the surface soil can also carry contaminants directly to wetland areas. Eroded surfaces are currently present at this site and may have been more prevalent in the past when vegetation did not cover the site as thoroughly. However, at this point in time the area is well vegetated and surface soil runoff is not very prevalent.

8.2.3.1 Surface Soil

Terrestrial ecological receptors such as plants, soil invertebrates, mammals, birds, and reptiles can be exposed to contaminated surface soil through direct contact as they search for food and burrow into the soil. Mammals, birds, and reptiles can also ingest contaminated surface soil and food items in which contaminants have accumulated. Some terrestrial receptors such as burrowing mammals or deep-rooted trees could be exposed to shallow layers of contaminated subsurface soils or to shallow groundwater. However, most terrestrial receptors are not substantially exposed to subsurface soils greater than 2 feet in depth, or to groundwater that has not discharged to surface water, so these pathways are not evaluated in this ERA.

8.2.3.2 Sediment

Aquatic ecological receptors, such as fish, benthic invertebrates, reptiles, and amphibians, can be exposed to sediment contamination through direct contact and incidental sediment ingestion. Terrestrial wildlife may also be exposed to the sediment, although to a lesser degree through direct contact and incidental sediment ingestion. Terrestrial vertebrates, such as piscivorous wildlife, may be exposed to contaminated sediment through ingestion of aquatic prey (i.e., fish).

8.2.3.3 Surface Water

Aquatic ecological receptors, such as fish, benthic invertebrates, reptiles, and amphibians, can be exposed to surface water contamination through direct contact and surface water ingestion. Terrestrial wildlife may also be exposed to the surface water through direct contact and surface water ingestion.

8.2.4 Endpoints

8.2.4.1 Assessment Endpoints

Assessment endpoints are explicit expressions of the environmental value that is to be protected (USEPA, 1997a). The selection of these endpoints is based on the habitats present, the migration pathways of probable contaminants, and the routes that contaminants may take to enter receptors.

The habitats present at the NUWC Disposal Area consist of terrestrial habitats such as forested and open areas with grasses and shrubs and aquatic habitats consisting of streams, wetlands, and a pond. Therefore, the assessment endpoints include the protection of the following groups of receptors from adverse effects of contaminants on their growth, survival, and reproduction:

- Carnivorous birds and mammals
  - Insectivorous birds and mammals
  - Piscivorous birds and mammals
- Herbivorous birds and mammals
- Soil invertebrates
- Benthic invertebrates
- Fish and other aquatic organisms
- Terrestrial vegetation

The following paragraphs present the selection of the assessment endpoints listed above for this ERA.

Carnivorous Birds and Mammals - Carnivorous birds and mammals consume invertebrates, fish, and other mammals and birds. These animals are considered first-level carnivores and they serve as a food source for higher trophic level carnivores. Piscivorous birds and mammals also are present along the streams and pond near the site. Carnivorous birds and mammals that feed on other birds and mammals are at the top of the food chain, but they are less densely distributed than first-level carnivores because they require a larger area to hunt for their food. All of the carnivores may be exposed to and accumulate contaminants that are present in the food items they consume.

Herbivorous Birds and Mammals – Herbivorous birds and mammals (animals that consume only plant tissue) may forage at the site. Their role in the community is essential because, without them, higher trophic-level animals could not exist. These animals can be exposed to and accumulate contaminants that are present in the plants they consume.

Soil invertebrates – Soil invertebrates include earthworms, the juvenile stages of many insects, and other small organisms that directly inhabit the surface soil. These organisms are expected to be present in the soil in terrestrial habitats at the site. Soil invertebrates promote plant growth by aiding in the formation of soil and through redistribution and decomposition of organic matter. Soil invertebrates also serve as a food source for many mammals and birds. Contaminants can bioaccumulate from the soil into the tissues of soil invertebrates used as a food source by mammals and birds.

Benthic Invertebrates - Benthic invertebrates serve as a food source for higher trophic level organisms (i.e., fish, amphibians, birds, mammals). They also can accumulate some contaminants, which can then be transferred to higher trophic level organisms that consume invertebrates. Benthic macroinvertebrates are present in the sediments within streams, wetlands, and pond near the site.

Fish - Fish are present in the streams and pond near the NUSC Disposal Area. Fish feed primarily on invertebrates, plants, and/or other fish. Fish are exposed to and can accumulate contaminants from the food items they consume or from the surface water/sediment in which they live.

Terrestrial Vegetation – Terrestrial vegetation at the site consists of herbs (grasses, rushes, ferns, and other non-woody plants), shrubs, woody vines, and trees. These plants serve as a source of food and shelter for many organisms and help prevent soil erosion and excessive surface runoff. Plants can also bioaccumulate some chemical contaminants from the soil that can then be transferred to organisms that feed on the plant tissue.

USEPA guidance (USEPA, 1997a) states that "it is not practical or possible to directly evaluate risks to all of the individual components of the ecosystem at a site. Instead, assessment endpoints focus the risk assessment on particular components of the ecosystem that could be adversely affected by contaminants from the site." Therefore, the ERA will focus on the endpoints tending to yield the highest risks, which should account for endpoints that have lower risks.

Large carnivorous birds and mammals were not selected as assessment endpoints because their home range is much larger than the site and most of their food would come from other locations. Risks are likely to be greater to small mammals and birds that obtain all of the food from the site. Although amphibians and reptiles are likely to be present in and along the streams and pond near the site, they were not selected as assessment endpoints because of the general lack of toxicity information and the lack of methods to evaluate their exposure to contaminants. Finally, aquatic and semi-aquatic plants were not selected as assessment endpoints because there is limited toxicity data to evaluate potential risks to these receptors.

8.2.4.2 Measurement Endpoints

Measurement endpoints are estimates of biological impacts (e.g., mortality, growth, reproduction) that are used to evaluate the assessment endpoints. The following measures of effects were used to evaluate the assessment endpoints, where appropriate:

- Decreases in survival, reproduction and growth of plants, soil/benthic invertebrates, and fish were evaluated by comparing chemical concentrations in surface soil, sediment, and surface water to screening values designed to be protective of ecological receptors.

- Decreases in survival and reproduction of birds and mammals were evaluated by comparing estimated ingested doses of contaminants in surface soil, sediment, surface water, plants, fish, and/or invertebrates to no observed adverse effects levels (NOAELs) and lowest observed adverse effects levels (LOAELs).

8.2.4.3 Selection of Receptor Species

Many receptors in the soil and surface water environments at the site are adequately described in general categories such as soil invertebrates, benthic invertebrates, vegetation, and fish. This is due to the nature of the threshold values, effects values, or criteria that are typically used to characterize risk for such organisms. For vertebrate receptors, selection of a particular species is required so that intake through eating and drinking can be estimated. To be conservative, chosen representative species have

small home ranges. The availability of exposure parameters such as body mass, feeding rate, and drinking rate also are factors in selecting surrogate species. The following surrogate species were used for the food chain modeling, which is further discussed in Section 8-4:

- Herbivorous mammal: Meadow vole
- Herbivorous bird: Bobwhite quail
- Insectivorous mammal: Short-tailed shrew
- Insectivorous bird: American robin
- Piscivorous mammal: Raccoon
- Piscivorous bird: Great blue heron

Receptor profiles for the above species are presented in Appendix G.1.

8.2.4.4 Conceptual Site Model

A conceptual site model (CSM) in ERA problem formulation is a written description of predicted relationships between ecological entities and the stressors to which they may be exposed (USEPA, 1998). The CSM consists of two primary components: predicted relationships among stressor, exposure, and assessment endpoint response, and a diagram that illustrates the relationships (USEPA, 1998). Figure 8-2 is a pictorial presentation of these relationships. At the NUSC Disposal Area, the source of the chemicals is presumably from elements of the fill that was disposed at the site. Therefore, the immediate exposure medium is the surface of that fill, represented, in part by surface soil. Terrestrial plants, invertebrates, and vertebrates are exposed to the surface soil by direct contact and ingestion of soil and other food items. Contaminants can also infiltrate into the groundwater, which is then released to the surface water where it also contaminates the sediment. Overland runoff or erosion leads to contamination of the surface water as well. Aquatic and semi-aquatic vegetation, benthic invertebrates, and vertebrates are exposed to the surface water and sediment by direct contact and/or ingestion of sediment and surface water and other food items. Terrestrial vertebrates may be exposed to chemicals found in the air via inhalation. Although this pathway is possible, it is not a significant pathway and is not evaluated in this ERA.

8.3 ECOLOGICAL EFFECTS EVALUATION

The preliminary ecological effects assessment is an investigation of the relationship between the exposure to a chemical and the potential for adverse effects resulting from exposure. In this step, screening levels for toxicity of the chemicals to ecological receptors are compiled.

8.3.1 Terrestrial Plants/Invertebrates and Benthic Invertebrates

Potential risks to terrestrial plants/invertebrates and benthic invertebrates resulting from exposure to chemicals were evaluated by comparing chemical concentrations to ecological screening levels. Appendix G.2 provides the sources for the screening levels that were used for this ERA to evaluate potential risks to ecological receptors. These toxicity values are expressed in units of concentration because the media of concern are in direct contact with the terrestrial plants/invertebrates and benthic invertebrates.

8.3.2 Terrestrial Wildlife

Risk to terrestrial receptors for exposure to chemicals of potential concern (COPCs) in surface soil, sediment, and surface water were determined using food chain models to estimate the Chronic Daily Intake (CDI) and compare the CDI to toxicity reference values (TRVs) representing acceptable daily doses in mg/kg-day. The TRVs were developed from NOAELs and LOAELs obtained from wildlife studies, if available. The majority of the TRVs were obtained from the ORNL Toxicological Benchmarks for Wildlife: 1996 Revision (Sample et al., 1996) and supplemented with other toxicity information when necessary. Only chemicals considered to be important bioaccumulative chemicals by USEPA (USEPA, 2000) were included in the food chain model. Appendix G.3 presents the TRVs for the mammals and birds that were used in the ERA and the sources of the TRVs.

8.4 CHARACTERIZATION OF EXPOSURE

This portion of the ERA includes identification of contaminant concentration data used as the exposure point concentrations (EPCs) to represent ecological exposure in various media. Terrestrial plants and invertebrates are exposed to chemicals in the surface soil, and aquatic receptors are exposed to chemicals in the surface water and sediment through ingestion and/or direct contact. Maximum concentrations were used as the EPCs for comparison to the screening values in order to select COPCs.

Total exposure of terrestrial wildlife to COPCs in soil, surface water, and sediment (and associated food items such as plants, invertebrates, and fish) were determined for the surrogate wildlife species listed in Section 8.2.4.3 using the following equation:

$$CDI = \frac{[(Cf * If) + (Cs * Is) + (Cw * Iw)] * H}{BW}$$

Where:

CDI	=	Chronic daily intake (mg/kg-day)
Cf	=	Contaminant concentration in food – (see discussion below)
Cs	=	Contaminant concentration in surface soil or sediment (mg/kg)
Cw	=	Contaminant concentration in surface water (ug/L)
If	=	Food ingestion rate (kg/day)
Is	=	Incidental surface soil or sediment ingestion rate (kg/day)
Iw	=	Incidental surface water ingestion rate (L/day)
H	=	Portion of food intake from the contaminated area (unitless)
BW	=	Body weight (kg)

Contaminant concentrations in food items for insectivorous and herbivorous receptors were calculated as follows using soil to invertebrate or plant bioaccumulation factors (BAFs) from published sources:

$$Cf = Cs * BAF$$

Where:

Cf	=	Contaminant concentration in food (mg/kg)
Cs	=	Contaminant concentration in surface soil (mg/kg)
BAF	=	Biota-soil bioaccumulation factor (unitless)

Contaminant concentrations in food items for piscivorous receptors were calculated as follows using sediment to fish bioaccumulation factors from published sources:

$$Cf = Cs * BAF\left(\text{or } BSAF * \frac{\%L}{\%TOC}\right)$$

Where:

Cf	=	Contaminant concentration in food (mg/kg)
Cs	=	Contaminant concentration in sediment (mg/kg)
BAF	=	Biota-sediment bioaccumulation factor (for inorganics)(unitless)
BSAF	=	Biota-sediment bioaccumulation factor (for organics)(unitless)
%L	=	Percent lipids [14.24% (dry weight) for fish]
%TOC	=	Percent total organic carbon (TOC) (average TOC for the site)

The exposure assumptions (i.e., ingestion rate, body weight) were obtained primarily from the Wildlife Exposure Factors Handbook (USEPA, 1993) with other sources used as necessary. Table 8-1

summarizes the exposure factors that were used for the food chain model and Appendix G.1 presents the derivation of those parameters. Note that food ingestion rates are on a dry weight basis. The sources of the BAFs and biota-sediment bioaccumulation factors (BSAFs) are presented in Appendix G.4. Contaminants that do not have BAFs or BSAFs were assigned a default value of 1.0.

The following input parameters were used in the CDI equation for the surrogate species:

- Maximum surface soil, sediment, and surface water concentrations
- Maximum BAFs and BSAFs
- Conservative receptor body weights and ingestion rate

For refining the conservative exposure assumptions in Step 3a (see Section 8.6), the following input parameters were used:

- Average surface soil, sediment, and surface water concentrations
- Average BAFs or BSAFs
- Average receptor body weights and ingestion rates

8.5 RISK CHARACTERIZATION

The risk characterization is the final phase of an ERA that compares exposure to ecological effects. It is at this phase that the likelihood of adverse effects occurring as a result of exposure to a stressor was evaluated. An ecological effects quotient (EEQ) approach was used to characterize the potential risk to ecological receptors. This approach characterizes the potential effects by comparing exposure concentrations/doses to effects data. When EEQ values exceed 1.0, it is an indication that ecological receptors are potentially at risk; additional evaluation or data may be necessary to confirm with greater certainty whether ecological receptors are actually at risk, especially since most benchmarks are developed using conservative exposure assumptions and/or studies. The EEQ value should not be construed as being probabilistic; rather, it is a numerical indicator of the extent to which an exposure point concentration exceeds or is less than a benchmark.

The EEQs for surface soil receptors were calculated as follows:

$$EEQ = \frac{Css}{SSSL}$$

where:

EEQ	=	Ecological Effects Quotient (unitless)
Css	=	Contaminant concentration in surface soil (ug/kg or mg/kg)
SSSL	=	Surface soil screening level (ug/kg or mg/kg)

The EEQs for aquatic receptors were calculated as follows:

$$EEQ = \frac{Csw}{SwSL} \text{ or } \frac{Csd}{SdSL}$$

where:

EEQ	=	Ecological Effects Quotient (unitless)
Csw	=	Contaminant concentration in surface water (ug/L)
Csd	=	Contaminant concentration in sediment (ug/kg or mg/kg)
SwSL	=	Surface water screening level (ug/L)
SdSL	=	Sediment screening level (ug/kg or mg/kg)

The EEQ for the terrestrial wildlife model was calculated as follows:

$$EEQ = \frac{CDI}{TRV}$$

where:

EEQ	=	Ecological effects quotient (unitless)
CDI	=	Chronic daily intake dose (mg/kg-day)
TRV	=	Toxicity reference value (NOAEL or LOAEL) (mg/kg-day)

8.5.1 Selection of Contaminants of Potential Concern

The final part of the screening evaluation is selection of COPCs. Chemicals that are not selected as COPCs are assumed to present negligible risk to ecological receptors and are not considered for further evaluation in the ERA. Chemicals that are retained as COPCs are evaluated further in Step 3a to determine if they are carried through as chemicals of concern (COCs). Ecological COPCs were selected using the following procedures:

- Chemicals with EEQs greater than 1.0 (using screening values) were retained as COPCs for further evaluation because they have a potential to cause risk to ecological receptors.

- Chemicals with EEQs greater than 1.0 based on the food chain model using NOAELs were retained as COPCs because they have the potential to cause risk to higher trophic level mammals and birds.

- Chemicals without screening values were retained as COPCs but are only evaluated qualitatively.

- Calcium, magnesium, potassium, and sodium were not retained as COPCs because they are essential nutrients that can be tolerated by living systems even at high concentrations. No evidence indicates that these chemicals are related to site operations, and they are not considered hazardous chemicals.

8.5.1.1 Risks to Terrestrial Invertebrates and Plants

Table 8-2 presents the chemicals that were retained as COPCs in surface soil. Seven volatile organic chemicals (VOCs), four semivolatile organic chemicals (SVOCs), and one metal were retained as COPCs because no toxicity information was available. Twelve SVOCs [plus total polycyclic aromatic hydrocarbons (PAHs)], three pesticides (plus total DDTs), and nine metals were retained as COPCs because the maximum concentrations exceeded the surface soil screening levels (SSSLs).

8.5.1.2 Risks to Benthic Invertebrates

Sediment

Table 8-3 presents the chemicals that were retained as COPCs in sediment. Three VOCs, three SVOCs, and two metals were retained as COPCs because no toxicity information was available. Two VOCs, sixteen SVOCs [plus high molecular weight (HMW), low molecular weight (LMW), and total PAHs], two pesticides, two polychlorinated biphenyls (PCBs) (plus total PCBs), and twelve metals were retained as COPCs because the maximum concentrations exceeded the sediment screening levels (SdSLs).

Surface Water

Table 8-4 presents the chemicals that were retained as COPCs in surface water. Bis(2-ethylhexyl)phthalate, two pesticides, and four metals were retained as COPCs because the maximum concentrations exceeded the surface water screening levels (SWSLs).

8.5.1.3 Risks to Terrestrial Wildlife

Of the detected chemicals, fifteen SVOCs, four pesticides, three PCBs, and ten metals were considered important bioaccumulative chemicals. They are designated as "BIO" on tables 8-2 and 8-4. Tables 8-5 and 8-6 summarize the results of the conservative inputs food chain modeling. Appendix G.5 presents the calculation worksheets. After performing the food chain modeling using maximum concentrations and conservative input parameters, the following results were found:

- Soil herbivorous receptors – Six metals were retained as COPCs because the NOAEL EEQs were greater than 1.0 in the conservative scenario food chain model (see Table 8-5).

- Soil insectivorous receptors – Four PAHs, two pesticides, Aroclor-1254, Aroclor-1260, Aroclor-1268, and eight metals were retained as COPCs because the NOAEL EEQs were greater than 1.0 in the conservative scenario food chain model (see Table 8-5).

- Piscivorous receptors – Two PAHs, two pesticides, Aroclor-1260, Aroclor-1268, and four metals were retained as COPCs because the NOAEL EEQs were greater than 1.0 in the conservative scenario food chain model (see Table 8-6).

8.6 STEP 3A REFINEMENT

Step 3a consists of a refinement of the conservative exposure assumptions/concentrations to evaluate the potential risks to ecological receptors (i.e., plants, invertebrates, and wildlife receptors). The objective of the Step 3a evaluation is to further reduce the number of chemicals that are retained as COPCs in order to focus additional efforts on chemicals that are of major ecological concern.

8.6.1 Terrestrial Plants and Invertebrates

Table 8-2 lists chemicals that were retained as COPCs that will be further evaluated in the following sections.

Seven VOCs in the surface soil samples were retained as COPCs because screening levels were not available for those chemicals. Generally, VOCs are not considered toxic to plants and invertebrates at low concentrations as indicated by the relatively high screening levels for xylenes (1,000 ug/kg) as well as other VOCs that were not detected in the soil (i.e., benzene-5,000 ug/kg, ethylbenzene-1,200 ug/kg, and trichloroethene-3,000 ug/kg [CCME, 1997]). With the exception of one detection of 1,600 ug/kg for 1,2,4-trimethylbenzene (under pavement), the concentrations of the VOCs are all below 1,000 ug/kg.

Therefore, the concentrations of the VOCs are unlikely to cause risks to terrestrial plants or invertebrates. Also, the VOCs were detected relatively infrequently in the soil samples (between 1/15 and 3/15 samples). For these reasons, VOCs are not chemicals of ecological concern that warrant further evaluation at this site.

PAHs are the primary chemicals of ecological concern for this site (for the SVOCs). Twelve SVOCs (all PAHs) were retained as COPCs in the soil because they were detected at concentrations that exceeded screening levels for risks to plants or invertebrates while four SVOCs (non-PAHs) did not have screening levels. Of the four non-PAH SVOCs, 3,3-dichlorobenzene, and dibenzofuran were detected infrequently across the site (1/15 samples) while benzoic acid and carbazole were detected more frequently (5/15 and 7/15 samples, respectively). Since the elevated detections of carbazole correspond to the elevated detections of the PAHs, risks from carbazole will be accounted for by evaluating risks from PAHs. Benzoic acid does not appear to be site related because the elevated detections do not correspond to elevated detections of other chemicals. Therefore, although there may be potential risks from the non-PAH SVOCs, the lack of toxicity data for those chemicals will limit the evaluation of risk for those chemicals. PAHs, on the other hand, were detected in several samples across the site at concentrations that exceeded screening levels. For those reasons, PAHs are the only SVOCs that are considered chemicals of ecological concern for further evaluation at the site.

Although three pesticides were retained as COPCs because they were detected at concentrations that exceeded screening levels, they are not considered chemicals of ecological concern for further evaluation at the site. They were only detected in 1 of 15 samples each, at relatively low concentrations (<250 ug/kg), and were surrounded by nearby samples in which those pesticides were not detected. Therefore, they are not widespread across the site.

Ten metals were retained as COPCs because their maximum detections exceeded screening levels or screening levels were not available, however, potential risks are limited to a few samples. Aluminum and iron are typically not considered to be toxic to terrestrial plants or invertebrates because their bioavailability is low. Chromium, mercury, and vanadium were detected at concentrations exceeding the conservative screening levels, however, their maximum detections were not greater than Canadian Soil Quality Guidelines (SQG) (CCME, 1997) which were developed to protect plants and invertebrates. The Canadian SQGs were used in this Step 3a refinement to focus the list of chemicals to the chemicals that have the greatest potential to cause risks. Because most of the conservative screening values are very low, they do not provide much utility in refining the list of chemicals. Copper and zinc were only detected in one sample at concentrations that exceeded the Canadian Soil Quality Guidelines; both exceedances were at DA-S-TP10, which were bounded by lower concentrations in other samples. Finally, arsenic, cobalt and lead concentrations slightly exceeded the Ecological Soil Screening Levels (Eco SSL)

(USEPA, 2003a, b, and c) (cobalt and lead) or Canadian Soil Quality Guideline (arsenic) in three, four, and two samples, respectively. For these reasons, there may be some isolated risks to plants and invertebrates from metals in the soil, but any impacts to plants or invertebrates are not expected to be widespread across the site. In summary, the metals with the greatest potential for risks based on comparison to the SQGs or Eco SSLs are arsenic, cobalt, copper, lead, and zinc.

8.6.2 Aquatic Organisms

Tables 8-3 and 8-4 list chemicals that were retained as COPCs for media to which aquatic organisms will be exposed (sediment and surface water) and will be further evaluated in the following sections:

8.6.2.1 Sediment

Of the 13 VOCs that were detected in the sediment samples, two were retained as COPCs because their maximum detections exceeded the screening level (acetone and carbon disulfide) and three were retained as COPCs because they did not have screening levels (4-isopropyltoluene, chloroethane, and dichlorodifluoromethane). The maximum detection of dichlorofluoromethane, and the only detection of chloroethane were found in the upgradient sample (DA-S-SD01) so any potential risks from these chemicals are not site related. Acetone is a common laboratory contaminant and carbon disulfide is a possible laboratory contaminant and was only detected in 1/9 samples at a low concentration of 2.7 ug/kg. Therefore, these VOCs are not likely to be related to site activities. Finally, 4-isopropyltoluene was detected in 1/9 samples at a very low concentration of 0.79 ug/kg, well below the screening levels for all the other VOCs indicating the risks are unlikely from this chemical. For the reasons discussed above, VOCs are not chemicals of ecological concern that warrant further evaluation at this site.

Of the 19 SVOCs that were retained as COPCs in the sediment samples, 16 were retained as COPCs because they were detected at concentrations that exceeded screening levels (14 PAHs and two phthalates). The remaining three SVOCs (benzoic acid, benzyl alcohol, and carbazole were retained as COPCs because they did not have screening levels. Phthalates are common laboratory contaminants and are not expected to be related to site activities. Benzyl alcohol was only detected in the upstream sample and carbazole was only detected in one samples in the Deerfield Creek; therefore benzyl alcohol is not site-related and carbazole is not widespread across the site. Benzoic acid was detected in 8/9 samples but there is no toxicity data to evaluate this chemical.

High molecular-weight (HMW) PAHs, low molecular weight (LMW) PAHs, and total PAHs were evaluated in addition to individually detected PAHs in the sediment as part of the Step 3a refinement. This was done because the toxicity of PAHs has been reported to be additive and several studies have reported

toxicity data for total PAHs (Di Toro, et al., 2000). Several samples had PAHs concentrations (both totals and individual parameters) that exceeded the screening levels. The highest concentrations of PAHs were detected at sample location DA-S-SD03 in Deerfield Creek but PAH concentrations in Deerfield Pond also exceeded screening levels.

In summary, although SVOCs other than PAHs were detected at concentrations that exceeded screening levels or did not have screening levels, PAHs are the only SVOCs that are considered chemicals of ecological concern for further evaluation at the site. The other chemicals were either not site-related, not widespread across the site, and do not have toxicity data that can be used to evaluate those chemicals.

Two pesticides and two PCBs were retained as COPCs in the sediment samples because their concentrations exceeded their respective screening levels. Of these chemicals, 4,4'-DDE and alpha-chlordane were both only detected in 1/9 of the samples collected, at relatively low concentrations (<20 ug/kg). Therefore, they are not widespread across the site and do not appear to be significant chemicals of ecological concern. Although both PCBs were not widespread across the site (detected in 2/9 or 3/9 samples), the maximum detections of these chemicals (2,900 ug/kg for total PCBs) occurred at DA-SD07. This sample is located at the southern portion of Deerfield Pond with the other samples in the Pond over 300 feet away. Therefore, the spatial extent of the PCBs in the Pond is not known. For that reason, PCBs are considered chemicals of ecological concern.

Several metals were retained as COPCs because they were detected at concentrations that exceeded their respective screening levels. The results of the AVS-SEM analysis indicated that the metals in most of the samples are potentially bioavailable based on this measure, because the simultaneously extracted metals (SEM) concentrations were greater than the acid volatile sulfide (AVS) concentrations; AVS was only detected in 3/9 samples. Therefore, metals are potential chemicals of ecological concern at the site. It is important to note, however, that the relatively high TOC levels in some of the sediment samples, especially in Deerfield Pond (3.9 to 5.8 percent TOC) will decrease the bioavailability of the metals. Finally, although several metals were detected at concentrations that exceeded screening levels, lead is the metal of greatest ecological concern at the site because many of the detections were well above the screening level (i.e., by an order or magnitude) in several samples.

8.6.2.2 Surface Water

Bis(2-ethylhexyl)phthalate was retained as a COPC because the maximum concentration exceeded the screening level (Table 8-3). The concentrations of this chemical exceeded the screening level in all seven samples in which it was detected, however, most of the detections were similar to the reporting

limits. Therefore, although adverse impacts to ecological receptors are possible, there is uncertainty in whether bis(2-ethylhexyl)phthalate is actually present in the surface water.

4,4'-DDE and 4,4'-DDT were retained as COPCs because their maximum concentrations exceeded the screening levels (Table 8-3). These chemicals were only detected in the surface water at a single sample location (DA-A-SW02). None of the samples downstream had detections of these chemicals, indicating that contamination is localized to a small area. Therefore, any risks associated with these pesticides would be limited to a small area.

Four metals were retained as COPCs because their maximum detections exceeded screening levels (aluminum, barium, lead, and manganese). Aluminum concentrations only exceeded the screening level in two of the nine samples, while lead was only detected in one of nine samples. Therefore, any adverse impacts from these metals are not expected to be widespread. Barium and manganese concentrations exceeded the screening levels in several samples each, with the greatest concentrations in the Deerfield Pond samples. Therefore, there may be some risks to aquatic receptors from metals in the surface water, but the risks are not expected to be widespread.

8.6.3 Terrestrial Receptors

As presented in Section 8.5.1.3, the EEQs from the terrestrial food chain modeling were greater than 1.0 for several chemicals using maximum chemical concentrations and conservative exposure assumptions. Therefore, as part of the Step 3a refinement, risks were recalculated using average chemical concentrations and average exposure assumptions.

Table 8-7 presents the NOAEL and LOAEL EEQs from the terrestrial food chain models for herbivorous and insectivorous receptors using average inputs. The following bullets summarize the results for the various receptors:

- Soil herbivorous receptors: No chemicals had NOAEL EEQs greater than 1.0 using the average scenario.

- Soil insectivorous receptors: 4,4'-DDE, 4,4'-DDT, Aroclor-1254, lead, mercury, and zinc had NOAEL EEQs greater than 1.0 for the robin; Aroclor-1254 and arsenic had NOAEL EEQs greater than 1.0 for the shrew. 4,4'-DDT for the robin model was the only chemical that had a LOAEL EEQ slightly greater than 1.0 with an EEQ of 1.04.

4,4'-DDE, 4,4'-DDT and Aroclor-1254 were detected infrequently in the soil across the site (1/15, 1/15, and 2/15, respectively). Therefore, actual exposure to wildlife from those chemicals will be low so it is unlikely that these chemicals will impact birds or mammals. All of the NOAEL EEQs for the metals were less than 4.0. However, because NOAELs are no-effects levels, impacts to wildlife from chemicals with EEQs greater than 1.0 using the NOAEL, but less than 1.0 using the LOAEL, are possible since the effects level will fall somewhere between the NOAEL and LOAEL.

Table 8-8 presents the NOAEL and LOAEL EEQs from the terrestrial food chain models for piscivorous receptors using average inputs. For piscivorous receptors, 4,4'-DDE, Aroclor-1268, arsenic, lead, and mercury had NOAEL EEQs greater than 1.0; lead was the only chemical with a LOAEL EEQ greater than 1.0 with an EEQ of 1.4. The LOAEL EEQ greater than 1.0 for lead was based on the great blue heron as the receptor. Therefore, there are potential risks to piscivorous wildlife from 4,4'-DDE, Aroclor-1268 and metals in the sediment (the contribution of the dose from the chemical concentrations in the surface water is negligible). However, note that 4,4'-DDE and Aroclor-1268 were detected infrequently in the sediment.

8.7 ECOLOGICAL RISK UNCERTAINTY ANALYSIS

This section presents some of the general uncertainties associated with ecological risk assessment.

8.7.1 Uncertainty in Measurement and Assessment Endpoints

Measurement endpoints were used to evaluate the assessment endpoints that were selected for this ERA, but the measures of effects were not the same as the assessment endpoints. Therefore, the measures were used to predict effects to the assessment endpoints by selecting surrogate species that were evaluated. For example, mortality of a raccoon was used to assess mortality of the small mammal population. However, predicting mortality to a raccoon may either under or overprotect the small mammal population, resulting from differences in ingestion rates, toxicity, food preferences, etc., between the different species.

Several endpoints were not quantitatively evaluated in the ERA. For example, risks to reptiles and amphibians were not quantitatively evaluated because exposure factors are not established for most species, and toxicity data are very limited.

8.7.2 Uncertainty in Exposure Characterization

The contaminant dose to terrestrial wildlife is calculated using an equation that incorporates ingestion rates, body weights, bioaccumulation factors, and other exposure factors. These exposure factors are

obtained from literature studies or predicted using various equations. Ingestion rates and body weights vary between species, especially between species inhabiting different areas.

Bioaccumulation of contaminants into various biological media (i.e., plants, invertebrates, small mammals) depends on characteristics of the media such as pH, organic carbon, etc. The bioaccumulation factors that were used for the ERA came from a variety of sources, as indicated in Appendix G.4. All the values were from the literature because no site-specific values are available. There are uncertainties associated with accumulation factors from the literature because they may either under predict of over predict tissue concentrations, depending upon how representative the factors are for site conditions. For the organic chemicals, adjustments are made for differences in percent lipid values for fish which helps decrease some of the uncertainties.

The greatest exposure to piscivorous birds and mammals to chemicals in the sediment would be from fish in Deerfield Pond because the relatively small size of the streams discharging to Deerfield Pond would limit the numbers of fish in those streams. The TOC in the pond is relatively high, ranging from 3.9 to 5.8 percent, which will tend to decrease the bioavailability of the metals. Also, based on sulfide solubility products (the tendency for the trace metal to bond with sulfide), the most insoluble metal sulfide of the SEM metals is copper sulfide, followed by lead sulfide, cadmium sulfide, zinc sulfide and nickel sulfide (Ankley et al., 1996). Therefore, lead in two of the sediment samples from Deerfield Pond is unlikely to be available because the sum of the copper and lead SEM concentrations is less than the total AVS concentration. Lead in the third sample (DA-S-SD07), however, is potentially bioavailable, because the sum of the copper and lead SEM concentration (2.1 umol/g) is slightly greater than the AVS concentration in that sample (0.97 umol/g). As discussed above, however, the high TOC in that sample (3.9%) will tend to make the metals less bioavailable.

8.7.3 Uncertainty in Ecological Effects Data

Uncertainty exists in the ecological effects data, including the screening levels and wildlife TRVs. As discussed in Section 8.6, several of the screening levels are very conservative, and in some cases are below background levels. Therefore, their utility in evaluating potential risks for those chemicals is somewhat limited. For example, the screening level for chromium in soil is 0.4 mg/kg, which is well below background levels. Also, although the surface water screening level for barium is 4 ug/L, the Gold Book (USEPA, 1986)indicates that the physical and chemical properties of barium generally will preclude the existence of the toxic soluble form under usual marine and fresh water conditions, so a restrictive criterion for aquatic life appears unwarranted. Also, the Gold Book indicates that ions of manganese are found rarely at concentrations above 1 mg/L, and the tolerance values reported range from 1.5 mg/L to over 1000 mg/L (USEPA, 1986). Thus, manganese is not considered to be a problem in fresh waters (USEPA,

1986). Assuming that all the manganese in the surface water is present are manganese ions, the maximum detected concentration of manganese in the surface water was 670 ug/L, which is below the minimum tolerance value of 1,500 ug/L.

The NOAELs/LOAELs used for the wildlife endpoints species are based on species other than the endpoint species (i.e., rats, mice, ducks). Uncertainty exists in the application of toxicity data across species because the contaminant may be more or less toxic to the endpoint species than it was to the test study species.

8.7.4 Uncertainty in Risk Characterization

The potential for adverse risks may be anticipated if an EEQ is greater than or equal to 1.0 regardless of the magnitude of the EEQ. Although the relationship between the magnitude of an EEQ and toxicity is not necessarily linear, the magnitude of an EEQ can be used as rough approximation of the extent of potential risks, especially if there is sufficient confidence in the screening level used. Uncertainty exists in how the predicted risks to a species at the sites translate into risk to the population in the area as a whole.

A range of risks were presented in the ERA to assist the risk managers in determining the appropriate actions for the area. The reason for presenting a range of risks is that there are uncertainties with each step in the risk assessment process.

8.8 SUMMARY/CONCLUSIONS

This section presents a summary of the conclusions of the ecological risk assessment that was conducted for the site.

8.8.1 Risks to Terrestrial Plants and Invertebrates

PAHs and select metals (arsenic, cobalt, copper, lead, and zinc) are the chemicals determined to be the primary risk drivers for this receptor group at the site. VOCs were not selected as chemicals of ecological concern that warrant further evaluation at this site because they are not expected to impact plants and invertebrates at the detected concentrations, and were detected infrequently across the site. SVOCs (other than PAHs), were not selected as ecological risk drivers because they were detected infrequently across the site, were accounted for by evaluating risks from PAHs, and/or lacked toxicity data. The three pesticides detected in the soil were not considered chemicals of ecological concern for further evaluation at the site because they were detected infrequently in the soil and were surrounded by nearby samples in

which those pesticides were not detected. Finally, aluminum and iron are typically not considered to be toxic to terrestrial plants or invertebrates because their bioavailability is low and the maximum detections of chromium, mercury, and vanadium were not greater than soil benchmarks that were developed to protect plants and invertebrates. Therefore, although PAHs and the select metals are the chemicals considered as the primary risk drivers, risks from other chemicals are possible.

8.8.2 Aquatic Organisms

PAHs, PCBs, and lead are the chemicals determined to be the primary risk drivers for this receptor group at the site. VOCs were not selected as chemicals of ecological concern that warrant further evaluation at this site because they are not expected to impact aquatic receptors at the detected concentrations, were not site-related, or were detected infrequently across the site. The SVOCs (other than PAHs) were either not site-related, not widespread across the site, and do not have toxicity data that can be used to evaluate those chemicals. The two pesticides with concentrations that exceeded the screening levels are not widespread across the site and do not appear to be significant chemicals of ecological concern. Finally, although several metals were detected at concentrations that exceeded screening levels, lead was identified as the metal of greatest ecological concern at the site because many of the detections were well above the screening level (i.e., by an order or magnitude) in several samples.

Finally, bis(2-ethylhexyl)phthalate, 4,4'-DDE and 4,4'-DDT, aluminum, barium, lead, and manganese were detected in the surface water at concentrations that exceeded their respective screening levels. Therefore, adverse impacts to ecological receptors are possible. However, there is uncertainty in whether bis(2-ethylhexyl)phthalate is actually present in the surface water because of its low detections, and the two pesticides and lead were only detected in 1/9 samples each. Therefore, any impacts from those chemicals will not be widespread. As discussed in Section 8.7.4, impacts to aquatic receptors from barium and manganese in the surface water at the detected concentrations are unlikely.

8.8.3 Terrestrial Receptors

No chemicals had NOAEL EEQs greater than 1.0 using the average scenario for herbivorous receptors. Therefore, risks are negligible for those receptors.

Based on the less conservative exposure assumptions:

- 4,4'-DDE, 4,4'-DDT, Aroclor-1254, lead, mercury, and zinc had NOAEL EEQs greater than 1.0 for the robin
- Aroclor-1254 and arsenic had NOAEL EEQs greater than 1.0 for the robin

- 4,4'-DDT for the robin model was the only chemical that had a LOAEL EEQ slightly greater than 1.0 with an EEQ of 1.04.

The actual exposure to wildlife of 4,4'-DDE, 4,4'-DDT and Aroclor-1254 will be low because they were detected infrequently so it is unlikely that these chemicals will impact birds or mammals. Impacts to wildlife from metals with EEQs greater than 1.0 using the NOAEL, but less than 1.0 using the LOAEL, are possible since the effects level will fall somewhere between the NOAEL and LOAEL.

For piscivorous receptors, 4,4'-DDE, Aroclor-1268, arsenic, lead, and mercury had NOAEL EEQs greater than 1.0; lead was the only chemical with a LOAEL EEQ greater than 1.0 with an EEQ of 1.4. Therefore, there are potential risks to piscivorous wildlife from 4,4'-DDE, Aroclor-1268 and metals in the sediment. 4,4'-DDE and Aroclor-1268 were detected infrequently in the sediment, however, so risks may be limited for these chemicals.

9.0 SUMMARY AND CONCLUSIONS

This section presents a summary of the Study Area Screening Evaluation as described in this report. The first steps of a conceptual site model are also presented, based on the data hat has been collected to date.

9.1 FINDINGS OF THE INVESTIGATION

The site has been divided into seven major areas as described in Section 3. These areas are depicted on Figure 3-1 of this report.

North Meadow
South Meadow
Paved Gated Storage Area
Paved Open Storage Area
Deerfield Stream and Wetlands
Unnamed Stream
NUWC Pond (Deerfield Pond)

9.1.1 Site Conditions

The NUWC Pond is an historic farm pond, formed in a basin area at a significantly lower elevation than the northeastern and southwestern uplands that form its two sides. A concrete dam and spillway are present at the northern end of the pond. The impoundment area varies from approximately 1 to 2 acres depending on the amount of surface water available. Depth is approximately 10 feet near the dam, shoaling gradually to the south. The lowlands to the south of the pond include wetland and stream habitat associated with the confluence of the unnamed stream and Deerfield Creek.

Water flows into the pond from Deerfield Creek from the southwest and the unnamed stream from the Wanumetonomy Golf Course to the east (Figure 3-1). In addition, storm water is discharged to the basin through outfalls from the NUWC facility storm drain network. The two streams are generally shallow (ranging from a few inches to 20 inches in depth) and typically range from 2 to 4 feet in width. The stream substrates are a combination of boulder, cobble, gravel and sand. It is apparent, based on field observations, that there are high flow conditions in the stream channels that have scoured and removed much of the fines from the streambeds. The fines have been deposited in the low gradient end of the streams and pond.

The majority of the upland portion of the site is a materials storage area, constructed on fill. The fill has been placed on the east side of a stream valley formed by Deerfield Creek between the 1950s and 1988. Fill is predominant in the south meadow and under the paved storage areas, between improved ground surface to a maximum depth of approximately 15 feet below ground surface. Fill is thicker toward the west of the site and at the Deerfield Creek. Some fill is present on the fringe areas of the North meadow, however, the fill in this area appears to be limited to the embankments near the unnamed stream, and the wetland system to the west.

The fill has been found to consist of largely soil, interspersed with solid materials including primarily construction debris (asphalt; brick; coal ash; concrete blocks, slabs and curbing with rebar; corroded 55-gallon drums and 5-gallon containers with tar-like contents; fiberglass; mesh screens; metal cans, pipes, and strapping; nails; plastic; rubber hoses; steel cables and frames; and wire) and/or natural soil or rock (silt, sand, gravel, and weathered bedrock fragments). Most notable contents of fill were a large amount of what appear to be decomposed pressurized spray cans, near the southernmost corner of the site, and drum(s) containing a tar-like substance, at the center of the South Meadow.

There is a shallow overburden layer, underlain by weathered, fractured bedrock. The overburden geology beneath the NUSC Disposal Area consists of fill and two unconsolidated geologic units: a silt, sand, and gravel unit; and glacial till. Overburden thickness ranges from approximately 2 feet (TP09, TP12B, SB07, North Meadow) to 15 feet (MW04B, South Meadow).

A unit of silt and sand with variable amounts of gravel was encountered beneath the fill in some areas. This unit consists of brown to gray brown fine-grained deposits of silt; fine-to-coarse grained deposits of silty sand, sand, gravelly sand; and coarser deposits of silty sandy gravels, cobbles, and boulders. Its thickness across the site ranges from approximately 1.5 feet to 8.5 feet.

The till material is identified as a dense, heterogeneous mixture of clay, silt, sand, coarse subangular to angular gravel, cobbles, boulders, and rock fragments. This unit was encountered beneath the silt and sand unit and above bedrock in some areas. This lower layer appears to be discontinuous across the site and ranges from approximately 0.5 feet to 5.5 feet thick.

Bedrock core samples indicate the site is underlain by a light to dark-gray colored, fine-grained metamorphosed rock, characterized as slate/phyllite. A pitted texture was observed in both of the rock units at various depths. The resultant pits or the fractures along the phyllite/quartz schist contact are likely to carry water freely.

The upper 5 feet of bedrock is significantly weathered and degraded. Fractures were observed to be in horizontal, low-angle, high angle, and vertical orientations. During rock coring, drilling water was lost into the formation at various intervals, likely through the intervals of soft degraded rock or fractures.

Groundwater at the site appears to flow south-east to north-west (downgradient toward Narragansett Bay), but with a strong local westerly draw, towards the stream valley. This directional flow is supported by the obvious surface gradient. However, there is little or no overburden aquifer, due to the shallow bedrock condition, and the highly fractured nature of the bedrock. Precipitation is likely to percolate through the overburden into the bedrock through the fractures in the weathered intervals. The hydraulic gradient described in this report does not take into account the likely path of groundwater once within the bedrock fractures. For this site, the bedrock hydraulic conductivity is estimated between 1 foot per day (MW02B) and 5 feet per day (MW04B). Large fractured zones in MW03 indicate even higher hydraulic conductivities.

9.1.2 Receptors

Habitats dispersed throughout and adjacent to the site are characteristic of fragmented, developed landscapes of lightly industrialized/commercial areas in the New England region. Approximately 30 percent of the study area is covered by pavement, with the remaining area providing some habitat value. The minimal quality habitat (NETC facility and golf course) surrounding the study area limit the range of terrestrial, wetland, and avian wildlife species expected to utilize the site. However, the dense vegetation in the basin and uplands in the area do provide cover, foraging, and breeding/nesting areas for birds, mammals, reptiles, and amphibians that do not require large home ranges. The pond and streams provide a local important freshwater source for wildlife. Additionally, migratory birds are expected to utilize this area for resting and foraging during migration.

Access to the site is limited as a secured naval facility, and therefore receptors are limited to industrial and commercial type worker scenarios. While the security road is sometimes used as a walking path for employees, persons are restricted from the storage area portions of the site unless working in that area, moving and accessing stored materials.

9.1.3 Contaminants Found

Contaminants were found at the site exceeding Federal and State criteria and risk benchmarks. Contaminants detected at the site that are in excess of these criteria are summarized on Table 9-1. Major findings of the SASE are depicted on Figure 9-1, as described in this subsection. The most predominant and consistent contaminants exceeding criteria were lead, arsenic, PAHs and TCE.

Concentrations of arsenic in the soil appear to be ubiquitous across the site, independent of the location of fill. Elevated concentrations of arsenic have been documented at other sites on Navy property, and have prompted background studies to determine appropriate background conditions for arsenic. A study to determine background conditions for metals at this site is needed, but has not yet been conducted as of the publication date of this SASE report.

Based on the data gathered, it is presumed that the other contaminants are associated with the fill at the site. Although the fill does appear to be continuous through the southern portions of the site, the nature of the fill is variable, with oily soils present in some areas, clean fill present in some areas, and drums present in other areas.

One item of note is that while TCE was detected at a relatively high concentration in the groundwater, cross gradient of the fill area, TCE was not found in high concentrations in the soil at the site. The TCE found in the downgradient well is likely to have traveled to that point through a large water-bearing fracture in the bedrock, found during the drilling of this well. The origin of the TCE release may be some distance away, considering how chlorinated solvents tend to move through bedrock, and considering the absence of this contaminant elsewhere at the site. The drums present near MW01B could have once been a source of this material (at least two remain in the ground at the site, and their contents have not been characterized), or TCE could have been released in another location either not yet found, or from an upgradient source.

9.1.4 Risk Evaluations

The screening level human health risk evaluation found that contaminants within soil and sediment on site are present at concentrations in excess of the screening criteria for the industrial and commercial workers exposure scenario (current scenario). Contaminants exceeding the criteria in sediment included PAHs, arsenic, lead and manganese. Contaminants exceeding the criteria for both surface soil (0-1 foot) and deeper soil (0-15 feet) included PAHs and arsenic only.

The screening assessment also found that contaminants within groundwater and surface water are in excess of the screening criteria for residential exposure scenario (applicable only to downstream properties). Contaminants exceeding the residential criteria for groundwater included VOCs (trichloroethene and tetrachloroethene), arsenic, cadmium, and manganese. Contaminants exceeding the criteria for surface water included dieldrin, manganese, molybdenum, and thallium.

The first steps of the ecological risk assessment indicate that a risk of adverse effects from contaminant exposures may be posed to terrestrial plants, invertebrates, aquatic organisms, and piscivorous terrestrial receptors. Dominant in the contaminant group that pose this potential risk are the PAHs, PCBs, and some metals, mainly lead. Infrequent detections of the PCBs and some of the metals indicate a lower actual risk of exposure to these receptors. However, PAHs and lead, which are more prevalent at the site, may pose a more likely risk of exposure. Based on data collected to date, lead features the greatest possible risk as it poses the highest exposure quotient for aquatic receptors, and also a higher exposure quotient for the piscivorous receptors (those that prey on fish) than the other contaminants. This connection may be particularly important at this site, where a healthy fish population appears to be present in the pond, and because herons which prey on these fish were found to be nesting in trees at the site.

9.2 CONCEPTUAL SITE MODEL

The conceptual site model is a generalized illustration of the manner in which contaminants can interact with different media at the site and downstream receptors. The conceptual site model is taken to additional steps, if necessary, in the ecological and human health risk assessments. For the purposes of this SASE, the conceptual site model is based on what is currently understood about the possible contaminant origination points, and plausible transport mechanisms between media.

Figure 9-2 presents a First Tier Conceptual Site Model for the NUSC Disposal area. Data collected for this SASE indicates that fill, containing different types of contaminants has been placed at the site. Some of these contaminants have, over time, been released from the fill through leaching or percolation, and have moved from the fill areas to the stream and to the groundwater. Other contaminants within the fill have not been released, due to the inherent nature of those contaminants to be resistant to chemical change or physical movement.

A second tier model would show actual flow paths of contaminants to specific receptors. Data gathered to date shows two possible contaminant flow paths. The first path is the leaching or erosion of lead contaminants from the fill area near TP14 at the south end of the site into Deerfield Creek, and lead being deposited in the wetland area and upper portion of Deerfield Pond. The second possible path is the apparent transport of TCE through the bedrock to the west bank of Deerfield Pond. Based on data available to date, it is likely that TCE has found a preferential pathway from the release area through fractures in the bedrock and is being released to the pond with the groundwater. However, the source of the TCE is not yet determined, and may be part of the fill not yet characterized, an unknown discharge point, or an upgradient source. Additional investigations will be required to make this determination.

9.3 CONCLUSIONS

The Study Area Screening Evaluation was conducted to determine if contaminants were present at concentrations exceeding risk based standards, and to determine if additional investigations are necessary under the Installation Restoration program.

As described in Section 4 of this report, contaminants are present in excess of screening criteria. As described in Section 5 of this report, some of those contaminants, particularly lead and TCE have moved downgradient from the fill. These contaminants appear to have been released to the stream environment from the fill and from the bedrock aquifer. As described in Sections 7 and 8 of this report, contaminants in soil, sediment and groundwater exceed risk screening criteria which are applicable based on the current uses of the site.

Based on these findings, two conclusions are made. First, limited removal actions may be considered to remove contaminants (lead in soil and sediment, TCE in groundwater, and drums) posing a current threat of release to the downstream environments, including NUWC Pond and Narragansett Bay. Secondly, additional evaluations will be needed to complete a remedial investigation and baseline human and ecological risk assessments. These evaluations will be used to determine the need for a permanent remedy for the site.

TABLES

TABLE 2-1
SAMPLE SUMMARY
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

	SURFACE WATER	SEDIMENT	TEST PIT		SOIL BORINGS	GROUNDWATER
SAMPLE ID	DA-A-SW01-01	DA-S-SD01-01	DA-S-TP01-0001-01	DA-S-TP10-0001-01	DA-S-SB01-0102-01	DA-A-MW01B-01
	DA-A-SW02-01	DA-S-SD02-01	DA-S-TP01-0304-01	DA-S-TP10-0102-01	DA-S-SB01-5575-01	DA-A-MW-DUP08-01
	DA-A-SW-DUP01-01	DA-S-SD-DUP01-01	DA-S-TP01-0607-01	DA-S-TP11-0001-01	DA-S-SB01-0809-01	DA-A-MW02B-01
	DA-A-SW03-01	DA-S-SD03-01	DA-S-TP02-0001-01	DA-S-TP11-0203-01	DA-S-SB02-0102-01	DA-A-MW03B-01
	DA-A-SW04-01	DA-S-SD04-01	DA-S-TP02-0102-01	DA-S-TP-DUP03-01	DA-S-SB02-0304-01	DA-A-MW04B-01
	DA-A-SW05-01	DA-S-SD05-01	DA-S-TP02-0203-01	DA-S-TP11-0304-01	DA-S-SB02-5565-01	
	DA-A-SW06-01	DA-S-SD06-01	DA-S-TP-DUP02-01	DA-S-TP12-0001-01	DA-S-SB03-0102-01	
	DA-A-SW07-01	DA-S-SD07-01	DA-S-TP02-0506-01	DA-S-TP12-0102-01	DA-S-SB03-0304-01	
	DA-A-SW08-01	DA-S-SD08-01	DA-S-TP05-0001-01	DA-S-TP12-0203-01	DA-S-SB03-0607-01	
	DA-A-SW09-01	DA-S-SD09-01	DA-S-TP05-0607-01	DA-S-TP12A-0001-01	DA-S-SB04-0102-01	
			DA-S-TP05-0910-01	DA-S-TP12B-0001-01	DA-S-SB04-2535-01	
			DA-S-TP-DUP01-01	DA-S-TP13-0001-01	DA-S-SB04-0910-01	
			DA-S-TP06-0001-01	DA-S-TP13-0203-01	DA-S-SB-DUP06-01	
			DA-S-TP06-0304-01	DA-S-TP13-0405-01	DA-S-SB05-0102-01	
			DA-S-TP06-0010-01	DA-S-TP14-0001-01	DA-S-SB05-0203-01	
			DA-S-TP07-0001-01	DA-S-TP14-0506-01	DA-S-SB05-0304-01	
			DA-S-TP07-0304-01	DA-S-TP14-0910-01	DA-S-SB06-0515-01	
			DA-S-TP07-0910-01	DA-S-TP15-0001-01	DA-S-SB06-2535-01	
			DA-S-TP08-0001-01	DA-S-TP15-0203-01	DA-S-SB07-0102-01	
			DA-S-TP08-0304-01	DA-S-TP15-0506-01	DA-S-SB08-0102-01	
			DA-S-TP-DUP05-01	DA-S-TP15A-0203-01	DA-S-SB08-0607-01	
			DA-S-TP08-0708-01	DA-S-TP15A-0506-01	DA-S-MW-DUP07-01	
			DA-S-TP09-0001-01	DA-S-TP15A-0910-01	DA-S-MW04B-0810-01	
			DA-S-TP-DUP04-01		DA-S-MW04B-1416-01	
			DA-S-TP09-0102-01			
TOTAL SAMPLES	10	10	48		24	5

(1) Last four digits for test pit and soil boring ID represent depth in feet of the sample below ground surface.

TABLE 2-2
TEST PIT EXCAVATIONS
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

TEST PIT ID	LOCATION	TOTAL DEPTH (Feet bgs)	REASON TO STOP EXCAVATION	PURPOSE OF TEST PIT
TP01	Southeastern boundary of NUSC Disposal Area.	6	Collapsing sidewalls	Assess soil quality in area downgradient of disposal area.
TP02	In the center portion of the site, north of the paved storage area and just south of the disposal area.	6	Possibility of cross-contaminating the water table	Assess soil quality in area where trichloroethene was reported in the soil gas data.
TP05	In the center portion of the site, just north of the paved storage area.	10.5	Water table	Assess soil quality disposal area identified by the IAS.
TP06	South of the unnamed stream and the IAS determined disposal area.	10	Water table	Assess soil quality disposal area identified by the IAS.
TP07	South of the unnamed stream and the IAS determined disposal area.	10	Collapsing sidewalls	Assess soil quality in IAS determined disposal area and in area where trichloroethene was reported in the soil gas data.
TP08	South of the unnamed stream and the IAS determined disposal area.	8	Impenetrable fill (concrete curbs with rebar)	Assess soil quality disposal area identified by the IAS.
TP09	Northeast bank of unnamed stream and at edge of the IAS determined disposal area.	3	Bedrock	Assess soil quality disposal area identified by the IAS.
TP10	Northeast bank of unnamed stream and at edge of the IAS determined disposal area.	3	Bedrock	Assess soil quality disposal area identified by the IAS.
TP11	Northwest portion of the north meadow on the NUWC Pond embankment.	4.5	Bedrock	Assess soil quality in area where trichloroethene was reported in the soil gas data.
TP12	Northeast bank of unnamed stream and at eastern edge of the IAS determined disposal area.	6	Bedrock	Assess soil quality disposal area identified by the IAS.
TP12A	Northeast bank of unnamed stream and at eastern edge of the IAS determined disposal area.	4	Bedrock	Assess based on strong signals from a metal detector, at RIDEM's request and approval by the Navy.

TABLE 2-2 (cont.)
TEST PIT EXCAVATIONS
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

TEST PIT ID	LOCATION	TOTAL DEPTH (Feet bgs)	REASON TO STOP EXCAVATION	PURPOSE OF TEST PIT
TP12B	Northeast bank of unnamed stream and at eastern edge of the IAS determined disposal area.	2.5	Bedrock	Assess based on strong signals from a metal detector, at RIDEM's request and approval by the Navy.
TP13	Along the top of the slope of the north meadow on the north end of the site.	7	Bedrock	Assess soil quality in northern area of plateau.
TP14	In the south portion of the paved open storage area, on the bank of Deerfield Creek.	10.5	Water table	Assess soil quality in area where BTEX were reported in the soil gas data, and near a quantity of metal containers present stream embankment.
TP15	In swale adjacent to paved storage area and east of Deerfield Creek.	6	Impenetrable fill (concrete slab)	Assess soil quality in swale and the area receiving runoff from paved portion of disposal
TP15A	In swale adjacent to paved storage area and east of Deerfield Creek.	10	Collapsing sidewalls	Assess based on strong signals from a metal detector, at RIDEM's request and approval by the Navy.

Note:

bgs = below ground surface

TABLE 2-3
SOIL BORING/WELL INSTALLATIONS
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

WELL/BORING NUMBER	LOCATION	WELL SCREEN INTERVAL	PURPOSE OF WELL
MW01B	In the center portion of the site, just northwest of test pit location TP02.	10 to 40 feet	Assess groundwater quality immediately downgradient of area where trichloroethene was reported in the soil gas data.
MW02B	In the south portion of the paved open storage area, east of Deerfield Creek.	7 to 45 feet	Assess groundwater quality immediately downgradient of area where BTEX were reported in the soil gas data.
MW03B	Northwest portion of the NORTH MEADOW on the NUWC Pond embankment and adjacent to test pit location TP11.	4 to 24 feet	Assess groundwater quality immediately downgradient of area where trichloroethene was reported in the soil gas data.
MW04B	Northwest of paved storage area and adjacent to test pit location TP01.	15 to 45 feet	Assess downgradient groundwater impact of area northwest of storage area and soil quality in area downgradient of disposal area.
SB01	In paved gated storage area where test pit (TP01) was proposed in Work Plan.	None installed*	To replace proposed test pit in paved storage area to determine impacts of potential wastes to soils.
SB02	In paved gated storage area where test pit (TP02) was proposed in Work Plan.	None installed*	To replace proposed test pit in paved storage area to determine impacts of potential wastes to soils.
SB03	At southeast corner of the site, outside of the gated storage area.	None installed*	Assess soil quality in area where undecane, tridecane and pentacane were reported in the soil gas data.
SB04	In paved gated storage area, south of SB01.	None installed*	Assess soil quality in area where BTEX were reported in the soil gas data.
SB05	In the north portion of the paved open storage area, east of Deerfield Creek.	None installed*	Assess soil quality in area where undecane, tridecane and pentacane were reported in the soil gas data.
SB06	In the north portion of the paved gated storage area.	None installed*	Assess soil quality in area where undecane, tridecane and pentacane were reported in the soil gas data.
SB07	In the center of the north meadow, east of test pit location TP11.	None installed*	Assess soil quality in area in center of plateau.
SB08	In the south portion of the paved open storage area, east of Deerfield Creek, adjacent to MW02B.	None installed*	Assess soil quality immediately downgradient of area where BTEX were reported in the soil gas data.

* No overburden aquifer was identified, therefore no well screens were installed at these locations.

TABLE 3-1
GROUNDWATER DEPTHS AND ELEVATIONS
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Well Number or Piezometer	Measurement		Elevation of Reference Point	Depth to Groundwater	Distance to Surface Water	Elevations of Water	
	Date	Time				Ground-water	Surface Water
MW-01B	12/17/2003	1316	52.53	11.08	NA	41.45	NA
MW-02B	12/17/2003	1348	51.26	4.05	NA	47.21	NA
MW-03B	12/17/2003	1320	47.19	21.66	NA	25.53	NA
MW-04B	12/17/2003	1312	48.78	15.89	NA	32.89	NA
DP-02	12/17/2003	1405	29.0	3.61	2.73	25.39	26.27
DP-03	12/17/2003	1410	28.5	2.70	NA	25.8	NA
DP-04	12/17/2003	1339	38.0	5.32	NA	32.68	NA
DP-05	12/17/2003	1334	35.0	2.89	2.88	32.11	32.12
DP-06	12/17/2003	1330	27.0	4.15	NA	22.85	NA
DP-07	12/17/2003	1322	24.9	3.85	NA	21.05	NA
DP-08	12/17/2003	1418	26.9	2.70	2.7	24.2	24.2
DP-09	12/17/2003	1414	28.2	2.85	2.52	25.35	25.7

Notes: All elevations are measured in feet NGVD
Co-located surface water only available at DP-02, DP-05, DP-08 and DP-09

TABLE 3-2
HYDRAULIC CONDUCTIVITY
NUSC DISPOSAL AREA
DRAFT STUDY AREA SCREENING EVALUATION
NUWC, MIDDLETOWN, RHODE ISLAND

Well ID	Well Casing Inside Dia. (in)	Borehole Dia. (in)	MP	Stickup [1] (ft)	Depth to Groundwater [2] (ft-BMP)	Depth to Groundwater [2] (ft-BGS)	Depth to confining layer [3] (ft-BGS)	Depth to top of well screen [1] (ft-BGS)	Depth to bottom of well screen [1] (ft-BGS)	Materials Opposite Well Screen	Estimated Hydraulic Conductivity (feet/day) [4,5]
MW01B	1	3	TPVC	3.00	11.49	8.49	10.00	10.00	39.00	slate/phyllite	2.0
MW02B	1	3	TPVC	-0.50	4.34	4.84	6.00	6.80	44.80	slate/phyllite	1.0
MW03B	1	3	TPVC	2.52	20.98	18.46	4.00	4.00	24.00	slate/phyllite	IR
MW04B	1	3	TPVC	0.65	16.31	15.66	15.00	15.00	45.00	slate/phyllite	5.0

References:
1) Data from well construction log.
2) Measured on September 5, 2003.
3) Data from geologic log.
4) Cooper, Bredehoeft, and Papadopulos (1967) method.
5) Slug addition by pouring was not approximately instantaneous, which is an assumption that must be met in order to calculate hydraulic conductivity using this method.

MP = measuring point.

TOWC = Top of well casing.

BMP = below measuring point.

BGS = below ground surface.

IR = Insufficient Response.

TABLE 4-1
SUMMARY OF ANALYTICAL RESULTS - SURFACE WATER
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN RHODE ISLAND

Sample Number			DA-A-SW01-01	DA-A-SW02-01	DA-A-SW-DUP01-01	DA-A-SW03-01	DA-A-SW04-01
Sample Location			SW01	SW02	SW02	SW03	SW04
Date Sampled			7/31/2003	7/30/2003	7/30/2003	7/30/2003	7/31/2003
Interval			0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0
QC Identifier			None	Field Dup. DA-A-SW02-01	Field Dup. DA-A-SW02-01	None	None
Criteria	AWQC_CCC Freshwater	MCL					
Volatile Organic Analysis (UG/L)							
1,1,1-Trichloroethane		200	--	2.4 J	2.4 J	1.5 J	--
1,1-Dichloroethane			--	1.6 J	1.6 J	1 J	--
Semivolatile Organic Analysis (UG/L)							
bis(2-Ethylhexyl)phthalate		6	--	3.8 J	3.8 J	3.9 J	--
Pesticide/PCB Analysis (UG/L)							
4,4'-DDE			--	0.014 J	0.0138 J	--	--
4,4'-DDT	0.001		--	--	0.0348 J	--	--
Dieldrin	0.056		0.013 J	0.0137 J	0.0299 J	0.0158 J	--
Total Metal Analysis (UG/L)							
Aluminum	87		36.0 J	--	--	350	42.0 J
Arsenic	150	10	--	1.67 J	--	2.17 J	1.77 J
Barium		2000	4.5	6.0	5.9	7.9	3.7
Calcium			32000	37000	36000	36000	23000
Chromium	74	100	--	--	--	--	--
Cobalt			--	--	--	2.5	--
Copper	9	1300	--	--	--	2.6 J	--
Iron			310	120	140	650	150
Lead	2.5	15	--	--	--	11.3	--
Magnesium			9200	8600	8500	8500	8600
Manganese			180	15.0	19.0	120	54.0
Mercury	0.77	2	--	--	0.012 J	0.018 J	--
Molybdenum			63.0	75.0	72.0	81.0	--
Nickel	52		2.67 J	--	2.41 J	3.44 J	2.65 J
Potassium			4100	4600	4400	4600	2800
Sodium			39000 J	49000	48000	48000	14000 J
Thallium		2	--	--	--	--	3.53 J
Zinc	120		--	--	--	8.5 J	--
Dissolved Metal Analysis (UG/L)							
Aluminum	87		54.0	--	--	370	37.0 J
Arsenic	150	10	--	--	--	--	--
Barium		2000	4.7	6.3	5.8	7.8	3.4
Calcium			32000	36000	36000	35000	22000
Chromium	74	100	--	--	--	1.2 J	--
Cobalt			--	--	--	2.6	--
Copper	9	1300	4.2 J	--	--	2.8 J	--
Iron			350	130	180	720	150
Lead	2.5	15	--	--	--	12.4	--
Magnesium			9300	8400	8500	8100	8200
Manganese			190	15.0	19.0	140	53.0
Mercury	0.77	2	--	--	0.014 J	--	--
Molybdenum			64.0	72.0	71.0	78.0	--
Nickel	52		2.55 J	2.29 J	11.8	3.16 J	2.36 J
Potassium			4200	4500	4400	4600	2600
Sodium			40000	48000	47000	48000	13000
Zinc	120		5.5 J	--	--	9.2	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-1 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SURFACE WATER
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN RHODE ISLAND

Sample Number			DA-A-SW05-01	DA-A-SW06-01	DA-A-SW07-01	DA-A-SW08-01	DA-A-SW09-01
Sample Location			SW05	SW06	SW07	SW08	SW09
Date Sampled			7/30/2003	7/29/2003	7/29/2003	7/29/2003	7/29/2003
Interval			0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0
QC Identifier			None	None	None	None	None
Criteria	AWQC_CCC Freshwater	MCL					
Volatile Organic Analysis (UG/L)							
1,1,1-Trichloroethane		200	1.5 J	0.92 J	--	--	--
1,1-Dichloroethane			1.2 J	0.7 J	--	--	--
Semivolatile Organic Analysis (UG/L)							
bis(2-Ethylhexyl)phthalate		6	3.6 J	3.8 J	3.8 J	3.9 J	5 J
Pesticide/PCB Analysis (UG/L)							
4,4'-DDE			--	--	--	--	--
4,4'-DDT	0.001		--	--	--	--	--
Dieldrin	0.056		--	0.0164 J	--	--	--
Total Metal Analysis (UG/L)							
Aluminum	87		--	--	--	--	190
Arsenic	150	10	--	3.09 J	--	3.8	2.86 J
Barium		2000	6.2	11.0	9.9	10.0	12.0
Calcium			36000	31000	20000	20000	20000
Chromium	74	100	--	--	--	1.3 J	1.2 J
Cobalt			1.2 J	2.3	2.0	2.4	2.9
Copper	9	1300	--	3.2 J	--	2.5 J	2.8 J
Iron			210	260	850	870	970
Lead	2.5	15	--	--	--	--	--
Magnesium			8400	7600	5400	5200	5400
Manganese			23.0	89.0	420	430	600
Mercury	0.77	2	--	0.012 J	0.013 J	--	0.015 J
Molybdenum			78.0	33.0	20.0	20.0	23.0
Nickel	52		--	2.65 J	2.91 J	3.76 J	3.87 J
Potassium			4500	4900	4000	3900	4200
Sodium			48000	44000	24000	23000	24000
Thallium		2	--	--	--	--	--
Zinc	120		--	6.4 J	4.8 J	--	5.6 J
Dissolved Metal Analysis (UG/L)							
Aluminum	87		--	--	--	--	180
Arsenic	150	10	--	--	2.43 J	2.88 J	3.04 J
Barium		2000	5.8	7.8	9.8	9.9	12.0
Calcium			34000	28000	20000	19000	20000
Chromium	74	100	--	--	--	--	1.2 J
Cobalt			1.0 J	2.0	1.8 J	1.9 J	2.8
Copper	9	1300	--	2.9 J	--	--	2.6 J
Iron			180	240	820	850	980
Lead	2.5	15	--	--	--	--	--
Magnesium			7900	6900	5400	5200	5200
Manganese			21.0	74.0	410	430	670
Mercury	0.77	2	--	0.012 J	0.013 J	0.016 J	0.016 J
Molybdenum			73.0	31.0	20.0	19.0	22.0
Nickel	52		2.62 J	2.5 J	2.42 J	2.9 J	3.83 J
Potassium			4400	4600	4100	4100	4300
Sodium			47000	41000	24000	24000	24000
Zinc	120		--	--	--	--	4.8 J

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-2
SUMMARY OF ANALYTICAL RESULTS - SEDIMENT
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Sample Number			DA-S-SD01-01	DA-S-SD02-01	DA-S-SD-DUP01-01	DA-S-SD03-01	DA-S-SD04-01	DA-S-SD05-01	DA-S-SD06-01	DA-S-SD07-01	DA-S-SD08-01	DA-S-SD09-01
Sample Location			SD01	SD02	SD02	SD03	SD04	SD05	SD06	SD07	SD08	SD09
Date Sampled			7/31/2003	7/30/2003	7/30/2003	7/30/2003	7/31/2003	7/30/2003	7/29/2003	7/29/2003	7/29/2003	7/29/2003
Interval			0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
QC Identifier			None	Field Dup. DA-S-SD02-01	Field Dup. DA-S-SD02-01	None	None	None	None	None	None	None
Criteria	Region 9 PRG - Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Criteria: Industrial/ Commercial										
Volatile Organic Analysis (UG/KG)												
1,1,1-Trichloroethane	120000	10000000	--	2.3	0.95	--	--	1.2	1.3	--	--	--
1,1-Dichloroethane	170000	10000000	--	0.71 J	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	300000	10000000	--	--	--	--	--	--	--	--	--	6.2 J
2-Butanone	2700000	10000000	27 J	--	--	--	--	--	--	69 J	11 J	28 J
Acetone	600000	10000000	70 J	--	--	--	--	--	--	180 J	34 J	90 J
Carbon Disulfide	72000		--	--	--	--	--	--	--	--	--	2.7 J
Chloroethane	6500		1.6 J	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane	31000		66 J	25 J	2.4 J	7.7 J	--	5.4 J	--	--	14 J	28 J
m&p-Xylene			2.2 J	--	--	--	--	--	--	--	--	--
p-Isopropyltoluene			--	--	--	--	0.79 J	--	--	--	--	--
Tetrachloroethene	3400	110000	--	--	--	--	--	--	15	--	--	--
Toluene	52000	10000000	--	--	--	--	--	--	--	38 J	--	--
Trichloroethene	110	520000	--	--	--	--	--	--	14	--	--	--
Semivolatile Organic Analysis (UG/KG)												
3-Methylphenol	3100000		--	--	--	--	--	--	0.00 J	--	--	--
Acenaphthene	2900000	10000000	--	--	--	780	--	--	--	--	--	--
Anthracene	10000000	10000000	87 J	--	--	2000	--	--	--	220 J	140 J	--
Benzo(a)anthracene	2100	7800	320 J	140 J	--	3400	--	--	--	790 J	680 J	590 J
Benzo(a)pyrene	210	800	310 J	--	--	2600	--	--	--	810 J	930 J	830 J
Benzo(b)fluoranthene	2100	7800	310 J	--	--	2300	--	--	--	1000 J	1200 J	1100 J
Benzo(g,h,i)perylene		10000000	420 J	--	--	1900	--	--	--	760 J	940 J	830 J
Benzo(k)fluoranthene	21000	78000	300 J	100 J	--	2300	--	100 J	--	790 J	1000 J	870 J
Benzoic acid	10000000		1500 J	--	1100 J	1100 J	980 J	1200 J	--	1900 J	2700 J	2400 J
Benzyl Alcohol	10000000		400 J	--	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	120000	410000	--	580 J	560 J	680 J	--	570 J	--	1200 J	2300 J	2300 J
Carbazole	86000		--	--	--	1300	--	--	--	--	--	--
Chrysene	210000	780000	380 J	140 J	--	3300	--	140 J	--	1100 J	1400 J	1200 J
Dibenzo(a,h)anthracene	210	800	--	--	--	640 J	--	--	--	--	--	--
Dibenzofuran	310000		--	--	--	550 J	--	--	--	--	--	--
Diethylphthalate	10000000	10000000	--	--	--	420 J	--	--	--	1000 J	1600 J	2000
Di-n-Butylphthalate	6200000		--	--	--	100 J	--	--	--	--	--	--
Fluoranthene	2200000	10000000	710 J	280 J	140 J	8500	--	200 J	920 J	2100	2500 J	2300
Fluorene	2600000	10000000	--	--	--	1000	--	--	--	--	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
R - Rejected; NA - Not Analyzed

TABLE 4-2 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SEDIMENT
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Sample Number			DA-S-SD01-01	DA-S-SD02-01	DA-S-SD-DUP01-01	DA-S-SD03-01	DA-S-SD04-01	DA-S-SD05-01	DA-S-SD06-01	DA-S-SD07-01	DA-S-SD08-01	DA-S-SD09-01
Sample Location			SD01	SD02	SD02	SD03	SD04	SD05	SD06	SD07	SD08	SD09
Date Sampled			7/31/2003	7/30/2003	7/30/2003	7/30/2003	7/31/2003	7/30/2003	7/29/2003	7/29/2003	7/29/2003	7/29/2003
Interval			0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
QC Identifier			None	Field Dup. DA-S-SD02-01	Field Dup. DA-S-SD02-01	None	None	None	None	None	None	None
Criteria	Region 9 PRG - Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Criteria: Industrial/ Commercial										
Acid Volatile Sulfides/Simultaneously Extracted Metals Analysis (UMO/G)												
Acid Volatile Sulfide			2.120	--	--	--	--	--	--	0.9730 J	3.0700 J	23.90 J
Cadmium			--	--	--	--	--	--	0.01200	--	--	--
Chromium			0.06900	0.04800	0.04100	0.09100	0.03000	0.05800	0.1040	0.1120	0.1330 J	0.1820
Copper			0.2940	0.2970	0.2840	0.3370	0.07500	0.1880	0.4640	0.4480	0.4590 J	0.5210
Lead			0.3290	3.0300	3.0300	2.650	0.06500	0.7260	3.480	1.690	0.7330 J	0.7510
Mercury			0.008200	--	--	--	0.005800	--	--	--	--	--
Nickel			0.1140	0.1270	0.09600	0.1380	0.05400	0.08700	0.1390	0.1740	0.1450 J	0.1880
Zinc			1.590	0.5810	0.5320	1.340	0.2460	0.8750	1.340	2.150	2.0400 J	2.140
Miscellaneous Analysis (%)												
Percent Clay			7.0	6.1	6.4	3.9	2.5	3.0	2.5	5.2	11.0 J	14.0
PERCENT COARSE SILT			17.0	19.0	27.0	7.8	14.0	11.0	24.0	21.0	9.6 J	5.7
PERCENT FINE SILT			13.0	8.9	9.2	7.4	4.8	6.6	6.2	13.0	23.0 J	27.0
PERCENT MEDIUM SILT			20.0	21.0	19.0	14.0	10.0	16.0	18.0	25.0	38.0 J	38.0
Percent Sand			43.0	45.0	38.0	67.0	68.0	63.0	50.0	35.0	19.0 J	15.0
SIEVE NO. 004			0.40	--	1.3	17.0	36.0	23.0	0.60	--	--	--
SIEVE NO. 010			0.40	--	1.3	18.0	40.0	27.0	0.60	--	--	--
SIEVE NO. 040			5.1	2.5	2.3	33.0	48.0	38.0	2.8	0.70	--	--
SIEVE NO. 100			30.0	25.0	22.0	58.0	56.0	52.0	23.0	13.0	0.30 J	0.40
Total Organic Carbon			3.65	1.14	1.09	1.82	1.34	1.86	2.52	3.9	5.76 J	4.46
TOTAL SOLIDS			51.0	68.0	68.0	68.0	72.0	68.0	60.0	41.0	29.0 J	32.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
R - Rejected; NA - Not Analyzed

TABLE 4-3
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			PAVED GATED STORAGE AREA					
Sample Number			DA-S-SB01-0102-01	DA-S-SB01-5575-01	DA-S-SB01-0809-01	DA-S-SB02-0102-01	DA-S-SB02-0304-01	DA-S-SB02-5565-01
Sample Location			SB01	SB01	SB01	SB02	SB02	SB02
Date Sampled			8/19/2003	8/19/2003	8/19/2003	8/18/2003	8/18/2003	8/18/2003
Interval			1.0-2.0	5.5-7.5	8.0-9.0	1.0-2.0	3.0-4.0	5.5-6.5
QC Identifier			None	None	None	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Volatile Organic Analysis (UG/KG)								
1,2,4-Trimethylbenzene	17000		--	--	--	--	--	--
1,3,5-Trimethylbenzene	7000		--	--	--	--	--	--
2-Butanone	2700000	10000000	23	--	--	16	--	--
Acetone	600000	10000000	94 J	--	22 J	46	9.2	58
Carbon Disulfide	72000		0.95 J	--	1 J	--	--	--
Chloroform	1200	940000	0.76 J	--	--	--	--	--
cis-1,2-Dichloroethene	15000		--	--	--	--	--	--
Ethylbenzene	20000	10000000	--	--	--	--	--	--
Isopropylbenzene	200000		--	--	--	--	--	--
m&p-Xylene			--	--	0.61 J	--	--	1.8
Methylene Chloride	21000	760000	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
n-Butylbenzene	24000		--	--	--	--	--	--
n-Propylbenzene	24000		--	--	--	--	--	--
o-Xylene			--	--	--	--	--	0.71 J
p-Isopropyltoluene			--	--	--	--	--	2.5
sec-Butylbenzene	22000		0.97	1.1 J	5.2	--	--	--
tert-Butylbenzene	39000		1.1 J	--	0.54 J	--	--	--
Tetrachloroethene	3400	110000	--	--	--	2.4	--	0.64 J
Toluene	52000	10000000	--	--	--	--	--	--
Trichloroethene	110	520000	--	--	--	--	--	--
Semivolatile Organic Analysis (UG/KG)								
2,4-Dimethylphenol	1200000	10000000	--	--	--	--	--	--
2,4-Dinitrophenol	120000	4100000	--	--	--	--	--	--
2-Methylnaphthalene		10000000	--	--	--	--	--	--
3,3'-Dichlorobenzidine	3800	13000	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol			--	--	--	--	--	--
4-Nitroaniline			--	--	--	--	--	--
4-Nitrophenol	700000		--	--	--	--	--	--
Acenaphthene	2900000	10000000	--	--	--	--	--	--
Acenaphthylene		10000000	--	--	--	--	--	--
Anthracene	10000000	10000000	--	--	--	--	--	--
Benzo(a)anthracene	2100	7800	240 J	--	--	--	--	--
Benzo(a)pyrene	210	800	160 J	--	--	--	--	--
Benzo(b)fluoranthene	2100	7800	270 J	--	--	--	--	--
Benzo(g,h,i)perylene		10000000	--	--	--	--	--	--
Benzo(k)fluoranthene	21000	78000	290 J	--	--	--	--	--
Benzoic acid	10000000		--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	120000	410000	410 J	410 J	--	--	--	--
Carbazole	86000		--	--	--	--	--	--
Chrysene	210000	780000	550 J	--	--	--	--	--
Dibenzo(a,h)anthracene	210	800	--	--	--	--	--	--
Dibenzofuran	310000		--	--	--	--	--	--
Diethylphthalate	10000000	10000000	--	--	--	--	--	--
Di-n-Butylphthalate	6200000		--	--	--	--	--	--
Fluoranthene	2200000	10000000	1600	--	--	140 J	--	--
Fluorene	2600000	10000000	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	2100	7800	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
Pentachlorophenol	9000	48000	--	--	--	--	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			PAVED GATED STORAGE AREA					
Sample Number			DA-S-SB01-0102-01	DA-S-SB01-5575-01	DA-S-SB01-0809-01	DA-S-SB02-0102-01	DA-S-SB02-0304-01	DA-S-SB02-5565-01
Sample Location			SB01	SB01	SB01	SB02	SB02	SB02
Date Sampled			8/19/2003	8/19/2003	8/19/2003	8/18/2003	8/18/2003	8/18/2003
Interval			1.0-2.0	5.5-7.5	8.0-9.0	1.0-2.0	3.0-4.0	5.5-6.5
QC Identifier			None	None	None	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Phenanthrene		10000000	920	--	--	73 J	--	--
Pyrene	2900000	10000000	1200	--	--	120 J	--	--
Pesticide/PCB Analysis (UG/KG)								
4,4'-DDE	7000		--	--	--	--	--	--
4,4'-DDT	7000		--	--	--	--	--	--
alpha-Chlordane			--	--	--	--	--	--
Aroclor-1248	740		--	--	--	--	--	--
Aroclor-1254	740		--	--	--	--	--	--
Aroclor-1260	740		--	--	--	--	--	--
Aroclor-1268	1000		--	--	--	--	--	--
Toxaphene	1600		--	--	--	--	45.9 J	--
Total Metal Analysis (MG/KG)								
Aluminum	10000		7200	8700	7600	5800	5300	5200
Antimony	41	820	--	--	--	--	--	--
Arsenic	1.6	3.8	31.0	18.0	16.0	21.0 J	11.0 J	7.4 J
Barium	6700	10000	11.0	8.5	9.0	20.0	19.0	20.0
Beryllium	1900	1.3	0.40	0.28	0.29	0.41	0.50	0.38
Cadmium	45	1000	--	--	--	--	--	--
Calcium			790	1100	1000	930	590	810
Chromium	64	10000	10.0 J	13.0 J	11.0 J	8.7	6.8	9.4
Cobalt	1900		15.0	12.0	12.0	8.4	15.0	8.6
Copper	4100	10000	26.0	23.0	21.0	14.0	12.0	11.0
Iron	10000		30000	30000	26000	20000	16000	13000
Lead	750	500	11.0	8.8	7.6	22.0	7.9	9.0
Magnesium			2600 J	3100 J	2700 J	920	960	1200
Manganese	1900	10000	410	180	190	400	370	230
Mercury	31	610	--	--	--	0.0419	--	0.00808
Molybdenum			0.57	0.53	0.68	--	--	0.96
Nickel	2000	10000	24.0	24.0	23.0	10.0	8.0	10.0
Potassium			130	130	160	--	140	230
Selenium	510	10000	--	--	--	--	--	--
Silver	510	10000	0.046 J	--	--	0.82	--	--
Sodium			--	--	--	--	--	--
Thallium	6.7	140	0.18 J	0.20 J	0.28 J	0.32 J	--	--
Vanadium	720	10000	16.0	13.0	12.0	17.0	14.0	12.0
Zinc	10000	10000	58.0 J	52.0 J	48.0 J	36.0 J	23.0 J	37.0 J
Total Petroleum Hydrocarbon Analysis (UG/KG)								
Diesel Range Organics		2,500,000	39000 J	--	--	55000 J	--	37000 J
Gasoline Range Organics			730 J	1300 J	730 J	--	--	--
Miscellaneous Analysis (%)								
TOTAL SOLIDS			88.0	88.0	81.0	83.0	88.0	87.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			PAVED GATED STORAGE AREA					
Sample Number			DA-S-SB03-0102-01	DA-S-SB03-0304-01	DA-S-SB03-0607-01	DA-S-SB04-0102-01	DA-S-SB04-2535-01	DA-S-SB04-0910-01
Sample Location			SB03	SB03	SB03	SB04	SB04	SB04
Date Sampled			8/19/2003	8/19/2003	8/19/2003	8/18/2003	8/18/2003	8/18/2003
Interval			1.0-2.0	3.0-4.0	6.0-7.0	1.0-2.0	2.5-3.5	9.0-10.0
QC Identifier			None	None	None	None	None	Field Dup. DA-S-SB04-0910-01
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Volatile Organic Analysis (UG/KG)								
1,2,4-Trimethylbenzene	17000		--	--	--	--	17000	--
1,3,5-Trimethylbenzene	7000		--	--	--	--	--	--
2-Butanone	2700000	10000000	--	7.9	5.1 J	1.8 J	--	--
Acetone	600000	10000000	--	35 J	91 J	8.5	--	--
Carbon Disulfide	72000		--	--	2.4 J	--	--	--
Chloroform	1200	940000	--	--	--	--	--	--
cis-1,2-Dichloroethene	15000		--	--	--	--	--	--
Ethylbenzene	20000	10000000	--	--	--	--	1600	80 J
Isopropylbenzene	200000		--	--	--	--	2800	95 J
m&p-Xylene			--	--	1.4	--	--	--
Methylene Chloride	21000	760000	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
n-Butylbenzene	24000		190	--	1.8	--	8100	300 J
n-Propylbenzene	24000		--	--	--	--	6100	170 J
o-Xylene			--	--	--	--	--	--
p-Isopropyltoluene			290	--	2.7	--	6400	--
sec-Butylbenzene	22000		--	1.8	1.4	--	4700	180 J
tert-Butylbenzene	39000		--	1.2 J	0.93 J	--	--	--
Tetrachloroethene	3400	110000	--	--	--	--	--	--
Toluene	52000	10000000	--	--	--	--	--	--
Trichloroethene	110	520000	--	--	--	--	--	--
Semivolatile Organic Analysis (UG/KG)								
2,4-Dimethylphenol	1200000	10000000	--	--	--	--	--	--
2,4-Dinitrophenol	120000	4100000	--	--	--	--	--	--
2-Methylnaphthalene		10000000	280 J	--	--	--	--	--
3,3'-Dichlorobenzidine	3800	13000	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol			--	--	--	--	--	--
4-Nitroaniline			--	--	--	--	--	--
4-Nitrophenol	700000		--	--	--	--	--	--
Acenaphthene	2900000	10000000	--	--	--	--	--	--
Acenaphthylene		10000000	--	--	--	--	--	--
Anthracene	10000000	10000000	--	--	--	54 J	--	--
Benzo(a)anthracene	2100	7800	--	--	--	190 J	--	--
Benzo(a)pyrene	210	800	--	--	--	130 J	--	--
Benzo(b)fluoranthene	2100	7800	--	--	--	120 J	--	--
Benzo(g,h,i)perylene		10000000	--	--	--	--	--	--
Benzo(k)fluoranthene	21000	78000	--	--	--	130 J	--	--
Benzoic acid	10000000		--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	120000	410000	400 J	450 J	--	--	--	--
Carbazole	86000		--	--	--	--	--	--
Chrysene	210000	780000	--	--	--	180 J	--	--
Dibenzo(a,h)anthracene	210	800	--	--	--	--	--	--
Dibenzofuran	310000		--	--	--	--	--	--
Diethylphthalate	10000000	10000000	--	--	--	--	--	--
Di-n-Butylphthalate	6200000		--	--	--	--	--	--
Fluoranthene	2200000	10000000	--	--	--	390 J	--	--
Fluorene	2600000	10000000	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	2100	7800	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	120 J
Pentachlorophenol	9000	48000	--	--	--	--	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			PAVED GATED STORAGE AREA					
Sample Number			DA-S-SB03-0102-01	DA-S-SB03-0304-01	DA-S-SB03-0607-01	DA-S-SB04-0102-01	DA-S-SB04-2535-01	DA-S-SB04-0910-01
Sample Location			SB03	SB03	SB03	SB04	SB04	SB04
Date Sampled			8/19/2003	8/19/2003	8/19/2003	8/18/2003	8/18/2003	8/18/2003
Interval			1.0-2.0	3.0-4.0	6.0-7.0	1.0-2.0	2.5-3.5	9.0-10.0
QC Identifier			None	None	None	None	None	Field Dup. DA-S-SB04-0910-01
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Phenanthrene		10000000	--	--	--	260 J	--	--
Pyrene	2900000	10000000	--	--	--	340 J	--	--
Pesticide/PCB Analysis (UG/KG)								
4,4'-DDE	7000		--	--	--	--	--	--
4,4'-DDT	7000		--	--	--	--	--	--
alpha-Chlordane			--	--	--	--	--	--
Aroclor-1248	740		--	--	--	--	--	--
Aroclor-1254	740		--	--	--	--	--	--
Aroclor-1260	740		--	--	--	--	--	--
Aroclor-1268	1000		--	--	--	94.1	--	--
Toxaphene	1600		--	--	--	--	--	--
Total Metal Analysis (MG/KG)								
Aluminum	10000		9500	9500	9200	5200	5300	3900
Antimony	41	820	--	--	--	--	--	--
Arsenic	1.6	3.8	32.0	35.0	30.0	41.0 J	13.0 J	24.0 J
Barium	6700	10000	12.0	100	60.0	12.0	28.0	10.0
Beryllium	1900	1.3	0.40	0.72	0.68	0.31	0.35	--
Cadmium	45	1000	--	--	--	--	--	--
Calcium			690	830	740	810	430	380
Chromium	64	10000	13.0 J	12.0 J	13.0 J	7.7	9.5	7.5
Cobalt	1900		16.0	34.0	16.0	18.0	14.0	14.0
Copper	4100	10000	26.0	2.1	5.8	21.0	13.0	26.0
Iron	10000		29000	67000	43000	22000	20000	24000
Lead	750	500	15.0	16.0	13.0	12.0	7.2	7.0
Magnesium			3100 J	1400 J	1700 J	1600	1400	1400
Manganese	1900	10000	340	3300	1300	340	2000	280
Mercury	31	610	0.00821 J	0.0314 J	0.0136 J	--	--	--
Molybdenum			--	--	--	--	--	--
Nickel	2000	10000	24.0	7.5	8.6	18.0	17.0	22.0
Potassium			160	250	260	140	150	130
Selenium	510	10000	--	--	--	--	--	--
Silver	510	10000	--	0.33	0.12	0.81	--	--
Sodium			--	--	--	--	--	--
Thallium	6.7	140	0.30 J	--	--	0.38	--	0.17 J
Vanadium	720	10000	13.0	40.0	30.0	9.1	14.0	9.5
Zinc	10000	10000	54.0 J	30.0 J	30.0 J	39.0 J	34.0 J	42.0 J
Total Petroleum Hydrocarbon Analysis (UG/KG)								
Diesel Range Organics		2,500,000	14000	--	22000 J	23000 J	300000	250000
Gasoline Range Organics			43000	1800 J	19000	--	920000	41000 J
Miscellaneous Analysis (%)								
TOTAL SOLIDS			89.0	81.0	84.0	91.0	87.0	80.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			PAVED GATED STORAGE AREA			PAVED OPEN STORAGE AREA		
Sample Number			DA-S-SB-DUP06-01	DA-S-SB06-0515-01	DA-S-SB06-2535-01	DA-S-SB05-0102-01	DA-S-SB05-0203-01	DA-S-SB05-0304-01
Sample Location			SB04	SB06	SB06	SB05	SB05	SB05
Date Sampled			8/18/2003	8/18/2003	8/18/2003	8/19/2003	8/19/2003	8/19/2003
Interval			9.0-10.0	0.5-1.5	2.5-3.5	1.0-2.0	2.0-3.0	3.0-4.0
QC Identifier			Field Dup. DA-S-SB04-0910-01	None	None	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Volatile Organic Analysis (UG/KG)								
1,2,4-Trimethylbenzene	17000		--	--	--	--	--	--
1,3,5-Trimethylbenzene	7000		120 J	--	--	--	--	--
2-Butanone	2700000	10000000	--	--	2.8 J	--	10	13
Acetone	600000	10000000	--	--	25	--	33 J	140 J
Carbon Disulfide	72000		--	--	--	--	--	0.93 J
Chloroform	1200	940000	--	--	--	--	--	--
cis-1,2-Dichloroethene	15000		--	--	--	--	--	--
Ethylbenzene	20000	10000000	140 J	--	--	--	--	0.82
Isopropylbenzene	200000		210 J	--	--	--	--	0.58 J
m&p-Xylene			--	--	--	0.61 J	--	3.5
Methylene Chloride	21000	760000	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
n-Butylbenzene	24000		660 J	--	--	--	--	--
n-Propylbenzene	24000		390 J	--	--	--	--	--
o-Xylene			--	--	--	--	--	1.4
p-Isopropyltoluene			120	--	--	--	--	--
sec-Butylbenzene	22000		440 J	--	--	--	2	6.1
tert-Butylbenzene	39000		--	--	--	--	1 J	2.6 J
Tetrachloroethene	3400	110000	--	--	--	--	--	--
Toluene	52000	10000000	--	--	--	--	--	--
Trichloroethene	110	520000	--	--	--	--	--	--
Semivolatile Organic Analysis (UG/KG)								
2,4-Dimethylphenol	1200000	10000000	--	--	--	--	--	--
2,4-Dinitrophenol	120000	4100000	--	--	--	--	--	--
2-Methylnaphthalene		10000000	--	--	--	--	--	--
3,3'-Dichlorobenzidine	3800	13000	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol			--	--	--	--	--	--
4-Nitroaniline			--	--	--	--	--	--
4-Nitrophenol	700000		--	--	--	--	--	--
Acenaphthene	2900000	10000000	--	--	--	--	--	--
Acenaphthylene		10000000	--	--	--	--	--	--
Anthracene	10000000	10000000	--	--	--	--	--	--
Benzo(a)anthracene	2100	7800	--	200 J	--	--	--	580 J
Benzo(a)pyrene	210	800	--	160 J	--	--	--	--
Benzo(b)fluoranthene	2100	7800	--	180 J	--	--	--	--
Benzo(g,h,i)perylene		10000000	--	120 J	--	--	--	--
Benzo(k)fluoranthene	21000	78000	--	160 J	--	--	--	--
Benzoic acid	10000000		--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	120000	410000	--	--	--	--	410 J	--
Carbazole	86000		--	--	--	--	--	--
Chrysene	210000	780000	--	300 J	--	--	--	600 J
Dibenzo(a,h)anthracene	210	800	--	--	--	--	--	--
Dibenzofuran	310000		--	--	--	--	--	--
Diethylphthalate	10000000	10000000	--	--	--	--	--	--
Di-n-Butylphthalate	6200000		--	--	--	--	--	--
Fluoranthene	2200000	10000000	--	540 J	--	--	--	1100 J
Fluorene	2600000	10000000	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	2100	7800	--	--	--	--	--	--
Naphthalene	19000	10000000	130 J	--	--	--	--	--
Pentachlorophenol	9000	48000	--	--	--	--	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			PAVED GATED STORAGE AREA			PAVED OPEN STORAGE AREA		
Sample Number			DA-S-SB-DUP06-01	DA-S-SB06-0515-01	DA-S-SB06-2535-01	DA-S-SB05-0102-01	DA-S-SB05-0203-01	DA-S-SB05-0304-01
Sample Location			SB04	SB06	SB06	SB05	SB05	SB05
Date Sampled			8/18/2003	8/18/2003	8/18/2003	8/19/2003	8/19/2003	8/19/2003
Interval			9.0-10.0	0.5-1.5	2.5-3.5	1.0-2.0	2.0-3.0	3.0-4.0
QC Identifier			Field Dup. DA-S-SB04-0910-01	None	None	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Phenanthrene		10000000	--	280 J	--	--	--	390 J
Pyrene	2900000	10000000	--	450 J	--	--	--	950 J
Pesticide/PCB Analysis (UG/KG)								
4,4'-DDE	7000		--	--	--	--	--	--
4,4'-DDT	7000		--	--	--	--	--	--
alpha-Chlordane			--	--	--	--	--	--
Aroclor-1248	740		--	--	--	--	--	--
Aroclor-1254	740		--	--	--	--	--	--
Aroclor-1260	740		--	--	--	--	--	--
Aroclor-1268	1000		--	117	--	--	--	--
Toxaphene	1600		--	--	--	--	--	--
Total Metal Analysis (MG/KG)								
Aluminum	10000		3700	4100	5400	4300	12000	9200
Antimony	41	820	--	--	--	--	--	--
Arsenic	1.6	3.8	24.0 J	12.0 J	18.0 J	7.7	33.0	17.0
Barium	6700	10000	10.0	13.0	15.0	10.0	12.0	18.0
Beryllium	1900	1.3	--	0.28	0.36	0.35	0.34	0.36
Cadmium	45	1000	--	0.73 J	--	--	--	--
Calcium			510	1100	160	520	1900	2000
Chromium	64	10000	7.3	8.6	7.7	5.6 J	15.0 J	11.0 J
Cobalt	1900		14.0	8.8	11.0	4.7	14.0	9.9
Copper	4100	10000	23.0	18.0	14.0	9.0	26.0	19.0
Iron	10000		23000	17000	20000	10000	29000	22000
Lead	750	500	6.8	9.8	7.1	12.0	13.0	15.0
Magnesium			1300	1400	1100	1400 J	3900 J	2400 J
Manganese	1900	10000	390	390	480	150	370	440
Mercury	31	610	--	0.0161	0.0121	--	0.025	0.0377
Molybdenum			--	--	--	--	--	--
Nickel	2000	10000	22.0	12.0	11.0	7.4	23.0	16.0
Potassium			160	320	120	540	140	200
Selenium	510	10000	--	--	--	--	--	--
Silver	510	10000	--	--	--	--	0.034 J	0.12
Sodium			--	--	--	73.0 J	--	--
Thallium	6.7	140	0.30 J	--	0.23 J	--	--	--
Vanadium	720	10000	9.3	9.7	12.0	8.2	16.0	13.0
Zinc	10000	10000	40.0 J	39.0 J	29.0 J	28.0 J	48.0 J	46.0 J
Total Petroleum Hydrocarbon Analysis (UG/KG)								
Diesel Range Organics		2,500,000	370000	230000	--	83000	--	13000
Gasoline Range Organics			130000 J	--	--	580 J	390 J	1400 J
Miscellaneous Analysis (%)								
TOTAL SOLIDS			83.0	90.0	87.0	93.0	89.0	82.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			PAVED OPEN STORAGE AREA					
Sample Number			DA-S-SB08-0102-01	DA-S-SB08-0607-01	DA-S-MW-DUP07-01	DA-S-TP14-0001-01	DA-S-TP14-0506-01	DA-S-TP14-0910-01
Sample Location			SB08	SB08	SB08	TP14	TP14	TP14
Date Sampled			8/19/2003	8/19/2003	8/19/2003	8/14/2003	8/14/2003	8/14/2003
Interval			1.0-2.0	6.0-7.0	6.0-7.0	0.0-1.0	5.0-6.0	9.0-10.0
QC Identifier			None	Field Dup. DA-S-SB08-0607-01	Field Dup. DA-S-SB08-0607-01	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Volatile Organic Analysis (UG/KG)								
1,2,4-Trimethylbenzene	17000		--	--	--	--	3 J	--
1,3,5-Trimethylbenzene	7000		--	--	--	--	--	--
2-Butanone	2700000	10000000	--	5.8 J	3.4 J	--	--	--
Acetone	600000	10000000	38 J	72 J	28 J	--	--	--
Carbon Disulfide	72000		--	1.2 J	--	--	--	--
Chloroform	1200	940000	--	--	--	--	--	--
cis-1,2-Dichloroethene	15000		--	--	--	--	--	--
Ethylbenzene	20000	10000000	--	--	--	--	--	--
Isopropylbenzene	200000		--	--	--	--	--	--
m&p-Xylene			--	1.8 J	--	--	--	--
Methylene Chloride	21000	760000	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
n-Butylbenzene	24000		--	--	--	--	--	--
n-Propylbenzene	24000		--	--	--	--	--	--
o-Xylene			--	0.79	--	--	--	--
p-Isopropyltoluene			--	--	--	--	--	--
sec-Butylbenzene	22000		--	--	--	--	--	--
tert-Butylbenzene	39000		--	--	--	--	--	--
Tetrachloroethene	3400	110000	--	--	--	--	--	--
Toluene	52000	10000000	--	--	--	--	--	--
Trichloroethene	110	520000	--	--	--	--	--	--
Semivolatile Organic Analysis (UG/KG)								
2,4-Dimethylphenol	1200000	10000000	--	--	--	--	--	--
2,4-Dinitrophenol	120000	4100000	--	--	--	--	--	310 J
2-Methylnaphthalene		10000000	--	--	--	--	--	--
3,3'-Dichlorobenzidine	3800	13000	--	--	--	--	--	220 J
4,6-Dinitro-2-methylphenol			--	--	--	--	--	260 J
4-Nitroaniline			--	--	--	--	--	420 J
4-Nitrophenol	700000		--	--	--	--	--	520 J
Acenaphthene	2900000	10000000	--	--	--	--	--	--
Acenaphthylene		10000000	--	--	--	--	--	--
Anthracene	10000000	10000000	44 J	--	--	--	--	130 J
Benzo(a)anthracene	2100	7800	280 J	--	--	--	280 J	420 J
Benzo(a)pyrene	210	800	190 J	--	--	--	--	--
Benzo(b)fluoranthene	2100	7800	180 J	--	--	--	220 J	440 J
Benzo(g,h,i)perylene		10000000	--	--	--	--	--	290 J
Benzo(k)fluoranthene	21000	78000	200 J	--	--	--	230 J	400 J
Benzoic acid	10000000		--	--	--	--	--	2300 J
bis(2-Ethylhexyl)phthalate	120000	410000	410 J	--	--	430 J	1000 J	940 J
Carbazole	86000		--	--	--	--	--	--
Chrysene	210000	780000	310 J	--	--	--	320 J	460 J
Dibenzo(a,h)anthracene	210	800	--	--	--	--	--	--
Dibenzofuran	310000		--	--	--	--	--	--
Diethylphthalate	10000000	10000000	--	--	--	--	--	--
Di-n-Butylphthalate	6200000		--	--	--	--	--	--
Fluoranthene	2200000	10000000	520 J	--	--	--	690 J	820 J
Fluorene	2600000	10000000	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	2100	7800	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
Pentachlorophenol	9000	48000	--	--	--	--	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			PAVED OPEN STORAGE AREA					
Sample Number			DA-S-SB08-0102-01	DA-S-SB08-0607-01	DA-S-MW-DUP07-01	DA-S-TP14-0001-01	DA-S-TP14-0506-01	DA-S-TP14-0910-01
Sample Location			SB08	SB08	SB08	TP14	TP14	TP14
Date Sampled			8/19/2003	8/19/2003	8/19/2003	8/14/2003	8/14/2003	8/14/2003
Interval			1.0-2.0	6.0-7.0	6.0-7.0	0.0-1.0	5.0-6.0	9.0-10.0
QC Identifier			None	Field Dup. DA-S-SB08-0607-01	Field Dup. DA-S-SB08-0607-01	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Phenanthrene		10000000	280 J	--	--	--	440 J	--
Pyrene	2900000	10000000	450 J	--	--	--	590 J	740 J
Pesticide/PCB Analysis (UG/KG)								
4,4'-DDE	7000		--	--	--	--	--	--
4,4'-DDT	7000		--	--	--	--	--	--
alpha-Chlordane			--	--	--	--	--	--
Aroclor-1248	740		--	--	--	--	--	--
Aroclor-1254	740		--	--	--	--	55.2 J	--
Aroclor-1260	740		--	--	--	--	--	--
Aroclor-1268	1000		--	--	--	--	--	--
Toxaphene	1600		--	--	--	--	--	--
Total Metal Analysis (MG/KG)								
Aluminum	10000		7800	11000	11000	4600	9300	14000
Antimony	41	820	--	--	--	--	--	--
Arsenic	1.6	3.8	10.0	14.0	13.0	3.6 J	24.0 J	12.0 J
Barium	6700	10000	14.0	18.0	17.0	14.0	30.0	21.0
Beryllium	1900	1.3	0.36	0.38	0.37	--	0.36 J	0.41 J
Cadmium	45	1000	--	--	--	0.33 J	5.4	3.5 J
Calcium			330	200	180	450 J	1200 J	750 J
Chromium	64	10000	19.0 J	22.0 J	22.0 J	4.7 J	20.0 J	14.0 J
Cobalt	1900		8.6	13.0	13.0	3.6	30.0	13.0
Copper	4100	10000	17.0	23.0	21.0	8.6	55.0	20.0
Iron	10000		18000	32000	32000	9800	38000	29000
Lead	750	500	15.0	9.7	9.4	24.0	830	46.0
Magnesium			2400 J	3500 J	3500 J	1700 J	3200 J	3000 J
Manganese	1900	10000	200	300	290	170	340	220
Mercury	31	610	0.0107 J	--	--	0.0090 J	0.090	0.036
Molybdenum			--	--	--	--	--	--
Nickel	2000	10000	14.0	21.0	21.0	5.2	25.0	19.0
Potassium			230	170	160	820	190	170
Selenium	510	10000	--	--	--	--	--	--
Silver	510	10000	0.034 J	--	--	--	2.5	--
Sodium			--	--	--	--	--	--
Thallium	6.7	140	--	--	--	--	--	--
Vanadium	720	10000	12.0	16.0	17.0	11.0	20.0	19.0
Zinc	10000	10000	33.0 J	46.0 J	46.0 J	26.0 J	120 J	57.0 J
Total Petroleum Hydrocarbon Analysis (UG/KG)								
Diesel Range Organics		2,500,000	32000 J	--	--	--	330000	380000
Gasoline Range Organics			5500 J	470 J	570 J	1100 J	3800 J	1400 J
Miscellaneous Analysis (%)								
TOTAL SOLIDS			NA	NA	87.0	86.0	84.0	80.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			PAVED OPEN		SOUTH MEADOW			
Sample Number			DA-S-MW04B-0810-01	DA-S-MW04B-1416-01	DA-S-TP01-0001-01	DA-S-TP01-0304-01	DA-S-TP01-0607-01	DA-S-TP02-0001-01
Sample Location			MW04B	MW04B	TP01	TP01	TP01	TP02
Date Sampled			8/28/2003	8/28/2003	8/11/2003	8/11/2003	8/11/2003	8/13/2003
Interval			8.0-10.0	14.0-16.0	0.0-1.0	3.0-4.0	6.0-7.0	0.0-1.0
QC Identifier			None	None	None	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Volatile Organic Analysis (UG/KG)								
1,2,4-Trimethylbenzene	17000		--	--	1600	--	--	--
1,3,5-Trimethylbenzene	7000		--	--	860 J	--	--	--
2-Butanone	2700000	10000000	--	--	--	--	--	--
Acetone	600000	10000000	--	--	--	--	--	--
Carbon Disulfide	72000		--	--	--	--	--	--
Chloroform	1200	940000	--	--	--	--	--	--
cis-1,2-Dichloroethene	15000		--	1.3	--	--	--	--
Ethylbenzene	20000	10000000	--	--	--	--	--	--
Isopropylbenzene	200000		--	--	--	--	--	--
m&p-Xylene			--	--	350	0.96 J	--	--
Methylene Chloride	21000	760000	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	780 J	--	--	--
n-Butylbenzene	24000		--	--	260	--	--	--
n-Propylbenzene	24000		--	--	300	--	--	--
o-Xylene			--	--	230	--	--	--
p-Isopropyltoluene			--	--	260	--	--	--
sec-Butylbenzene	22000		--	--	--	--	--	--
tert-Butylbenzene	39000		--	--	--	--	--	--
Tetrachloroethene	3400	110000	--	3.7	--	--	--	--
Toluene	52000	10000000	--	--	--	--	--	--
Trichloroethene	110	520000	--	3.3	--	--	--	--
Semivolatile Organic Analysis (UG/KG)								
2,4-Dimethylphenol	1200000	10000000	--	--	--	--	--	--
2,4-Dinitrophenol	120000	4100000	--	--	--	--	--	--
2-Methylnaphthalene		10000000	--	--	--	--	--	--
3,3'-Dichlorobenzidine	3800	13000	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol			--	--	--	--	--	--
4-Nitroaniline			--	--	--	--	--	--
4-Nitrophenol	700000		--	--	--	--	--	--
Acenaphthene	2900000	10000000	440 J	94 J	130 J	73 J	120 J	250 J
Acenaphthylene		10000000	--	--	--	--	94 J	--
Anthracene	10000000	10000000	970 J	260 J	370 J	170 J	340 J	500 J
Benzo(a)anthracene	2100	7800	2300	610	900	760	1300	1800
Benzo(a)pyrene	210	800	1900	400 J	730	730	1200	1300
Benzo(b)fluoranthene	2100	7800	1700	410 J	630 J	660	1100	1400
Benzo(g,h,i)perylene		10000000	1300	290 J	500 J	530 J	850	910
Benzo(k)fluoranthene	21000	78000	1600	450 J	680 J	700	1100	1200
Benzoic acid	10000000		--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	120000	410000	--	--	560 J	460 J	--	420 J
Carbazole	86000		760 J	140 J	220 J	160 J	260 J	430 J
Chrysene	210000	780000	2200	600	910	910	1500	1800
Dibenzo(a,h)anthracene	210	800	380 J	--	--	--	230 J	290 J
Dibenzofuran	310000		340 J	--	--	--	--	--
Diethylphthalate	10000000	10000000	--	--	--	--	--	--
Di-n-Butylphthalate	6200000		--	120 J	--	--	--	--
Fluoranthene	2200000	10000000	5000	1500	2200	1900	3300	4200
Fluorene	2600000	10000000	520 J	140 J	160 J	80 J	170 J	270 J
Indeno(1,2,3-cd)pyrene	2100	7800	1200 J	260 J	450 J	460 J	800 J	850
Naphthalene	19000	10000000	180 J	--	--	--	--	--
Pentachlorophenol	9000	48000	--	--	--	--	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			PAVED OPEN		SOUTH MEADOW			
Sample Number			DA-S-MW04B-0810-01	DA-S-MW04B-1416-01	DA-S-TP01-0001-01	DA-S-TP01-0304-01	DA-S-TP01-0607-01	DA-S-TP02-0001-01
Sample Location			MW04B	MW04B	TP01	TP01	TP01	TP02
Date Sampled			8/28/2003	8/28/2003	8/11/2003	8/11/2003	8/11/2003	8/13/2003
Interval			8.0-10.0	14.0-16.0	0.0-1.0	3.0-4.0	6.0-7.0	0.0-1.0
QC Identifier			None	None	None	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Phenanthrene		10000000	4400	1200	1600	1100	2200	2800
Pyrene	2900000	10000000	4200	1200	1800	1600	2800	3400
Pesticide/PCB Analysis (UG/KG)								
4,4'-DDE	7000		--	--	--	--	--	--
4,4'-DDT	7000		--	--	184 J	225 J	200	--
alpha-Chlordane			--	--	--	--	--	--
Aroclor-1248	740		--	--	--	--	--	--
Aroclor-1254	740		--	--	152 J	--	--	--
Aroclor-1260	740		--	--	--	--	--	--
Aroclor-1268	1000		--	--	134	96.7	27.4 J	--
Toxaphene	1600		--	--	--	--	--	--
Total Metal Analysis (MG/KG)								
Aluminum	10000		6500	6200	9100	7300	7300	6400 J
Antimony	41	820	0.37	0.26	1.3	--	--	1.2 J
Arsenic	1.6	3.8	16.0 J	21.0 J	19.0 J	19.0 J	15.0 J	16.0 J
Barium	6700	10000	21.0	9.4	39.0	20.0	20.0	44.0
Beryllium	1900	1.3	0.27	0.24	0.33	0.27	0.30	--
Cadmium	45	1000	0.19	--	11.0	2.8 J	1.3 J	0.34 J
Calcium			7500 J	2700 J	1400 J	1400 J	1700 J	2700 J
Chromium	64	10000	9.7 J	11.0 J	26.0	11.0 J	9.8	9.0 J
Cobalt	1900		9.1 J	17.0 J	17.0 J	12.0 J	13.0 J	16.0
Copper	4100	10000	17.0 J	22.0 J	51.0	26.0	20.0	20.0
Iron	10000		15000	18000	21000	23000	16000	18000 J
Lead	750	500	17.0 J	24.0 J	120	36.0	37.0	50.0
Magnesium			1500	2000	2500	2300	2000	2100 J
Manganese	1900	10000	270	300	300	340	280	270
Mercury	31	610	0.0508	--	0.14 J	0.087 J	0.055 J	0.030
Molybdenum			0.53	0.59	0.84	--	--	--
Nickel	2000	10000	11.0 J	14.0 J	24.0	19.0	14.0	13.0
Potassium			180	140	300	260	190	160
Selenium	510	10000	--	--	--	--	--	--
Silver	510	10000	--	0.20	2.0	1.1	--	0.37
Sodium			47.0	--	--	--	--	--
Thallium	6.7	140	--	--	--	--	--	--
Vanadium	720	10000	12.0	11.0	18.0	15.0	17.0	15.0
Zinc	10000	10000	34.0 J	34.0 J	120	88.0	59.0	64.0 J
Total Petroleum Hydrocarbon Analysis (UG/KG)								
Diesel Range Organics		2,500,000	NA	NA	63000 J	190000	110000	59000
Gasoline Range Organics			--	--	27000	1800 J	810 J	470 J
Miscellaneous Analysis (%)								
TOTAL SOLIDS			85.0	88.0	72.0	85.0	86.0	89.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			SOUTH MEADOW					
Sample Number			DA-S-TP02-0102-01	DA-S-TP02-0203-01	DA-S-TP-DUP02-01	DA-S-TP02-0506-01	DA-S-TP05-0001-01	DA-S-TP05-0607-01
Sample Location			TP02	TP02	TP02	TP02	TP05	TP05
Date Sampled			8/13/2003	8/13/2003	8/13/2003	8/13/2003	8/11/2003	8/11/2003
Interval			1.0-2.0	2.0-3.0	2.0-3.0	5.0-6.0	0.0-1.0	6.0-7.0
QC Identifier			None	Field Dup. DA-S-TP02-0203-01	Field Dup. DA-S-TP02-0203-01	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Volatile Organic Analysis (UG/KG)								
1,2,4-Trimethylbenzene	17000		--	--	240 J	--	--	--
1,3,5-Trimethylbenzene	7000		--	--	--	--	--	--
2-Butanone	2700000	10000000	--	--	--	--	--	--
Acetone	600000	10000000	--	--	--	--	--	--
Carbon Disulfide	72000		--	--	--	--	--	--
Chloroform	1200	940000	--	--	--	--	--	--
cis-1,2-Dichloroethene	15000		--	--	--	--	--	--
Ethylbenzene	20000	10000000	--	--	--	--	--	--
Isopropylbenzene	200000		--	--	--	--	--	--
m&p-Xylene			--	--	130 J	--	0.79 J	--
Methylene Chloride	21000	760000	--	1300 J	--	--	--	--
Naphthalene	19000	10000000	1400000	94000 J	16000 J	--	--	--
n-Butylbenzene	24000		--	--	--	--	--	--
n-Propylbenzene	24000		--	--	--	--	--	--
o-Xylene			--	--	--	--	--	--
p-Isopropyltoluene			--	--	160	--	--	--
sec-Butylbenzene	22000		--	--	--	--	--	--
tert-Butylbenzene	39000		--	--	--	--	--	--
Tetrachloroethene	3400	110000	--	--	--	--	--	--
Toluene	52000	10000000	--	--	90 J	--	--	--
Trichloroethene	110	520000	--	--	--	--	--	--
Semivolatile Organic Analysis (UG/KG)								
2,4-Dimethylphenol	1200000	10000000	--	--	--	510 J	--	--
2,4-Dinitrophenol	120000	4100000	--	--	--	--	--	--
2-Methylnaphthalene		10000000	390000 J	--	--	--	--	--
3,3'-Dichlorobenzidine	3800	13000	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol			--	--	--	--	--	--
4-Nitroaniline			--	--	--	--	--	--
4-Nitrophenol	700000		--	--	--	--	--	--
Acenaphthene	2900000	10000000	1400000	7600 J	9400 J	160 J	--	--
Acenaphthylene		10000000	--	--	--	--	--	--
Anthracene	10000000	10000000	1300000	8800 J	12000 J	260 J	160 J	--
Benzo(a)anthracene	2100	7800	1700000	15000	20000	750 J	590	--
Benzo(a)pyrene	210	800	1400000	12000	15000	510 J	460 J	--
Benzo(b)fluoranthene	2100	7800	1200000	10000 J	13000 J	510 J	460 J	--
Benzo(g,h,i)perylene		10000000	800000	7600 J	9000 J	370 J	330 J	--
Benzo(k)fluoranthene	21000	78000	1100000	9900 J	13000 J	560 J	470 J	--
Benzoic acid	10000000		--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	120000	410000	--	--	--	400 J	530 J	410 J
Carbazole	86000		770000	5300 J	7400 J	250 J	--	--
Chrysene	210000	780000	1500000	14000	18000	720 J	610	--
Dibenzo(a,h)anthracene	210	800	210000 J	--	--	--	--	--
Dibenzofuran	310000		620000	--	3700 J	--	--	--
Diethylphthalate	10000000	10000000	150000 J	--	--	180 J	--	--
Di-n-Butylphthalate	6200000		--	--	--	--	--	--
Fluoranthene	2200000	10000000	4500000	37000	50000	1800 J	1300	--
Fluorene	2600000	10000000	920000	5400 J	7500 J	120 J	70 J	--
Indeno(1,2,3-cd)pyrene	2100	7800	820000	7400 J	9200 J	360 J	290 J	--
Naphthalene	19000	10000000	1900000	4600 J	4600 J	180 J	--	--
Pentachlorophenol	9000	48000	--	--	--	--	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			SOUTH MEADOW					
Sample Number			DA-S-TP02-0102-01	DA-S-TP02-0203-01	DA-S-TP-DUP02-01	DA-S-TP02-0506-01	DA-S-TP05-0001-01	DA-S-TP05-0607-01
Sample Location			TP02	TP02	TP02	TP02	TP05	TP05
Date Sampled			8/13/2003	8/13/2003	8/13/2003	8/13/2003	8/11/2003	8/11/2003
Interval			1.0-2.0	2.0-3.0	2.0-3.0	5.0-6.0	0.0-1.0	6.0-7.0
QC Identifier			None	Field Dup. DA-S-TP02-0203-01	Field Dup. DA-S-TP02-0203-01	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Phenanthrene		10000000	4700000	34000	46000	1200 J	790	--
Pyrene	2900000	10000000	3600000	29000	39000	1400 J	1100	--
Pesticide/PCB Analysis (UG/KG)								
4,4'-DDE	7000		--	--	--	--	--	--
4,4'-DDT	7000		--	--	--	--	--	--
alpha-Chlordane			--	--	--	--	--	--
Aroclor-1248	740		--	--	--	--	--	--
Aroclor-1254	740		--	--	--	--	--	--
Aroclor-1260	740		--	--	--	--	94.8	--
Aroclor-1268	1000		--	--	--	--	--	--
Toxaphene	1600		--	--	--	--	--	--
Total Metal Analysis (MG/KG)								
Aluminum	10000		37.0 J	8200 J	9400 J	9000 J	7000	6700
Antimony	41	820	--	--	--	--	--	--
Arsenic	1.6	3.8	0.19 J	27.0 J	27.0 J	22.0 J	13.0 J	26.0 J
Barium	6700	10000	--	15.0	16.0	18.0	17.0	22.0
Beryllium	1900	1.3	--	0.31 J	0.33 J	0.31 J	0.34	0.32
Cadmium	45	1000	--	0.28 J	--	--	0.92 J	0.17 J
Calcium			--	1300 J	2200 J	590 J	800 J	220 J
Chromium	64	10000	0.24 J	11.0 J	12.0 J	12.0 J	9.3 J	8.6 J
Cobalt	1900		0.36	15.0	18.0	17.0	9.2 J	19.0 J
Copper	4100	10000	0.64	22.0	26.0	26.0	24.0	31.0
Iron	10000		920 J	29000 J	35000 J	33000 J	24000	28000
Lead	750	500	1.8	16.0	17.0	12.0	22.0	9.6
Magnesium			21.0 J	2500 J	2900 J	3100 J	2200	2200
Manganese	1900	10000	4.6	420	420	670	380	2700
Mercury	31	610	--	0.022	0.022	--	0.084 J	0.0089 J
Molybdenum			--	--	--	--	0.44	--
Nickel	2000	10000	0.39	20.0	22.0	26.0	15.0	27.0
Potassium			--	130	160	170	240	150
Selenium	510	10000	--	--	--	--	--	--
Silver	510	10000	--	--	--	--	--	--
Sodium			--	--	--	--	--	--
Thallium	6.7	140	--	--	--	--	--	0.89 J
Vanadium	720	10000	--	14.0	16.0	15.0	14.0	12.0
Zinc	10000	10000	2.2 J	54.0 J	57.0 J	58.0 J	71.0	50.0
Total Petroleum Hydrocarbon Analysis (UG/KG)								
Diesel Range Organics		2,500,000	390,000,000	3,100,000 J	990000 J	46000 J	52000 J	--
Gasoline Range Organics			100000	71000 J	16000 J	3400 J	560 J	1100 J
Miscellaneous Analysis (%)								
TOTAL SOLIDS			NA	88.0	88.0	89.0	88.0	89.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			SOUTH MEADOW					
Sample Number			DA-S-TP05-0910-01	DA-S-TP-DUP01-01	DA-S-TP06-0001-01	DA-S-TP06-0304-01	DA-S-TP06-0910-01	DA-S-TP07-0001-01
Sample Location			TP05	TP05	TP06	TP06	TP06	TP07
Date Sampled			8/11/2003	8/11/2003	8/13/2003	8/13/2003	8/13/2003	8/12/2003
Interval			9.0-10.0	9.0-10.0	0.0-1.0	3.0-4.0	9.0-10.0	0.0-1.0
QC Identifier			Field Dup. DA-S-TP05-0910-01	Field Dup. DA-S-TP05-0910-01	None	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Volatile Organic Analysis (UG/KG)								
1,2,4-Trimethylbenzene	17000		--	--	--	--	--	--
1,3,5-Trimethylbenzene	7000		--	--	--	--	--	--
2-Butanone	2700000	10000000	--	--	--	--	--	--
Acetone	600000	10000000	--	--	--	--	--	--
Carbon Disulfide	72000		--	--	--	--	--	--
Chloroform	1200	940000	--	--	--	--	--	--
cis-1,2-Dichloroethene	15000		--	--	--	--	--	--
Ethylbenzene	20000	10000000	--	--	--	--	--	--
Isopropylbenzene	200000		--	--	--	--	--	--
m&p-Xylene			--	--	--	--	--	--
Methylene Chloride	21000	760000	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
n-Butylbenzene	24000		--	--	--	--	--	--
n-Propylbenzene	24000		--	--	--	--	--	--
o-Xylene			--	--	--	--	--	--
p-Isopropyltoluene			--	--	--	--	--	--
sec-Butylbenzene	22000		--	--	--	--	--	--
tert-Butylbenzene	39000		--	--	--	--	--	--
Tetrachloroethene	3400	110000	--	--	--	0.64 J	--	--
Toluene	52000	10000000	--	--	--	--	--	--
Trichloroethene	110	520000	--	--	--	--	--	--
Semivolatile Organic Analysis (UG/KG)								
2,4-Dimethylphenol	1200000	10000000	--	--	--	--	--	--
2,4-Dinitrophenol	120000	4100000	--	--	--	--	--	--
2-Methylnaphthalene		10000000	--	--	--	--	--	--
3,3'-Dichlorobenzidine	3800	13000	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol			--	--	--	--	--	--
4-Nitroaniline			--	--	--	--	--	--
4-Nitrophenol	700000		--	--	--	--	--	--
Acenaphthene	2900000	10000000	--	--	--	--	--	110 J
Acenaphthylene		10000000	--	--	--	--	--	--
Anthracene	10000000	10000000	--	--	52 J	94 J	--	270 J
Benzo(a)anthracene	2100	7800	--	--	170 J	290 J	--	580
Benzo(a)pyrene	210	800	--	--	120 J	190 J	--	460 J
Benzo(b)fluoranthene	2100	7800	--	--	140 J	220 J	--	420 J
Benzo(g,h,i)perylene		10000000	--	--	--	130 J	--	370 J
Benzo(k)fluoranthene	21000	78000	--	--	130 J	210 J	--	430 J
Benzoic acid	10000000		--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	120000	410000	470 J	470 J	460 J	440 J	420 J	--
Carbazole	86000		--	--	--	--	--	160 J
Chrysene	210000	780000	--	--	180 J	290 J	--	570 J
Dibenzo(a,h)anthracene	210	800	--	--	--	--	--	--
Dibenzofuran	310000		--	--	--	--	--	--
Diethylphthalate	10000000	10000000	--	--	--	--	--	--
Di-n-Butylphthalate	6200000		--	--	--	--	--	--
Fluoranthene	2200000	10000000	--	--	370 J	660 J	--	1200
Fluorene	2600000	10000000	--	--	--	--	--	100 J
Indeno(1,2,3-cd)pyrene	2100	7800	--	--	--	--	--	320 J
Naphthalene	19000	10000000	--	--	--	--	--	--
Pentachlorophenol	9000	48000	--	--	--	410 J	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			SOUTH MEADOW					
Sample Number			DA-S-TP05-0910-01	DA-S-TP-DUP01-01	DA-S-TP06-0001-01	DA-S-TP06-0304-01	DA-S-TP06-0910-01	DA-S-TP07-0001-01
Sample Location			TP05	TP05	TP06	TP06	TP06	TP07
Date Sampled			8/11/2003	8/11/2003	8/13/2003	8/13/2003	8/13/2003	8/12/2003
Interval			9.0-10.0	9.0-10.0	0.0-1.0	3.0-4.0	9.0-10.0	0.0-1.0
QC Identifier			Field Dup. DA-S-TP05-0910-01	Field Dup. DA-S-TP05-0910-01	None	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Phenanthrene		10000000	--	--	230 J	510 J	--	1000
Pyrene	2900000	10000000	--	--	310 J	530 J	--	1000
Pesticide/PCB Analysis (UG/KG)								
4,4'-DDE	7000		--	--	--	--	--	216
4,4'-DDT	7000		--	--	--	--	--	--
alpha-Chlordane			--	--	--	--	--	235
Aroclor-1248	740		--	--	--	--	--	--
Aroclor-1254	740		--	--	--	--	--	5220 J
Aroclor-1260	740		--	--	--	--	--	--
Aroclor-1268	1000		--	--	--	--	--	--
Toxaphene	1600		--	--	--	--	--	--
Total Metal Analysis (MG/KG)								
Aluminum	10000		12000	11000	9500	7600	7900	5400
Antimony	41	820	--	--	--	--	--	--
Arsenic	1.6	3.8	14.0 J	14.0 J	18.0 J	16.0 J	20.0 J	19.0 J
Barium	6700	10000	12.0	11.0	17.0	17.0	12.0	26.0
Beryllium	1900	1.3	0.25	0.25	0.23 J	0.31 J	0.28 J	0.26
Cadmium	45	1000	0.21 J	0.16 J	--	--	--	0.20 J
Calcium			950 J	870 J	1400 J	960 J	630 J	1200 J
Chromium	64	10000	14.0 J	13.0 J	13.0 J	9.1 J	10.0 J	7.1 J
Cobalt	1900		18.0 J	16.0 J	8.3	6.4	15.0	9.0 J
Copper	4100	10000	28.0	25.0	19.0	12.0	28.0	17.0
Iron	10000		30000	29000	24000 J	16000	29000 J	14000
Lead	750	500	18.0	19.0	26.0	16.0	14.0	23.0
Magnesium			4200	3800	3200 J	1400 J	2700 J	1400
Manganese	1900	10000	660	590	240	180	920	240
Mercury	31	610	0.021 J	0.019 J	0.072	0.041	--	0.14 J
Molybdenum			--	--	--	--	--	--
Nickel	2000	10000	26.0	23.0	17.0	9.8	25.0	12.0
Potassium			120	130	180	170	240	170
Selenium	510	10000	--	--	--	--	--	--
Silver	510	10000	--	--	--	--	0.50	--
Sodium			--	--	--	--	--	--
Thallium	6.7	140	--	--	--	--	--	--
Vanadium	720	10000	16.0	16.0	18.0	14.0	13.0	13.0
Zinc	10000	10000	57.0	54.0	65.0 J	34.0 J	68.0 J	40.0
Total Petroleum Hydrocarbon Analysis (UG/KG)								
Diesel Range Organics		2,500,000	--	--	20000 J	--	--	430000
Gasoline Range Organics			1200 J	710 J	1600 J	1400 J	790 J	750 J
Miscellaneous Analysis (%)								
TOTAL SOLIDS			78.0	78.0	84.0	84.0	88.0	86.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			SOUTH MEADOW					
Sample Number			DA-S-TP07-0304-01	DA-S-TP07-0910-01	DA-S-TP08-0001-01	DA-S-TP08-0304-01	DA-S-TP-DUP05-01	DA-S-TP08-0708-01
Sample Location			TP07	TP07	TP08	TP08	TP08	TP08
Date Sampled			8/12/2003	8/12/2003	8/15/2003	8/15/2003	8/15/2003	8/15/2003
Interval			3.0-4.0	9.0-10.0	0.0-1.0	3.0-4.0	3.0-4.0	7.0-8.0
QC Identifier			None	None	None	Field Dup. DA-S-TP08-0304-01	Field Dup. DA-S-TP08-0304-01	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Volatile Organic Analysis (UG/KG)								
1,2,4-Trimethylbenzene	17000		--	--	--	--	--	--
1,3,5-Trimethylbenzene	7000		--	--	--	--	--	--
2-Butanone	2700000	10000000	--	--	--	--	--	--
Acetone	600000	10000000	--	--	--	--	--	--
Carbon Disulfide	72000		--	--	--	--	--	--
Chloroform	1200	940000	--	--	--	--	--	--
cis-1,2-Dichloroethene	15000		--	--	--	--	--	--
Ethylbenzene	20000	10000000	--	--	--	--	--	--
Isopropylbenzene	200000		--	--	--	--	--	--
m&p-Xylene			--	--	--	--	--	--
Methylene Chloride	21000	760000	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
n-Butylbenzene	24000		--	--	--	--	--	--
n-Propylbenzene	24000		--	--	--	--	--	--
o-Xylene			--	--	--	--	--	--
p-Isopropyltoluene			--	--	--	--	--	--
sec-Butylbenzene	22000		--	--	--	--	--	--
tert-Butylbenzene	39000		--	--	--	--	--	--
Tetrachloroethene	3400	110000	--	5.4	--	2.1 J	--	4.2
Toluene	52000	10000000	--	--	--	--	--	--
Trichloroethene	110	520000	--	7.8	--	--	--	--
Semivolatile Organic Analysis (UG/KG)								
2,4-Dimethylphenol	1200000	10000000	--	--	--	--	--	--
2,4-Dinitrophenol	120000	4100000	--	--	--	--	--	--
2-Methylnaphthalene		10000000	--	--	--	--	--	8600 J
3,3'-Dichlorobenzidine	3800	13000	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol			--	--	--	--	--	--
4-Nitroaniline			--	--	--	--	--	--
4-Nitrophenol	700000		--	--	--	--	--	--
Acenaphthene	2900000	10000000	--	--	120 J	760 J	370 J	27000
Acenaphthylene		10000000	--	--	--	--	--	3500 J
Anthracene	10000000	10000000	110 J	88 J	520 J	2600 J	1100 J	55000
Benzo(a)anthracene	2100	7800	460 J	310 J	1600	5700 J	2500 J	78000
Benzo(a)pyrene	210	800	490 J	270 J	840	2900	1900	56000
Benzo(b)fluoranthene	2100	7800	510 J	280 J	820	3100 J	1800 J	51000
Benzo(g,h,i)perylene		10000000	400 J	220 J	420 J	1400	1100	33000
Benzo(k)fluoranthene	21000	78000	440 J	260 J	880	2900 J	1700 J	47000
Benzoic acid	10000000		--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	120000	410000	450 J	--	--	--	--	--
Carbazole	86000		92 J	--	470 J	2000 J	670 J	34000
Chrysene	210000	780000	570 J	330 J	1500	5600 J	2500 J	71000
Dibenzo(a,h)anthracene	210	800	--	--	--	520 J	370 J	10000 J
Dibenzofuran	310000		--	--	--	450 J	240 J	23000
Diethylphthalate	10000000	10000000	--	--	--	--	--	--
Di-n-Butylphthalate	6200000		--	--	--	--	--	--
Fluoranthene	2200000	10000000	1100 J	650	4100	16000 J	6100 J	200000
Fluorene	2600000	10000000	--	--	180 J	1000 J	520 J	45000
Indeno(1,2,3-cd)pyrene	2100	7800	350 J	200 J	420 J	1400	1100	30000
Naphthalene	19000	10000000	--	--	--	170 J	150 J	20000
Pentachlorophenol	9000	48000	--	--	--	--	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			SOUTH MEADOW					
Sample Number			DA-S-TP07-0304-01	DA-S-TP07-0910-01	DA-S-TP08-0001-01	DA-S-TP08-0304-01	DA-S-TP-DUP05-01	DA-S-TP08-0708-01
Sample Location			TP07	TP07	TP08	TP08	TP08	TP08
Date Sampled			8/12/2003	8/12/2003	8/15/2003	8/15/2003	8/15/2003	8/15/2003
Interval			3.0-4.0	9.0-10.0	0.0-1.0	3.0-4.0	3.0-4.0	7.0-8.0
QC Identifier			None	None	None	Field Dup. DA-S-TP08-0304-01	Field Dup. DA-S-TP08-0304-01	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Phenanthrene		10000000	570 J	410 J	2400	12000 J	4500 J	220000
Pyrene	2900000	10000000	980 J	550 J	3300	13000 J	4800 J	150000
Pesticide/PCB Analysis (UG/KG)								
4,4'-DDE	7000		--	--	--	--	--	--
4,4'-DDT	7000		347 J	171 J	--	--	--	--
alpha-Chlordane			--	--	--	--	--	--
Aroclor-1248	740		--	2190 J	--	117	147 J	--
Aroclor-1254	740		--	--	--	--	--	--
Aroclor-1260	740		--	502	--	--	--	--
Aroclor-1268	1000		54.4 J	--	--	--	--	--
Toxaphene	1600		--	--	--	--	--	--
Total Metal Analysis (MG/KG)								
Aluminum	10000		6100	5700	9400	8700	8100	8900
Antimony	41	820	--	6.2	--	--	--	--
Arsenic	1.6	3.8	16.0 J	14.0 J	25.0	24.0	23.0	24.0
Barium	6700	10000	16.0	19.0	12.0	14.0	13.0	15.0
Beryllium	1900	1.3	0.28	0.23	0.30	0.31	0.28	0.32
Cadmium	45	1000	0.79 J	1.6 J	--	--	--	--
Calcium			720 J	2500 J	590	620	590	680
Chromium	64	10000	7.4	10.0	11.0 J	10.0 J	9.5 J	10.0 J
Cobalt	1900		8.1 J	12.0 J	14.0	12.0	12.0	13.0
Copper	4100	10000	19.0	2600	20.0	20.0	19.0	20.0
Iron	10000		14000	17000	26000	23000	22000	24000
Lead	750	500	24.0	400	9.7	12.0	11.0	36.0
Magnesium			1200	1400	2900	2400	2300	2400
Manganese	1900	10000	240	260	410	330	330	330
Mercury	31	610	0.045 J	0.13 J	--	0.0192	0.0116 J	0.0113 J
Molybdenum			0.42	1.0	--	--	--	--
Nickel	2000	10000	11.0	14.0	21.0	18.0	17.0	18.0
Potassium			130	88.0	180	160	150	160
Selenium	510	10000	--	--	--	--	--	--
Silver	510	10000	--	2.5	--	--	--	--
Sodium			--	--	--	--	--	--
Thallium	6.7	140	--	--	--	--	--	--
Vanadium	720	10000	13.0	10.0	14.0	14.0	13.0	16.0
Zinc	10000	10000	33.0	1200	46.0	42.0	41.0	42.0
Total Petroleum Hydrocarbon Analysis (UG/KG)								
Diesel Range Organics		2,500,000	140000	120000	--	69000	70000	17000
Gasoline Range Organics			4900 J	9000	--	--	--	--
Miscellaneous Analysis (%)								
TOTAL SOLIDS			86.0	82.0	85.0	85.0	85.0	85.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			SOUTH MEADOW					
Sample Number			DA-S-TP15-0001-01	DA-S-TP15-0203-01	DA-S-TP15-0506-01	DA-S-TP15A-0203-01	DA-S-TP15A-0506-01	DA-S-TP15A-0910-01
Sample Location			TP15	TP15	TP15	TP15A	TP15A	TP15A
Date Sampled			8/12/2003	8/12/2003	8/12/2003	8/12/2003	8/12/2003	8/12/2003
Interval			0.0-1.0	2.0-3.0	5.0-6.0	2.0-3.0	5.0-6.0	9.0-10.0
QC Identifier			None	None	None	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Volatile Organic Analysis (UG/KG)								
1,2,4-Trimethylbenzene	17000		--	--	--	--	--	--
1,3,5-Trimethylbenzene	7000		--	--	--	--	--	--
2-Butanone	2700000	10000000	--	--	--	--	--	--
Acetone	600000	10000000	--	--	--	--	--	--
Carbon Disulfide	72000		--	--	--	--	--	--
Chloroform	1200	940000	--	--	--	--	--	--
cis-1,2-Dichloroethene	15000		--	--	--	--	--	--
Ethylbenzene	20000	10000000	--	--	--	--	--	--
Isopropylbenzene	200000		--	--	--	--	--	--
m&p-Xylene			--	--	--	--	--	--
Methylene Chloride	21000	760000	--	--	--	--	670 J	--
Naphthalene	19000	10000000	--	--	--	110000	59000	--
n-Butylbenzene	24000		--	--	--	--	--	--
n-Propylbenzene	24000		--	--	--	--	--	--
o-Xylene			--	--	--	--	--	--
p-Isopropyltoluene			--	--	--	--	--	--
sec-Butylbenzene	22000		--	--	--	--	--	--
tert-Butylbenzene	39000		--	--	--	--	--	--
Tetrachloroethene	3400	110000	--	1.3	--	--	--	2
Toluene	52000	10000000	--	--	--	--	--	--
Trichloroethene	110	520000	--	1.7	--	--	--	3.6
Semivolatile Organic Analysis (UG/KG)								
2,4-Dimethylphenol	1200000	10000000	--	--	--	--	--	--
2,4-Dinitrophenol	120000	4100000	--	--	--	--	--	--
2-Methylnaphthalene		10000000	--	--	300 J	--	--	--
3,3'-Dichlorobenzidine	3800	13000	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol			--	--	--	--	--	--
4-Nitroaniline			--	--	--	--	--	--
4-Nitrophenol	700000		--	--	--	--	--	--
Acenaphthene	2900000	10000000	960	570 J	1900	390000	480000	3200
Acenaphthylene		10000000	--	--	120 J	--	--	--
Anthracene	10000000	10000000	3200	1300	3600	790000	970000	8700
Benzo(a)anthracene	2100	7800	8100	3500	8300	1600000	1900000	16000
Benzo(a)pyrene	210	800	4800	3000	6700	1300000	1500000	12000
Benzo(b)fluoranthene	2100	7800	4500	2600	6100	1100000	1300000	9700
Benzo(g,h,i)perylene		10000000	2400	1800	4100	720000	830000	6200
Benzo(k)fluoranthene	21000	78000	4600	2600	5600	1100000	1200000	10000
Benzoic acid	10000000		--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	120000	410000	--	--	--	--	--	--
Carbazole	86000		2800	680	2200	420000	490000	6000
Chrysene	210000	780000	7900	3300	7700	1400000	1700000	14000
Dibenzo(a,h)anthracene	210	800	1000	660	1600	280000 J	330000	2500 J
Dibenzofuran	310000		670	230 J	980	200000 J	250000 J	2500 J
Diethylphthalate	10000000	10000000	--	--	--	--	--	--
Di-n-Butylphthalate	6200000		--	--	--	--	--	--
Fluoranthene	2200000	10000000	21000	7900	20000	3800000	4600000	42000
Fluorene	2600000	10000000	1300	540 J	1800	390000	480000	4400
Indeno(1,2,3-cd)pyrene	2100	7800	2500	1800	4100	740000	850000	6700
Naphthalene	19000	10000000	220 J	100 J	710	170000 J	220000 J	1300 J
Pentachlorophenol	9000	48000	--	--	--	--	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			SOUTH MEADOW					
Sample Number			DA-S-TP15-0001-01	DA-S-TP15-0203-01	DA-S-TP15-0506-01	DA-S-TP15A-0203-01	DA-S-TP15A-0506-01	DA-S-TP15A-0910-01
Sample Location			TP15	TP15	TP15	TP15A	TP15A	TP15A
Date Sampled			8/12/2003	8/12/2003	8/12/2003	8/12/2003	8/12/2003	8/12/2003
Interval			0.0-1.0	2.0-3.0	5.0-6.0	2.0-3.0	5.0-6.0	9.0-10.0
QC Identifier			None	None	None	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Phenanthrene		10000000	15000	5200	15000	3000000	3500000	34000
Pyrene	2900000	10000000	17000	6400	16000	3000000	3600000	33000
Pesticide/PCB Analysis (UG/KG)								
4,4'-DDE	7000		--	--	--	--	--	--
4,4'-DDT	7000		--	--	--	--	--	--
alpha-Chlordane			--	--	--	--	--	--
Aroclor-1248	740		--	--	--	--	--	--
Aroclor-1254	740		--	--	--	--	--	44.5 J
Aroclor-1260	740		--	--	--	--	--	--
Aroclor-1268	1000		--	--	--	--	--	--
Toxaphene	1600		--	--	--	--	--	--
Total Metal Analysis (MG/KG)								
Aluminum	10000		8000	8500	9100	17000	15000	6500
Antimony	41	820	--	--	--	--	--	1.3
Arsenic	1.6	3.8	21.0 J	18.0 J	17.0 J	3.4 J	2.7 J	16.0 J
Barium	6700	10000	17.0	19.0	24.0	120	120	22.0
Beryllium	1900	1.3	0.33	0.31	0.39	2.5	2.4	0.31
Cadmium	45	1000	0.27 J	0.20 J	0.66 J	0.61 J	0.36 J	0.58 J
Calcium			600 J	1000 J	3400 J	53000 J	46000 J	1100 J
Chromium	64	10000	9.2 J	9.6 J	10.0 J	3.7	2.6	8.6 J
Cobalt	1900		10.0 J	9.8 J	9.8 J	4.4 J	3.4 J	8.5 J
Copper	4100	10000	18.0	19.0	23.0	13.0	11.0	26.0
Iron	10000		21000	20000	21000	4800	3800	17000
Lead	750	500	14.0	20.0	25.0	39.0	35.0	42.0
Magnesium			2200	2300	4000	24000	21000	1500
Manganese	1900	10000	310	280	340	770	770	280
Mercury	31	610	0.029 J	0.064 J	0.044 J	0.069 J	0.075 J	0.076 J
Molybdenum			--	--	--	--	--	--
Nickel	2000	10000	16.0	16.0	18.0	7.0	6.0	13.0
Potassium			180	160	280	3200	3400	140
Selenium	510	10000	--	--	--	0.32 J	0.36 J	--
Silver	510	10000	--	--	--	--	--	--
Sodium			--	--	--	1400	1500	--
Thallium	6.7	140	--	--	--	--	--	--
Vanadium	720	10000	14.0	13.0	14.0	21.0	18.0	12.0
Zinc	10000	10000	48.0	45.0	87.0	57.0	51.0	73.0
Total Petroleum Hydrocarbon Analysis (UG/KG)								
Diesel Range Organics		2,500,000	110000	150000	230000	50,000,000	63,000,000	200000
Gasoline Range Organics			700 J	6100 J	1900 J	51000	42000	4200 J
Miscellaneous Analysis (%)								
TOTAL SOLIDS			87.0	85.0	85.0	86.0	84.0	83.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			NORTH MEADOW					
Sample Number			DA-S-SB07-0102-01	DA-S-TP09-0001-01	DA-S-TP09-0102-01	DA-S-TP-DUP04-01	DA-S-TP10-0001-01	DA-S-TP10-0102-01
Sample Location			SB07	TP09	TP09	TP09	TP10	TP10
Date Sampled			8/18/2003	8/14/2003	8/14/2003	8/14/2003	8/14/2003	8/14/2003
Interval			1.0-2.0	0.0-1.0	1.0-2.0	1.0-2.0	0.0-1.0	1.0-2.0
QC Identifier			None	None	Field Dup. DA-S-TP09-0102-01	Field Dup. DA-S-TP09-0102-01	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Volatile Organic Analysis (UG/KG)								
1,2,4-Trimethylbenzene	17000		--	--	--	--	--	--
1,3,5-Trimethylbenzene	7000		--	--	--	--	--	--
2-Butanone	2700000	10000000	--	2.8 J	--	--	--	--
Acetone	600000	10000000	50	66 J	--	--	--	--
Carbon Disulfide	72000		--	--	--	--	--	--
Chloroform	1200	940000	--	--	--	--	--	--
cis-1,2-Dichloroethene	15000		--	--	--	--	--	--
Ethylbenzene	20000	10000000	--	--	--	--	--	--
Isopropylbenzene	200000		--	--	--	--	--	--
m&p-Xylene			--	--	--	--	--	--
Methylene Chloride	21000	760000	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
n-Butylbenzene	24000		--	--	--	--	--	--
n-Propylbenzene	24000		--	--	--	--	--	--
o-Xylene			--	--	--	--	--	--
p-Isopropyltoluene			--	--	--	--	--	--
sec-Butylbenzene	22000		--	--	--	--	--	--
tert-Butylbenzene	39000		--	--	--	--	--	--
Tetrachloroethene	3400	110000	--	--	--	--	--	--
Toluene	52000	10000000	--	--	--	--	--	--
Trichloroethene	110	520000	--	--	--	--	--	--
Semivolatile Organic Analysis (UG/KG)								
2,4-Dimethylphenol	1200000	10000000	--	--	--	--	--	--
2,4-Dinitrophenol	120000	4100000	--	--	--	--	--	--
2-Methylnaphthalene		10000000	--	--	--	--	--	--
3,3'-Dichlorobenzidine	3800	13000	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol			--	--	--	--	--	--
4-Nitroaniline			--	--	--	--	--	--
4-Nitrophenol	700000		--	--	--	--	--	--
Acenaphthene	2900000	10000000	--	--	--	--	--	--
Acenaphthylene		10000000	--	--	--	--	--	--
Anthracene	10000000	10000000	--	--	--	--	610 J	--
Benzo(a)anthracene	2100	7800	--	90 J	--	--	1300 J	120 J
Benzo(a)pyrene	210	800	--	--	--	--	1100 J	89 J
Benzo(b)fluoranthene	2100	7800	--	--	--	--	1300 J	--
Benzo(g,h,i)perylene		10000000	--	--	--	--	890 J	--
Benzo(k)fluoranthene	21000	78000	--	--	--	--	1100 J	86 J
Benzoic acid	10000000		--	5900 J	880 J	950 J	--	1100 J
bis(2-Ethylhexyl)phthalate	120000	410000	--	490 J	440 J	450 J	--	470 J
Carbazole	86000		--	--	--	--	480 J	--
Chrysene	210000	780000	--	120 J	--	--	1500 J	130 J
Dibenzo(a,h)anthracene	210	800	--	--	--	--	--	--
Dibenzofuran	310000		--	--	--	--	--	--
Diethylphthalate	10000000	10000000	--	--	--	--	--	--
Di-n-Butylphthalate	6200000		--	--	--	--	--	--
Fluoranthene	2200000	10000000	--	230 J	--	--	2900 J	280 J
Fluorene	2600000	10000000	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	2100	7800	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
Pentachlorophenol	9000	48000	--	--	--	--	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			NORTH MEADOW					
Sample Number			DA-S-SB07-0102-01	DA-S-TP09-0001-01	DA-S-TP09-0102-01	DA-S-TP-DUP04-01	DA-S-TP10-0001-01	DA-S-TP10-0102-01
Sample Location			SB07	TP09	TP09	TP09	TP10	TP10
Date Sampled			8/18/2003	8/14/2003	8/14/2003	8/14/2003	8/14/2003	8/14/2003
Interval			1.0-2.0	0.0-1.0	1.0-2.0	1.0-2.0	0.0-1.0	1.0-2.0
QC Identifier			None	None	Field Dup. DA-S-TP09-0102-01	Field Dup. DA-S-TP09-0102-01	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Phenanthrene		10000000	--	140 J	--	--	1900 J	220 J
Pyrene	2900000	10000000	--	200 J	--	--	2500 J	220 J
Pesticide/PCB Analysis (UG/KG)								
4,4'-DDE	7000		--	--	--	--	--	--
4,4'-DDT	7000		--	--	--	--	--	--
alpha-Chlordane			--	--	--	--	--	--
Aroclor-1248	740		--	--	--	--	--	--
Aroclor-1254	740		--	--	--	--	--	--
Aroclor-1260	740		--	--	--	--	117	--
Aroclor-1268	1000		--	--	--	--	--	--
Toxaphene	1600		--	--	--	--	--	--
Total Metal Analysis (MG/KG)								
Aluminum	10000		5400	8800	13000	12000	9200	11000
Antimony	41	820	--	--	--	--	5.5 J	--
Arsenic	1.6	3.8	31.0 J	11.0 J	11.0 J	10.0 J	15.0 J	13.0 J
Barium	6700	10000	8.2	10.0	11.0	9.5	36.0	17.0
Beryllium	1900	1.3	0.33	0.26 J	0.34 J	0.31 J	0.29 J	0.35 J
Cadmium	45	1000	--	--	--	--	0.84 J	--
Calcium			45.0	280 J	240 J	300 J	2500 J	480 J
Chromium	64	10000	8.1	11.0 J	15.0 J	14.0 J	64.0 J	13.0 J
Cobalt	1900		14.0	5.9	11.0	11.0	10.0	9.0
Copper	4100	10000	24.0	16.0	20.0	19.0	560	20.0
Iron	10000		22000	23000 J	31000 J	29000 J	27000 J	25000 J
Lead	750	500	6.8	25.0	10.0	9.3	160	15.0
Magnesium			1400	2100 J	3800 J	3700 J	2900 J	2600 J
Manganese	1900	10000	310	140	220	210	360	210
Mercury	31	610	0.012	0.12	0.024	0.022	0.098	0.041
Molybdenum			--	--	--	--	--	--
Nickel	2000	10000	20.0	14.0	22.0	22.0	18.0	18.0
Potassium			140	130	140	110	270	150
Selenium	510	10000	--	--	--	--	--	--
Silver	510	10000	--	0.35	--	--	--	--
Sodium			--	--	--	--	--	--
Thallium	6.7	140	--	--	--	--	--	--
Vanadium	720	10000	9.8	19.0	18.0	16.0	29.0	20.0
Zinc	10000	10000	40.0 J	35.0 J	50.0 J	48.0 J	280 J	50.0 J
Total Petroleum Hydrocarbon Analysis (UG/KG)								
Diesel Range Organics		2,500,000	--	96000	--	--	180000	--
Gasoline Range Organics			--	2300 J	940 J	970 J	1200 J	2900 J
Miscellaneous Analysis (%)								
TOTAL SOLIDS			87.0	78.0	84.0	84.0	74.0	80.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			NORTH MEADOW					
Sample Number			DA-S-TP11-0001-01	DA-S-TP11-0203-01	DA-S-TP-DUP03-01	DA-S-TP11-0304-01	DA-S-TP12-0001-01	DA-S-TP12-0102-01
Sample Location			TP11	TP11	TP11	TP11	TP12	TP12
Date Sampled			8/14/2003	8/14/2003	8/14/2003	8/14/2003	8/13/2003	8/13/2003
Interval			0.0-1.0	2.0-3.0	2.0-3.0	3.0-4.0	0.0-1.0	1.0-2.0
QC Identifier			None	Field Dup. DA-S-TP11-0203-01	Field Dup. DA-S-TP11-0203-01	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Volatile Organic Analysis (UG/KG)								
1,2,4-Trimethylbenzene	17000		--	--	--	--	--	--
1,3,5-Trimethylbenzene	7000		--	--	--	--	--	--
2-Butanone	2700000	10000000	--	--	--	--	--	--
Acetone	600000	10000000	--	--	--	--	--	--
Carbon Disulfide	72000		--	--	--	--	--	--
Chloroform	1200	940000	--	--	--	--	--	--
cis-1,2-Dichloroethene	15000		--	--	--	--	--	--
Ethylbenzene	20000	10000000	--	--	--	--	--	--
Isopropylbenzene	200000		--	--	--	--	--	--
m&p-Xylene			--	--	--	--	--	--
Methylene Chloride	21000	760000	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
n-Butylbenzene	24000		--	--	--	--	--	--
n-Propylbenzene	24000		--	--	--	--	--	--
o-Xylene			--	--	--	--	--	--
p-Isopropyltoluene			--	--	--	--	--	--
sec-Butylbenzene	22000		--	--	--	--	--	--
tert-Butylbenzene	39000		--	--	--	--	--	--
Tetrachloroethene	3400	110000	--	--	--	--	--	--
Toluene	52000	10000000	--	--	--	--	--	--
Trichloroethene	110	520000	--	--	--	--	--	--
Semivolatile Organic Analysis (UG/KG)								
2,4-Dimethylphenol	1200000	10000000	--	--	--	--	--	--
2,4-Dinitrophenol	120000	4100000	--	--	--	--	--	--
2-Methylnaphthalene		10000000	--	--	--	--	--	--
3,3'-Dichlorobenzidine	3800	13000	--	--	--	--	110 J	--
4,6-Dinitro-2-methylphenol			--	--	--	--	--	--
4-Nitroaniline			--	--	--	--	--	--
4-Nitrophenol	700000		--	--	--	--	--	--
Acenaphthene	2900000	10000000	--	--	--	--	--	--
Acenaphthylene		10000000	--	--	--	--	--	--
Anthracene	10000000	10000000	--	--	--	--	--	--
Benzo(a)anthracene	2100	7800	--	--	--	--	--	--
Benzo(a)pyrene	210	800	--	--	--	--	--	--
Benzo(b)fluoranthene	2100	7800	--	--	--	--	--	--
Benzo(g,h,i)perylene		10000000	--	--	--	--	--	--
Benzo(k)fluoranthene	21000	78000	--	--	--	--	--	--
Benzoic acid	10000000		1600 J	940 J	890 J	--	1100 J	--
bis(2-Ethylhexyl)phthalate	120000	410000	480 J	430 J	--	410 J	--	--
Carbazole	86000		--	--	--	--	--	--
Chrysene	210000	780000	--	--	--	--	--	--
Dibenzo(a,h)anthracene	210	800	--	--	--	--	--	--
Dibenzofuran	310000		--	--	--	--	--	--
Diethylphthalate	10000000	10000000	--	--	--	--	--	--
Di-n-Butylphthalate	6200000		--	--	--	--	--	--
Fluoranthene	2200000	10000000	--	--	--	--	--	--
Fluorene	2600000	10000000	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	2100	7800	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
Pentachlorophenol	9000	48000	--	--	--	--	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			NORTH MEADOW					
Sample Number			DA-S-TP11-0001-01	DA-S-TP11-0203-01	DA-S-TP-DUP03-01	DA-S-TP11-0304-01	DA-S-TP12-0001-01	DA-S-TP12-0102-01
Sample Location			TP11	TP11	TP11	TP11	TP12	TP12
Date Sampled			8/14/2003	8/14/2003	8/14/2003	8/14/2003	8/13/2003	8/13/2003
Interval			0.0-1.0	2.0-3.0	2.0-3.0	3.0-4.0	0.0-1.0	1.0-2.0
QC Identifier			None	Field Dup. DA-S-TP11-0203-01	Field Dup. DA-S-TP11-0203-01	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Phenanthrene		10000000	--	--	--	--	--	--
Pyrene	2900000	10000000	--	--	--	--	--	--
Pesticide/PCB Analysis (UG/KG)								
4,4'-DDE	7000		--	--	--	--	--	--
4,4'-DDT	7000		--	--	--	--	--	--
alpha-Chlordane			--	--	--	--	--	--
Aroclor-1248	740		--	--	--	--	--	--
Aroclor-1254	740		--	--	--	--	--	--
Aroclor-1260	740		--	--	--	--	--	--
Aroclor-1268	1000		--	--	--	--	--	--
Toxaphene	1600		--	--	--	--	--	--
Total Metal Analysis (MG/KG)								
Aluminum	10000		11000	13000	15000	17000	9500 J	8200
Antimony	41	820	--	--	--	--	--	--
Arsenic	1.6	3.8	19.0 J	14.0 J	16.0 J	14.0 J	14.0 J	19.0 J
Barium	6700	10000	16.0	11.0	13.0	7.6 J	16.0	16.0
Beryllium	1900	1.3	0.36 J	0.28 J	0.34 J	0.24 J	0.32 J	0.39 J
Cadmium	45	1000	--	--	--	--	--	--
Calcium			120 J	940 J	840 J	1900 J	220 J	83.0 J
Chromium	64	10000	12.0 J	14.0 J	14.0 J	16.0 J	12.0 J	11.0 J
Cobalt	1900		7.4	12.0	14.0	11.0	11.0	13.0
Copper	4100	10000	18.0	19.0	21.0	18.0	20.0	24.0
Iron	10000		30000	36000	41000	42000	27000 J	27000
Lead	750	500	17.0	8.5	9.6	14.0	7.8	6.4
Magnesium			2300 J	4200 J	4600 J	6400 J	2600 J	2200 J
Manganese	1900	10000	190	300	320	280	260	300
Mercury	31	610	0.061	0.015 J	0.015 J	0.0088 J	0.028	0.011 J
Molybdenum			--	--	--	1.0	--	--
Nickel	2000	10000	17.0	21.0	24.0	21.0	19.0	21.0
Potassium			180	130	150	81.0	200	170
Selenium	510	10000	--	--	--	--	--	--
Silver	510	10000	--	--	--	--	--	--
Sodium			--	--	--	--	--	--
Thallium	6.7	140	--	--	--	--	--	--
Vanadium	720	10000	24.0	24.0	27.0	22.0	15.0	15.0
Zinc	10000	10000	44.0 J	54.0 J	62.0 J	58.0 J	46.0 J	46.0 J
Total Petroleum Hydrocarbon Analysis (UG/KG)								
Diesel Range Organics		2,500,000	55000 J	--	--	--	--	--
Gasoline Range Organics			1400 J	1900 J	2000 J	1000 J	5600 J	1700 J
Miscellaneous Analysis (%)								
TOTAL SOLIDS			78.0	86.0	86.0	90.0	83.0	85.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			NORTH MEADOW					
Sample Number			DA-S-TP12-0203-01	DA-S-TP12A-0001-01	DA-S-TP12B-0001-01	DA-S-TP13-0001-01	DA-S-TP13-0203-01	DA-S-TP13-0405-01
Sample Location			TP12	TP12A	TP12B	TP13	TP13	TP13
Date Sampled			8/13/2003	8/15/2003	8/15/2003	8/15/2003	8/15/2003	8/15/2003
Interval			2.0-3.0	0.0-1.0	0.0-1.0	0.0-1.0	2.0-3.0	4.0-5.0
QC Identifier			None	None	None	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Volatile Organic Analysis (UG/KG)								
1,2,4-Trimethylbenzene	17000		--	--	1.4 J	1.2 J	1.1 J	--
1,3,5-Trimethylbenzene	7000		--	--	--	--	--	--
2-Butanone	2700000	10000000	--	--	--	--	--	--
Acetone	600000	10000000	--	--	--	9.9	--	--
Carbon Disulfide	72000		--	--	--	--	--	--
Chloroform	1200	940000	--	--	--	--	--	--
cis-1,2-Dichloroethene	15000		--	--	--	--	--	--
Ethylbenzene	20000	10000000	--	--	--	--	--	--
Isopropylbenzene	200000		--	--	--	--	--	--
m&p-Xylene			--	--	--	0.89 J	0.78 J	--
Methylene Chloride	21000	760000	--	--	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
n-Butylbenzene	24000		--	--	--	--	--	--
n-Propylbenzene	24000		--	--	--	--	--	--
o-Xylene			--	--	--	--	--	--
p-Isopropyltoluene			--	--	--	--	--	--
sec-Butylbenzene	22000		--	--	--	--	--	--
tert-Butylbenzene	39000		--	--	--	--	--	--
Tetrachloroethene	3400	110000	--	--	--	--	--	--
Toluene	52000	10000000	--	--	--	--	--	--
Trichloroethene	110	520000	--	--	--	--	--	--
Semivolatile Organic Analysis (UG/KG)								
2,4-Dimethylphenol	1200000	10000000	--	--	--	--	--	--
2,4-Dinitrophenol	120000	4100000	--	--	--	--	--	--
2-Methylnaphthalene		10000000	--	--	--	--	--	--
3,3'-Dichlorobenzidine	3800	13000	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol			--	--	--	--	--	--
4-Nitroaniline			--	--	--	--	--	--
4-Nitrophenol	700000		--	--	--	--	--	--
Acenaphthene	2900000	10000000	--	--	--	--	--	--
Acenaphthylene		10000000	--	290 J	--	--	--	--
Anthracene	10000000	10000000	--	420 J	--	--	--	--
Benzo(a)anthracene	2100	7800	--	810	150 J	--	--	--
Benzo(a)pyrene	210	800	--	740	--	--	--	--
Benzo(b)fluoranthene	2100	7800	--	1300	190 J	--	--	--
Benzo(g,h,i)perylene		10000000	--	510 J	--	--	--	--
Benzo(k)fluoranthene	21000	78000	--	1100	160 J	--	--	--
Benzoic acid	10000000		--	1500 J	3100 J	--	--	--
bis(2-Ethylhexyl)phthalate	120000	410000	--	--	--	--	--	--
Carbazole	86000		--	410 J	--	--	--	--
Chrysene	210000	780000	--	1300	200 J	--	--	--
Dibenzo(a,h)anthracene	210	800	--	--	--	--	--	--
Dibenzofuran	310000		--	--	--	--	--	--
Diethylphthalate	10000000	10000000	--	--	--	--	--	--
Di-n-Butylphthalate	6200000		--	--	--	--	--	--
Fluoranthene	2200000	10000000	--	1700	320 J	--	--	--
Fluorene	2600000	10000000	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	2100	7800	--	540 J	--	--	--	--
Naphthalene	19000	10000000	--	--	--	--	--	--
Pentachlorophenol	9000	48000	--	--	--	--	--	--

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-3 (cont.)
SUMMARY OF ANALYTICAL RESULTS - SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Area			NORTH MEADOW					
Sample Number			DA-S-TP12-0203-01	DA-S-TP12A-0001-01	DA-S-TP12B-0001-01	DA-S-TP13-0001-01	DA-S-TP13-0203-01	DA-S-TP13-0405-01
Sample Location			TP12	TP12A	TP12B	TP13	TP13	TP13
Date Sampled			8/13/2003	8/15/2003	8/15/2003	8/15/2003	8/15/2003	8/15/2003
Interval			2.0-3.0	0.0-1.0	0.0-1.0	0.0-1.0	2.0-3.0	4.0-5.0
QC Identifier			None	None	None	None	None	None
Criteria	Region 9 PRG Industrial Soil (0.1*nc)_2002	Soil Direct Exposure Industrial/ Commercial						
Phenanthrene		10000000	--	300 J	140 J	--	--	--
Pyrene	2900000	10000000	--	1800	290 J	--	--	--
Pesticide/PCB Analysis (UG/KG)								
4,4'-DDE	7000		--	--	--	--	--	--
4,4'-DDT	7000		--	--	--	--	--	--
alpha-Chlordane			--	--	--	--	--	--
Aroclor-1248	740		--	--	--	--	--	--
Aroclor-1254	740		--	--	--	--	--	--
Aroclor-1260	740		--	115 J	--	--	--	--
Aroclor-1268	1000		--	--	--	--	--	--
Toxaphene	1600		--	--	--	--	--	--
Total Metal Analysis (MG/KG)								
Aluminum	10000		10000	9000	10000	8700	7400	7400
Antimony	41	820	--	1.3	--	--	--	--
Arsenic	1.6	3.8	7.0 J	15.0	14.0	90.0	40.0	23.0
Barium	6700	10000	6.9	19.0	28.0	13.0	11.0	12.0
Beryllium	1900	1.3	0.26 J	0.30	0.38	0.42	0.39	0.36
Cadmium	45	1000	--	--	--	--	--	--
Calcium			700 J	460	370	39.0	70.0	160
Chromium	64	10000	13.0 J	13.0	12.0	9.5 J	9.4 J	8.8 J
Cobalt	1900		15.0	8.9	7.3	20.0	16.0	16.0
Copper	4100	10000	28.0	24.0	18.0	30.0	29.0	24.0
Iron	10000		25000	24000	24000	28000	28000	25000
Lead	750	500	14.0	36.0	40.0	11.0	6.9	6.2
Magnesium			3900 J	2400	2000	2400	2300	2300
Manganese	1900	10000	400	310	240	410	390	400
Mercury	31	610	--	0.0426	0.0742	--	--	--
Molybdenum			--	--	--	--	--	--
Nickel	2000	10000	22.0	17.0	16.0	26.0	25.0	23.0
Potassium			120	170	170	150	190	180
Selenium	510	10000	--	--	0.19 J	--	--	--
Silver	510	10000	--	--	0.74	--	--	--
Sodium			--	--	--	--	--	--
Thallium	6.7	140	--	--	--	--	--	--
Vanadium	720	10000	10.0	24.0	28.0	14.0	12.0	12.0
Zinc	10000	10000	51.0 J	72.0	68.0	59.0	52.0	46.0
Total Petroleum Hydrocarbon Analysis (UG/KG)								
Diesel Range Organics		2,500,000	--	11000	12000	--	--	--
Gasoline Range Organics			1400 J	--	--	--	--	--
Miscellaneous Analysis (%)								
TOTAL SOLIDS			89.0	79.0	74.0	87.0	87.0	89.0

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate; R - Rejected; NA - Not Analyzed

TABLE 4-4
TEST PIT EXCAVATION SUMMARY
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Test Pit Number and Date	Test Pit Description and Results[1]	Test Pit Length by Width (feet)	Test Pit Depth (feet bgs)	Depth of Fill (feet bgs)	Water Level Depth (ft bgs)	Sample Number	Sample Depth (ft bgs)	Headspace (ppm)	Notes
TP01 8/11/03	The test pit contained mixed fill throughout the entire depth. The excavated soils consisted of fill that included sand and gravel with brick, concrete, asphalt rubble, metal pipe and cable. Results: No visual or olfactory evidence contamination was observed throughout excavation.	8.5 by 3	6.75	0 – 6.75+	Not encountered	DA-S-TP01-0001-01	0-1	0.4	The excavation was terminated at 6.75 feet below ground surface (bgs) because of collapsing sidewalls.
						DA-S-TP01-0304-01	3-4	2.0	
						DA-S-TP01-0607-01	6-7	0.0	
TP02 8/13/03	The excavated material consisted of fill that included sand, gravel and cobbles with brick, concrete, metal drum debris. In addition, a crushed and corroded drums with a black, tar-like residue were removed from the excavation. The black residue was reported to have a petroleum odor. At RIDEMs request, a sample of the tar-like residue was collected for laboratory analyses. Results: Visual and olfactory evidence of petroleum contamination was present from the drum residue.	17 by 5	6	0 – 6+	Not encountered	DA-S-TP02-0001-01	0-1	1.2	The excavation was terminated at 6 feet below ground surface (bgs) because of concern for potential contaminant transfer to deeper soils or groundwater. Other drum carcasses were visible in the sidewalls and bottom of excavation but were not removed at this time.
						DA-S-TP02-0102-01 (tar-like substance)	1-2	0.0	
						DA-S-TP02-0203-01/ DA-S-TP-DUP02-01 (drum residue)	2-3	10.5	
						DA-S-TP02-0506-01	5-6	0.0	
TP03	Not Performed, replaced by soil borings								
TP04	Not Performed, replaced by soil borings								
TP05 8/11/03	The excavated soils consisted of sand, gravel, cobbles, and boulders with some concrete debris. A layer of stained soil was noted at 6.5 feet bgs. Results: A dark stained layer of soil was observed at 6.5 ft. bgs. No visual evidence of contamination was observed in groundwater entering the excavation. Samples were collected from three locations for organic vapor headspace screening.	9.5 by 4	10.5	0 – 6.5	10.2	DA-S-TP05-0001-01	0-1	0.0	The excavation was terminated at 10.5 feet after encountering groundwater.
						DA-S-TP05-0607-01	6-7	0.0	
						DA-S-TP05-0910-01 DA-S-TP-DUP01-01	9-10	0.0	
TP-06 8/13/03	The excavated soils consisted of silty sand and some gravel with brick, concrete, burlap, and asphalt/roofing tar paper. The fill debris did not extend deeper than 5 feet bgs at this location. Possible organic sheen on groundwater. Results: No visual or olfactory evidence of contamination was observed throughout excavation of the test pit	22 by 5	10	0 - 5	~10	DA-S-TP06-0001-01	0-1	0.0	The excavation was terminated at 10 feet below ground surface (bgs) after encountering bedrock.
						DA-S-TP06-0304-01	3-4	0.0	
						DA-S-TP06-0910-01	9-10		
TP-07 8/12/03	The excavated soils consisted of sand and gravel fill that included brick, cinder blocks, coal ash, concrete with rebar, metal debris, insulated pipe, and plastic. Black soil was observed mixed with brick and concrete which was included in 3-4 foot interval sample. Results: No visual evidence of contamination was observed.	15 by 5	10	0 – 10 +	Not encountered	DA-S-TP07-0001-01	0-1	5.6	The excavation was terminated at 10 feet below ground surface (bgs) due to sidewall collapse.
						DA-S-TP07-0304-01 (targeted soil around black layer)	3-4	0.0	
						DA-S-TP0-0910-01	9-10	0.0	

TABLE 4-4 (cont.)
TEST PIT EXCAVATION SUMMARY
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Test Pit Number and Date	Test Pit Description and Results[1]	Test Pit Length by Width (feet)	Test Pit Depth (feet bgs)	Depth of Fill (feet bgs)	Water Level Depth (ft bgs)	Sample Number	Sample Depth (ft bgs)	Headspace (ppm)	Notes
TP08 8/15/03	The excavated material consisted of sandy silt and gravel, concrete with rebar (concrete curbing), slag, and a material resembling tar paper. Results: Tar paper material was included in headspace jar for the 7-8 foot depth interval.	13 by 4	8	0 – 8+	Not encountered	DA-S-TP08-0001-01	0-1	0.0	The excavation was terminated at 8 feet bgs because of excavator refusal on layer of concrete curbing.
						DA-S-TP08-0304-01 DA-S-TP-DUP05-01	3-4	0.0	
						DA-S-TP08-0708-01	7-8	17	
TP09 8/14/03	The excavated soils consisted of sand and some silt. Native soil over shallow bedrock with no fill/debris observed. Results: No visual or olfactory evidence of contamination was observed.	11 by 3	3	N/A	Not encountered	DA-S-TP09-0001-01	0-1	0.0	The excavation was terminated at 3 feet bgs because bedrock was encountered.
						DA-S-TP09-0102-01/ DA-S-TP-DUP04-01	1-2	0.0	
TP10 8/14/03	The excavated soils contained fill debris from 0 to 0.5 feet bgs. Results: Native soils (till-dense sandy silt, some gravel) from 0.5 to bedrock refusal at 2.5 feet bgs.	11 by 3	3	0 – 0.5	Not encountered	DA-S-TP10-0001-01	0-1	8.1	The excavation was terminated at 2.5 feet bgs because bedrock was encountered.
						DA-S-TP10-0102-01	1-2	21.2	
TP11 8/14/03	Test pit soils appear to be native soils (sand with variable amounts of silt and gravel) with bedrock encountered at 4.5 feet bgs. Location of soil gas TCE hit. Results: No fill or debris observed.	12 by 3	4.5	N/A	Not encountered	DA-S-TP11-0001-01	0-1	2.6	The excavation was terminated at 4.5 feet bgs because bedrock was encountered.
						DA-S-TP11-0203-01 DA-S-TP-DUP03-01	2-3	0.0	
						DA-S-TP11-0304-01	3-4	0.0	
TP12 8/13/03	Test pit soils appear to be native (sand, silt, gravel, cobbles) with weathered bedrock encountered at 3 feet bgs (broken rock) and more competent bedrock at 6 feet bgs. Results: No fill or debris observed.	12 by 3.5	6	N/A	Not encountered	DA-S-TP12-0001-01	0-1	0.0	The excavation was terminated at 6 feet bgs because bedrock was encountered.
						DA-S-TP12-0102-01	1-2	0.0	
						DA-S-TP12-0203-01	2-3	0.0	
TP12A 8/15/03	Test pit soils consisted of a silty sand with man-made debris including, a steel frame/beam, aluminum sheet material, plastic, fiberglass panel, and metal wire. Test pit was conducted on hillside slope upon request of RIDEM onsite representative to investigate magnetic anomaly found using a Schonstedt Magnetic Locator. Bedrock was encountered at 2.5 feet bgs. Results: No visual or olfactory evidence of contamination was observed throughout excavation.	6 by 3	4	0 – 2.5	Not encountered	DA-S-TP12A-0001-01	0-1	0.0	The excavation was terminated at 4 feet bgs because bedrock was encountered.
TP12B 8/15/03	Test pit soils consisted of a fill of sand and silt with some gravel that contained a piece of steel pipe. Test pit was excavated upon request of RIDEM onsite representative to investigate magnetic anomaly found using a Schonstedt Magnetic Locator. Bedrock was encountered at 2.5 feet bgs. Results: No visual or olfactory evidence of contamination was observed throughout excavation.	5 by 3	2.5	0 – 0.5	Not encountered	DA-S-TP12B-0001-01	0-1	0.0	The excavation was terminated at 2.5 feet bgs because bedrock was encountered.
TP13 8/11/03	Test pit excavated soils consisted of sand and gravel with some boulders. No fill or debris observed. Appears to be native soil. Results: No visual or olfactory evidence of contamination was observed throughout excavation.	13.5 by 3	7	N/A	Not encountered	DA-S-TP13-0001-01	0-1	5.2	The excavation was terminated at 7 feet bgs because bedrock was encountered.
						DA-S-TP13-0203-01	2-3	0.0	
						DA-S-TP13-0405-01	4-5	4.1	

TABLE 4-4 (cont.)
TEST PIT EXCAVATION SUMMARY
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Test Pit Number and Date	Test Pit Description and Results[1]	Test Pit Length by Width (feet)	Test Pit Depth (feet bgs)	Depth of Fill (feet bgs)	Water Level Depth (ft bgs)	Sample Number	Sample Depth (ft bgs)	Headspace (ppm)	Notes
TP14 8/14/03	Test pit excavated soils consisted of sand with some silt and gravel. Debris was first encountered at 3 feet bgs and included corroded cans and circular mesh screens. Metal strapping, and concrete with rebar debris was observed 6-8 feet bgs. No debris was observed below 8 feet bgs. Results: A large number of open-ended cans (approximately 6 inches in length) were observed at 3 to 6 feet bgs. The cans appear to have been pressurized at one time and are associated with mesh screens. No visual or olfactory evidence of contamination was observed.	16.5 by 4.5	10.5	0 - 8	10.5	DA-S-TP14-0001-01	0-1	1.2	The excavation was terminated at 10.5 feet bgs after encountering groundwater on top of rock.
						DA-S-TP14-0506-01	5-6	1.8	
						DA-S-TP14-0910-01	9-10	2.1	
TP-15 8/12/03	Test pit excavated fill soils consisted of silty sand with a 5-gallon container that had a black tar-like residue, an empty 15-gallon poly container, and a rusted, empty 55-gallon drum carcass. All instrument screening for VOCs was 0 ppm for these objects. Other debris encountered included brick, concrete slabs (2-4 feet wide by 3 feet long), wood, metal pipe, nails, wire, and rubber hose. Results: All fill material. No visibly stained soils were observed.	10 by 6	6	0 – 6+	Not encountered	DA-S-TP15-0001-01	0-1	0.0	The excavation was terminated at 6 feet bgs because a massive concrete slab (>6 feet wide) was encountered and sidewalls were collapsing.
						DA-S-TP15-0203-01	2-3	0.0	
						DA-S-TP15-0506-01	5-6	0.0	
TP-15A 8/12/03	Test pit excavated fill consisted of silty sand and gravel containing debris which was present throughout the entire excavation. A black layer that was thought to be asphalt was observed at 3-6 feet bgs. At the request of RIDEM representative, this test pit was excavated perpendicular to TP15.	15 by 6	10	0 – 10+	Not encountered	DA-S-TP15A-0203-01	2-3	0.0	The excavation was terminated at 10 feet bgs because sidewalls were collapsing.
						DA-S-TP15A-0506-01 (black material)	5-6	0.0	
						DA-S-TP15A-0910-01	9-10	0.0	

(1) See test pit logs for details

TABLE 4-5
SOIL BORINGS SAMPLE SUMMARY
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Soil Boring Number	Boring Depth (ft. bgs)	Depth of Fill (ft. bgs)	Sample Number	Sample Depth (ft. bgs)	FID Headspace (ppm)	Notes
SB01	14 (bedrock refusal)	Undetermined (possibly 0–2)	DA-S-SB01-0102-01 DA-S-SB01-5575-01 DA-S-SB01-0809-01	1-2 5.5-7.5 8-9	50.1 2.3 18	Bedrock at 11 ft. bgs
SB02	8.5 (bedrock refusal)	0-1	DA-S-SB02-0102-01 DA-S-SB02-0304-01 DA-S-SB02-5565-01	1-2 3-4 5.5-6.5	209.5 17.3 35.6	Bedrock at 7.5 ft. bgs
SB03	14 (bedrock refusal)	0-2.5	DA-S-SB03-0102-01 DA-S-SB03-0304-01 DA-S-SB03-0607-01	1-2 3-4 6-7	572.3 345.7 167.9	Bedrock at 13.5 ft. bgs Till at 8 ft. bgs
SB04	13 (bedrock refusal)	Undetermined (possibly 0-2.5)	DA-S-SB04-0102-01 DA-S-SB04-2535-01 DA-S-SB04-0910-01 DA-S-SB-DUP06-01	1-2 2.5-3.5 9-10 9-10	0 1021 237 n/a	Duplicate from the 9-10 ft. interval Strong odors at 3-4 ft. bgs Possible till at 11 ft. bgs Bedrock at 13 ft. bgs
SB05	5.5 (bedrock refusal)	Undetermined (possible 0-5.5)	DA-S-SB05-0102-01 DA-S-SB05-0203-01 DA-S-SB05-0304-01	1-2 2-3 3-4	0 5.7 9.7	Bedrock at 5.5 ft. bgs
SB06	7.5 (bedrock refusal)	2.5	DA-S-SB06-0515-01 DA-S-SB06-2535-01	0.5-1.5 2.5-3.5	0 19.3	Bedrock at 3.5 ft. bgs
SB07	10 (refusal)	None likely	DA-S-SB07-0102-01	1-2	0	Weathered bedrock at 2 ft. bgs
SB08	7.0 (bedrock refusal)	0-3	DA-S-SB08-0102-01 DA-S-SB08-0607-01 DA-S-SB-DUP07-01	1-2 6-7 6-7	0 2.5 n/a	Bedrock at 7.0 ft. bgs Till at 6.0 ft. bgs
MW04B	45	Undetermined (possibly 0-15)	DA-S-MW04B-0810-01 DA-S-MW04B-1416-01	8-10 14-16	2.8 1.0	Completed as bedrock monitoring well (MW04B) Bedrock encountered at 15 ft. bgs

ft. = feet
bgs = below ground surface
ppm = parts per million
n/a = not applicable

TABLE 4-6
SUMMARY OF ANALYTICAL RESULTS - GROUNDWATER
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Sample Number			DA-A-MW01B-01	DA-A-MW-DUP08-01	DA-A-MW02B-01	DA-A-MW03B-01	DA-A-MW04B-01
Sample Location			MW01B	MW01B	MW02B	MW03B	MW04B
Date Sampled			9/4/2003	9/4/2003	9/3/2003	9/5/2003	9/4/2003
Interval			0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0
QC Identifier			Field Dup. DA-A-MW01B-01	Field Dup. DA-A-MW01B-01	None	None	None
Criteria	GA Groundwater Objective	MCL					
Volatile Organic Analysis (UG/L)							
1,1,1-Trichloroethane	200	200	--	--	--	--	0.46 J
1,1-Dichloroethane			--	--	--	--	49
cis-1,2-Dichloroethene	70	70	2.1	2.3	0.61	--	6.4
Isopropylbenzene			--	--	0.33 J	--	--
sec-Butylbenzene			--	--	3.3	--	--
tert-Butylbenzene			--	--	0.97 J	--	--
Tetrachloroethene	5	5	1.9	2.5	--	--	8.4
Trichloroethene	5	5	1.3	1.6	0.42 J	1500	3.6
Vinyl Chloride	2	2	--	--	--	--	0.66 J
Total Metal Analysis (UG/L)							
Aluminum			97.0	57.0	29.0 J	29.0 J	21.0 J
Arsenic		10	--	--	26.1	--	--
Barium	2000	2000	12.0	9.9	30.0	9.1	--
Cadmium	5	5	10.2	7.9	--	--	--
Calcium			28000	23000	16000	22000	41000
Cobalt			--	--	9.6	--	--
Copper		1300	1.9 J	--	--	--	--
Iron			120	120	27000	--	--
Lead	15	15	--	5.88 J	--	--	--
Magnesium			7800	5900	2600	7800	11000
Manganese			110	110	8400	81.0	1200
Mercury	2	2	0.26	0.24	--	--	--
Molybdenum			--	--	--	--	1.3 J
Nickel	100		--	--	1.82 J	--	--
Potassium			1600	1500	2300	2300	--
Selenium	50	50	2.56 J	--	--	--	--
Sodium			10000	9600	6100	15000	12000
Zinc			4.0 J	2.5 J	8.1	3.3 J	3.3 J

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
R - Rejected; NA - Not Analyzed

TABLE 4-6 (cont.)
SUMMARY OF ANALYTICAL RESULTS - GROUNDWATER
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Sample Number			DA-A-MW01B-01	DA-A-MW-DUP08-01	DA-A-MW02B-01	DA-A-MW03B-01	DA-A-MW04B-01
Sample Location			MW01B	MW01B	MW02B	MW03B	MW04B
Date Sampled			9/4/2003	9/4/2003	9/3/2003	9/5/2003	9/4/2003
Interval			0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0	0.0-0.0
QC Identifier			Field Dup. DA-A-MW01B-01	Field Dup. DA-A-MW01B-01	None	None	None
Criteria	GA Groundwater Objective	MCL					
Dissolved Metal Analysis (UG/L)							
Aluminum			--	22.0 J	24.0 J	--	20.0 J
Barium	2000	2000	160 J	630 J	23.0	9.0 J	--
Cadmium	5	5	9.55	7.45	--	--	--
Calcium			29000	29000	15000	22000	42000
Cobalt			--	--	8.6	--	--
Copper		1300	--	2.3 J	--	--	--
Iron			--	--	14000	--	--
Magnesium			7900	7900	2400	7700	12000
Manganese			150	160	8100	78.0	1200
Mercury	2	2	0.18	0.16	--	--	--
Nickel	100		1.93 J	--	--	--	--
Potassium			1700	1300	2200	2300	--
Sodium			11000 J	16000 J	5900	15000 J	13000 J
Zinc			33.0 J	260 J	7.0	--	3.3 J

Black Background = Criteria Exceeded; U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
R - Rejected; NA - Not Analyzed

TABLE 7-1
SELECTION OF EXPOSURE PATHWAYS
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Scenario Timeframe	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soils	Exposed Surface Soils (0 to 1 foot	On-site Commercial Worker	Adult	Ingestion	Qual	Commercial workers are expected to be exposed to soil through inadvertent contact.
					Dermal	Qual	Commercial workers are expected to be exposed to soil through inadvertent contact.
					Inhalation	Qual	Commercial workers may be exposed to soil through inhalation of fugitive dust.
Current/Future	Sediment	Sediment	On-site Commercial Worker	Adult	Ingestion	Qual	Commercial workers are expected to be exposed to sediment through inadvertent contact.
					Dermal	Qual	Commercial workers are expected to be exposed to sediment through inadvertent contact.
Future	Soils	All Soil (0 to 15 feet bgs)	On-site Commercial Worker	Adult	Ingestion	Qual	Commercial workers are expected to be exposed to soil through inadvertent contact.
					Dermal	Qual	Commercial workers are expected to be exposed to soil through inadvertent contact.
					Inhalation	Qual	Commercial workers may be exposed to soil through inhalation of fugitive dust.
Future	Groundwater/Surface water	Groundwater/ Surface Water	Off-site Nearby Residents	Adult/Child	Ingestion	Qual	Residents down-gradient or nearby may be exposed to groundwater through use of groundwater/surface water as primary drinking water source.

TABLE 7-2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Exposure Medium: Sediment
Exposure Point: NUSC Disposal Area

Parameter	Frequency of Detection	Minimum Concentration[1]		Maximum Concentration[1]		Range of Detection Limits	Location of Maximum Detection	Concentration Used for Screening[2]	Background Value[3]	Screening Value[4]	Potential ARAR/TBC Value[5]	COPC Flag	COPC Flag Rationale[6]
Volatile Organics (ug/kg)													
1,1,1-TRICHLOROETHANE	3/9	0.95		2.3		0.36 -1.1	DA-SW/SD-02	1.6	NA	690000 sat	10000000	NO	BSL
1,1-DICHLOROETHANE	1/9	0.71	J	0.71	J	0.32 -1.1	DA-SW/SD-02	0.44	NA	170000 nc	10000000	NO	BSL
1,2,4-TRICHLOROBENZENE	1/9	6.2	J	6.2	J	0.25 -4.6	DA-SW/SD-09	6.2	NA	300000 nc	10000000	NO	BSL
2-BUTANONE	4/9	11	J	69	J	0.31 -0.53	DA-SW/SD-07	27.2	NA	2700000 nc	10000000	NO	BSL
4-ISOPROPYLTOLUENE	1/9	0.79	J	0.79	J	0.26 -0.9	DA-SW/SD-04	0.55	NA	---	---	NO	NTX
ACETONE	4/9	34	J	180	J	5.2 -8.8	DA-SW/SD-07	75.2	NA	600000 nc	10000000	NO	BSL
CARBON DISULFIDE	1/9	2.7	J	2.7	J	0.33 -1.2	DA-SW/SD-09	0.99	NA	72000 nc	---	NO	BSL
CHLOROETHANE	1/9	1.6	J	1.6	J	0.23 -0.8	DA-SW/SD-01	0.86	NA	65000 ca	---	NO	BSL
DICHLORODIFLUOROMETHANE	6/9	2.4	J	66	J	0.42 -1.2	DA-SW/SD-01	66	NA	31000 nc	---	NO	BSL
TOTAL XYLENES	1/9	2.2	J	2.2	J	0.66 -2	DA-SW/SD-01	1.4	NA	90000 sat	---	NO	BSL
TETRACHLOROETHENE	1/9	15		15		0.26 -0.91	DA-SW/SD-06	4.5	NA	3400 ca	110000	NO	BSL
TOLUENE	1/9	38	J	38	J	0.23 -0.77	DA-SW/SD-07	10.8	NA	220000 sat	10000000	NO	BSL
TRICHLOROETHENE	1/9	14		14		0.29 -1	DA-SW/SD-06	4.2	NA	110 ca	520000	NO	BSL
Semivolatile Organics (ug/kg)													
ACENAPHTHENE	1/9	780		780		52 -200	DA-SW/SD-03	267	NA	2900000 nc	10000000	NO	BSL
ANTHRACENE	4/9	87	J	2000		53 -140	DA-SW/SD-03	1814	NA	100000000 nc	10000000	NO	BSL
BENZO(A)ANTHRACENE	6/9	140	J	3400		96 -430	DA-SW/SD-03	3400	NA	2100 ca	7800	YES	ASL
BENZO(A)PYRENE	5/9	310	J	2600		99 -360	DA-SW/SD-03	2600	NA	210 ca	800	YES	ASL
BENZO(B)FLUORANTHENE	5/9	310	J	2300		120 -320	DA-SW/SD-03	2300	NA	2100 ca	7800	YES	ASL
BENZO(G,H,I)PERYLENE	5/9	420	J	1900		140 -270	DA-SW/SD-03	1900	NA	2900000 nc	10000000	NO	BSL
BENZO(K)FLUORANTHENE	7/9	100	J	2300		93 -310	DA-SW/SD-03	2300	NA	21000 ca	78000	NO	BSL
BENZOIC ACID	8/9	980	J	2700	J	300 -1200	DA-SW/SD-08	2314	NA	100000000 nc	---	NO	BSL
BENZYL ALCOHOL	1/9	400	J	400	J	230 -570	DA-SW/SD-01	285	NA	100000000 nc	---	NO	BSL
BIS(2-ETHYLHEXYL)PHTHALATE	6/9	560	J	2300	J	560 -980	DA-SW/SD-08, DA-SW/SD-09	2087	NA	120000 ca	410000	NO	BSL
CARBAZOLE	1/9	1300		1300		92 -230	DA-SW/SD-03	417	NA	86000 ca	---	NO	BSL
CHRYSENE	7/9	140	J	3300		98 -420	DA-SW/SD-03	3300	NA	210000 ca	780000	NO	BSL
DI-N-BUTYL PHTHALATE	1/9	100	J	100	J	93 -230	DA-SW/SD-03	97.2	NA	6200000 nc	---	NO	BSL
DIBENZO(A,H)ANTHRACENE	1/9	640	J	640	J	170 -430	DA-SW/SD-03	276	NA	210 ca	800	YES	ASL
DIBENZOFURAN	1/9	550	J	550	J	23 -360	DA-SW/SD-03	550	NA	310000 nc	---	NO	BSL
DIETHYL PHTHALATE	4/9	420	J	2000		83 -530	DA-SW/SD-09	2000	NA	49000000 max	10000000	NO	BSL
FLUORANTHENE	8/9	140	J	8500		80	DA-SW/SD-03	8500	NA	2200000 nc	10000000	NO	BSL
FLUORENE	1/9	1000		1000		60 -200	DA-SW/SD-03	323	NA	2600000 nc	10000000	NO	BSL
HIGH MOLECULAR WEIGHT PAHS	8/9	260		25440		170	DA-SW/SD-03	25440	NA	---	---	NO	NTX
INDENO(1,2,3-CD)PYRENE	4/9	640	J	1700		190 -270	DA-SW/SD-03	772	NA	2100 ca	7800	NO	BSL
LOW MOLECULAR WEIGHT PAHS	6/9	84		11920		260 -550	DA-SW/SD-03	11920	NA	---	---	NO	NTX
NAPHTHALENE, OS	1/9	140	J	140	J	100 -250	DA-SW/SD-03	115	NA	19000 nc	10000000	NO	BSL
PHENANTHRENE	6/9	84	J	8000		80 -550	DA-SW/SD-03	8000	NA	2900000 nc	10000000	NO	BSL
PYRENE	6/9	120	J	7000		87 -2000	DA-SW/SD-03	7000	NA	2900000 nc	10000000	NO	BSL
TOTAL PAHS	8/9	344		37360		260	DA-SW/SD-03	37360	NA	---	---	NO	NTX

TABLE 7-2.1 (cont.)
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection	Minimum Concentration[1]	Maximum Concentration[1]	Range of Detection Limits	Location of Maximum Detection	Concentration Used for Screening[2]	Background Value[3]	Screening Value[4]	Potential ARAR/TBC Value[5]	COPC Flag	COPC Flag Rationale[6]
Pesticides/PCBs (ug/kg)											
4,4'-DDE	1/9	13.4 J	13.4 J	7.41 -99	DA-SW/SD-02	8.7	NA	7000 ca	---	NO	BSL
ALPHA-CHLORDANE	1/9	19.1 J	19.1 J	5.88 -34.5	DA-SW/SD-04	13.9	NA	6500 ca	---	NO	BSL
AROCLOR-1260	3/9	100 J	450 J	25.5 -63.2	DA-SW/SD-07	450	NA	740 ca	---	NO	BSL
AROCLOR-1268	2/9	64.4 J	2480	45.1 -112	DA-SW/SD-07	723	NA	1000 ca	---	NO	BSL
DIELDRIN	3/9	14.4 J	61.3 J	6.48 -40.2	DA-SW/SD-07	42.1	NA	110 ca	400	NO	BSL
TOTAL DDT	1/9	13.4	13.4	15.7 -99	DA-SW/SD-02	13.4	NA	7000 ca	---	NO	BSL
TOTAL AROCLORS (Aroclors 1260, 1268)	3/9	164.4	**2930**	45.1 -112	DA-SW/SD-07	874	NA	1000 ca	---	NO	BSL
Metals (mg/kg)											
ALUMINUM	9/9	5000	20000	---	DA-SW/SD-09	15053	NA		---	NO	EPA-1
ARSENIC	9/9	11	25	---	DA-SW/SD-09	21	NA	1.6 ca	3.8	YES	ASL
BARIUM	9/9	17	82	---	DA-SW/SD-09	61	NA	6700 nc	10000	NO	BSL
BERYLLIUM	9/9	0.3	0.75	---	DA-SW/SD-09	0.58	NA	1900 nc	1.3	NO	BSL
CADMIUM	9/9	0.17 J	2.4 J	---	DA-SW/SD-06	2.4	NA	45 nc	1000	NO	BSL
CALCIUM	9/9	710	2700	---	DA-SW/SD-07	2204	NA	---	---	NO	NUT
CHROMIUM	9/9	6.5	23	---	DA-SW/SD-09	18.9	NA	64 ca	10000	NO	BSL
COBALT	9/9	8.1	180	---	DA-SW/SD-02	175	NA	---	---	NO	EPA-1
COPPER	9/9	9.1	58 J	---	DA-SW/SD-08	48	NA	---	---	NO	EPA-1
IRON	9/9	14000	40000 J	---	DA-SW/SD-08	30602	NA	---	---	NO	EPA-1
LEAD	9/9	14	770	---	DA-SW/SD-06	770	NA	750 nc	500	YES	ASL
MAGNESIUM	9/9	1000	3200	---	DA-SW/SD-09	2568	NA	---	---	NO	NUT
MANGANESE	9/9	200	2800	---	DA-SW/SD-07	2406	NA	1900 nc	10000	YES	ASL
MERCURY	9/9	0.0639 J	0.33 J	---	DA-SW/SD-08	0.29	NA	31 nc	610	NO	BSL
MOLYBDENUM	8/9	3.1	8.8	0.21	DA-SW/SD-09	6.1	NA	510 nc	---	NO	BSL
NICKEL	9/9	11	28	---	DA-SW/SD-09	25	NA	2000 nc	10000	NO	BSL
POTASSIUM	8/9	150	690	83	DA-SW/SD-09	690	NA	---	---	NO	NUT
SILVER	9/9	0.16 J	4.8 J	---	DA-SW/SD-03	4.8	NA	510 nc	10000	NO	BSL
VANADIUM	9/9	12	40	---	DA-SW/SD-09	32.7	NA	720 nc	10000	NO	BSL
ZINC	9/9	36	200 J	---	DA-SW/SD-08	163	NA	10000 nc	10000	NO	BSL

(1) Minimum/maximum detected concentration - field duplicate sample results not averaged. Bolding indicates maximum value is greater than the screening toxicity value.
(2) 95% UCL, or maximum detected concentration if the 95% UCL > maximum detected concentration (also the Reasonable Maximum Exposure (RME)).
(3) NA - No background values available.
(4) Region IX PRG industrial soil November 2002. Region IX PRGs for non-carcinogens have been adjusted by a factor of 0.1 to correspond to an HI of 0.1.
(5) Rhode Island Department of Environmental Management Soil Direct Exposure, Industrial/Commercial.
(6) Rationale Codes: Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Screening Toxicity Value (NTX)
Below Screening Level (BSL) Essential Nutrient (NUT)
EPA Region I does not advocate quantitative risk evaluation of this contaminant (EPA-1)

Definitions: NA = Not Applicable

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
J = Estimated Value
ca = Carcinogenic
nc = Non-Carcinogenic
sat = Region IX PRG for non-carcinogen was based on saturation. The value shown is the lesser of the saturation or 1/10 of the original Region IX PRG.
ca* = where nc < 100 x ca
max = Region IX PRG for this non-carcinogen was based on a ceiling limit. The value shown is the lesser of the ceiling limit or 1/10 of the original Region IX PRG.

TABLE 7-2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Scenario Timeframe: Current
Exposure Medium: Surface Soil (0 - 1 foot)
Exposure Point: NUSC Disposal Area

Parameter	Frequency of Detection	Minimum Concentration[1]	Maximum Concentration[1]	Range of Detection Limits	Location of Maximum Concentration	Concentration Used for Screening[2]	Background Value[3]	Screening Value[4]	Potential ARAR/TBC Value[5]	COPC Flag	COPC Flag Rationale[6]
Volatile Organics (ug/kg)											
1,2,4-TRIMETHYLBENZENE	3/15	1.2 J	1600	0.23 - 0.39	DA-TP-01	275	NA	17000 nc	---	NO	BSL
1,3,5-TRIMETHYLBENZENE	1/15	860 J	860 J	0.19 - 0.33	DA-TP-01	148	NA	7000 nc	---	NO	BSL
2-BUTANONE	1/15	2.8 J	2.8 J	0.29 - 660	DA-TP-09	2.8	NA	2700000 nc	10000000	NO	BSL
4-ISOPROPYLTOLUENE	1/15	260	260	0.24 - 0.41	DA-TP-01	44.7	NA	---	---	NO	NTX
ACETONE	2/15	9.9	66 J	4.7 - 590	DA-TP-09	58.3	NA	600000 nc	10000000	NO	BSL
TOTAL XYLENES	3/15	0.79 J	580	0.53 - 0.92	DA-TP-01	99.5	NA	90000 sat	---	NO	BSL
N-BUTYLBENZENE	1/15	260	260	0.27 - 0.47	DA-TP-01	44.9	NA	220000 sat	---	NO	BSL
N-PROPYLBENZENE	1/15	300	300	0.25 - 0.42	DA-TP-01	52.5	NA	220000 sat	---	NO	BSL
NAPHTHALENE	1/15	780 J	780 J	3.6 - 6.2	DA-TP-01	137	NA	19000 nc	10000000	NO	BSL
Semivolatile Organics (ug/kg)											
3,3'-DICHLOROBENZIDINE	1/15	110 J	110 J	100 - 600	DA-TP-12	101	NA	3800 ca	13000	NO	BSL
ACENAPHTHENE	5/15	110 J	960	66 - 390	DA-TP-15	236	NA	2900000 nc	10000000	NO	BSL
ACENAPHTHYLENE	1/15	290 J	290 J	85 - 510	DA-TP-12A	109	NA	2900000 nc	10000000	NO	BSL
ANTHRACENE	9/15	52 J	3200	44 - 51	DA-TP-15	744	NA	100000000 nc	10000000	NO	BSL
BENZO(A)ANTHRACENE	11/15	90 J	8100	79 - 88	DA-TP-15	8100	NA	2100 ca	7800	YES	ASL
BENZO(A)PYRENE	9/15	120 J	4800	82 - 96	DA-TP-15	1217	NA	210 ca	800	YES	ASL
BENZO(B)FLUORANTHENE	10/15	140 J	4500	100 - 110	DA-TP-15	3941	NA	2100 ca	7800	YES	ASL
BENZO(G,H,I)PERYLENE	8/15	330 J	2400	120 - 140	DA-TP-15	710	NA	2900000 nc	10000000	NO	BSL
BENZO(K)FLUORANTHENE	10/15	130 J	4600	77 - 86	DA-TP-15	4600	NA	21000 ca	78000	NO	BSL
BENZOIC ACID	5/15	1100 J	5900 J	220 - 1400	DA-TP-09	1660	NA	100000000 max	---	NO	BSL
BIS(2-ETHYLHEXYL)PHTHALATE	7/15	420 J	560 J	110 - 660	DA-TP-01	361	NA	120000 ca*	410000	NO	BSL
CARBAZOLE	7/15	160 J	2800	76 - 90	DA-TP-15	642	NA	86000 ca	---	NO	BSL
CHRYSENE	11/15	120 J	7900	81 - 91	DA-TP-15	7900	NA	210000 ca	780000	NO	BSL
DIBENZO(A,H)ANTHRACENE	2/15	290 J	1000	140 - 840	DA-TP-15	277	NA	210 ca	800	YES	ASL
DIBENZOFURAN	1/15	670	670	120 - 710	DA-TP-15	192	NA	310000 nc	---	NO	BSL
FLUORANTHENE	11/15	230 J	21000	66 - 74	DA-TP-15	21000	NA	2200000 nc	10000000	NO	BSL
FLUORENE	6/15	70 J	1300	66 - 390	DA-TP-15	302	NA	2600000 nc	10000000	NO	BSL
INDENO(1,2,3-CD)PYRENE	7/15	290 J	**2500**	160 - 920	DA-TP-15	675	NA	2100 ca	7800	NO	BSL
NAPHTHALENE, OS	1/15	220 J	220 J	83 - 500	DA-TP-15	97.8	NA	19000 nc	10000000	NO	BSL
PHENANTHRENE	11/15	140 J	15000	66 - 74	DA-TP-15	15000	NA	2900000 nc	10000000	NO	BSL
PYRENE	11/15	200 J	17000	72 - 80	DA-TP-15	17000	NA	2900000 nc	10000000	NO	BSL
TOTAL PAHS	11/15	780	94480	220 - 240	DA-TP-15	94480	NA	---	---	NO	NTX
Pesticides/PCBs (ug/kg)											
4,4'-DDE	1/15	216	216	0.964 - 54	DA-TP-07	88.8	NA	7000 ca	---	NO	BSL
4,4'-DDT	1/15	184 J	184 J	1.26 - 108	DA-TP-01	151	NA	7000 ca	---	NO	BSL
ALPHA-CHLORDANE	1/15	235	235	0.575 - 40.5	DA-TP-07	113	NA	6500 ca	---	NO	BSL
TOTAL DDT	2/15	184	216	2.05 - 115	DA-TP-07	216	NA	7000 ca	---	NO	BSL
TOTAL AROCLORS (Aroclors 1254, 1260, 1268)	5/15	94.8	**5220**	21.9 - 26.4	DA-TP-07	941	NA	1000 ca	---	NO	BSL
Metals (mg/kg)											
ALUMINUM	15/15	4600	11000	---	DA-TP-11	9180	NA	---	---	NO	EPA-1
ANTIMONY	4/15	1.2 J	5.5 J	0.22 - 0.74	DA-TP-10	1.3	NA	41 nc	820	NO	BSL
ARSENIC	15/15	3.6 J	90	---	DA-TP-13	29	NA	1.6 ca	3.8	YES	ASL

TABLE 7-2.2 (cont.)
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection	Minimum Concentration[1]	Maximum Concentration[1]	Range of Detection Limits	Location of Maximum Concentration	Concentration Used for Screening[2]	Background Value[3]	Screening Value[4]	Potential ARAR/TBC Value[5]	COPC Flag	COPC Flag Rationale[6]
BARIUM	15/15	10	44	---	DA-TP-02	27.6	NA	6700 nc	10000	NO	BSL
BERYLLIUM	13/15	0.23 J	0.42	0.18 - 0.2	DA-TP-13	0.33	NA	1900 nc	1.3	NO	BSL
CADMIUM	7/15	0.2 J	11	0.018 - 0.24	DA-TP-01	11	NA	45 nc	1000	NO	BSL
CALCIUM	15/15	39	2700 J	---	DA-TP-02	2563	NA	---	---	NO	NUT
CHROMIUM	15/15	4.7 J	64 J	---	DA-TP-10	20.9	NA	64 ca	10000	NO	BSL
COBALT	15/15	3.6	20	---	DA-TP-13	13.4	NA	---	---	NO	EPA-1
COPPER	15/15	8.6	560	---	DA-TP-10	116	NA	---	---	NO	EPA-1
IRON	15/15	9800	30000	---	DA-TP-11	25169	NA	---	---	NO	EPA-1
LEAD	15/15	7.8	160	---	DA-TP-10	67.3	NA	750 nc	500	NO	BSL
MAGNESIUM	15/15	1400	3200 J	---	DA-TP-06	2538	NA	---	---	NO	NUT
MANGANESE	15/15	140	410	---	DA-TP-08, DA-TP-13	320	NA	1900 nc	10000	NO	BSL
MERCURY	13/15	0.009 J	0.14 J	0.00813 - 0.00815	DA-TP-01, DA-TP-07	0.084	NA	31 nc	610	NO	BSL
MOLYBDENUM	2/15	0.44	0.84	0.15 - 0.63	DA-TP-01	0.33	NA	510 nc	---	NO	BSL
NICKEL	15/15	5.2	26	---	DA-TP-13	18.9	NA	2000 nc	10000	NO	BSL
POTASSIUM	15/15	130	820	---	DA-TP-14	303	NA	---	---	NO	NUT
SELENIUM	1/15	0.19 J	0.19 J	0.11 - 0.14	DA-TP-12B	0.083	NA	510 nc	10000	NO	BSL
SILVER	4/15	0.35	2	0.032 - 0.56	DA-TP-01	1.4	NA	510 nc	10000	NO	BSL
VANADIUM	15/15	11	29	---	DA-TP-10	20.9	NA	720 nc	10000	NO	BSL
ZINC	15/15	26 J	280 J	---	DA-TP-10	97.6	NA	10000 nc	10000	NO	BSL

(1) Minimum/maximum detected concentration - field duplicate sample results not averaged. Bolding indicates maximum value is greater than the screening toxicity value.
(2) 95% UCL, or maximum detected concentration if the 95% UCL > maximum detected concentration (also the Reasonable Maximum Exposure (RME)).
(3) NA - No background values available.
(4) Region IX PRG industrial soil November 2002. Region IX PRGs for non-carcinogens have been adjusted by a factor of 0.1 to correspond to an HI of 0.1.
(5) Rhode Island Department of Environmental Management Soil Direct Exposure, Industrial/Commercial.
(6) Rationale Codes: Selection Reason Above Screening Levels (ASL)

Deletion Reas No Screening Toxicity Value (NTX)
Below Screening Level (BSL) Essential Nutrient (NUT)
EPA Region I does not advocate quantitative risk evaluation of this contaminant (EPA-1)

Definitions: NA = Not Applicable
COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
J = Estimated Value
ca = Carcinogenic
nc = Non-Carcinogenic
sat = Region IX PRG for non-carcinogen was based on saturation. The value shown is the lesser of the saturation or 1/10 of the original Region IX PRG.
ca* = where nc < 100 x ca
max = Region IX PRG for this non-carcinogen was based on a ceiling limit. The value shown is the lesser of the ceiling limit or 1/10 of the original Region IX PRG.

TABLE 7-2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Scenario Timeframe: Future
Exposure Medium: Soil (0 - 15 feet)
Exposure Point: NUSC Disposal Area

Parameter	Frequency of Detection	Minimum Concentration[1]	Maximum Concentration[1]	Range of Detection Limits	Location of Maximum Detection	Concentration Used for Screening[2]	Background Value[3]	Screening Value[4]	Potential ARAR/TBC Value[5]	COPC Flag	COPC Flag Rationale[6]
Volatile Organics (ug/kg)											
1,2,4-TRIMETHYLBENZENE	7/65	1.1 J	17000	0.19 - 8300	DA-SB-04	817	NA	17000 nc	---	NO	BSL
1,3,5-TRIMETHYLBENZENE	2/65	120 J	860 J	0.16 - 8800	DA-TP-01	213	NA	7000 nc	---	NO	BSL
2-BUTANONE	10/65	1.8 J	23	0.24 - 54000	DA-SB-01	23	NA	2700000 nc	10000000	NO	BSL
4-ISOPROPYLTOLUENE	7/65	2.5	6400	0.2 - 11000	DA-SB-04	417	NA	---	---	NO	NTX
ACETONE	16/65	8.5	140 J	4 - 48000	DA-SB-05	140	NA	600000 nc	10000000	NO	BSL
CARBON DISULFIDE	5/65	0.93 J	2.4 J	0.26 - 8900	DA-SB-03	2.4	NA	72000 nc	---	NO	BSL
CHLOROFORM	1/65	0.76 J	0.76 J	0.21 - 4500	DA-SB-01	0.76	NA	12000 nc/ca	940000	NO	BSL
CIS-1,2-DICHLOROETHENE	1/65	1.3	1.3	0.23 - 6000	DA-MW-04B	1.3	NA	15000 nc	---	NO	BSL
ETHYLBENZENE	3/65	0.82	1600	0.21 - 9100	DA-SB-04	232	NA	20000 ca	10000000	NO	BSL
ISOPROPYLBENZENE	3/65	0.58 J	2800	0.23 - 8500	DA-SB-04	256	NA	200000 ca	---	NO	BSL
TOTAL XYLENES	12/65	0.61 J	580	0.45 - 12000	DA-TP-01	276	NA	90000 sat	---	NO	BSL
METHYLENE CHLORIDE	2/65	670 J	1300 J	4.2 - 12000	DA-TP-02	296	NA	21000 ca	760000	NO	BSL
N-BUTYLBENZENE	5/65	1.8	8100	0.23 - 13000	DA-SB-04	517	NA	220000 sat	---	NO	BSL
N-PROPYLBENZENE	3/65	170 J	6100	0.21 - 10000	DA-SB-04	385	NA	220000 sat	---	NO	BSL
SEC-BUTYLBENZENE	9/65	0.97	4700	0.2 - 13000	DA-SB-04	401	NA	160000 sat	---	NO	BSL
TERT-BUTYLBENZENE	6/65	0.54 J	2.6 J	0.21 - 9400	DA-SB-05	2.6	NA	200000 sat	---	NO	BSL
TETRACHLOROETHENE	9/65	0.64 J	5.4	0.2 - 14000	DA-TP-07	5.4	NA	3400 ca	110000	NO	BSL
TOLUENE	1/65	90 J	90 J	0.18 - 10000	DA-TP-02	90	NA	220000 sat	10000000	NO	BSL
TRICHLOROETHENE	4/65	1.7	7.8	0.22 - 11000	DA-TP-07	7.8	NA	110 ca	520000	NO	BSL
Semivolatile Organics (ug/kg)											
2,4-DIMETHYLPHENOL	1/64	510 J	510 J	500 - 460000	DA-TP-02	510	NA	1200000 nc	10000000	NO	BSL
2,4-DINITROPHENOL	1/65	310 J	310 J	140 - 120000	DA-TP-14	310	NA	120000 nc	4100000	NO	BSL
2-METHYLNAPHTHALENE	4/65	280 J	**390000** J	210 - 110000	DA-TP-02	18203	NA	19000 nc	10000000	NO	BSL
3,3'-DICHLOROBENZIDINE	2/65	110 J	220 J	98 - 89000	DA-TP-14	220	NA	3800 ca	13000	NO	BSL
4,6-DINITRO-2-METHYLPHENOL	1/65	260 J	260 J	110 - 100000	DA-TP-14	260	NA	---	---	NO	NTX
4-NITROANILINE	1/65	420 J	420 J	180 - 170000	DA-TP-14	420	NA	1800 nc	---	NO	BSL
4-NITROPHENOL	1/65	520 J	520 J	230 - 210000	DA-TP-14	520	NA	700000 nc	---	NO	BSL
ACENAPHTHENE	19/65	73 J	1400000	64 - 3000	DA-TP-02	73012	NA	2900000 nc	10000000	NO	BSL
ACENAPHTHYLENE	4/65	94 J	3500 J	84 - 76000	DA-TP-08	2708	NA	2900000 nc	10000000	NO	BSL
ANTHRACENE	29/65	44 J	1300000	42 - 3000	DA-TP-02	93338	NA	100000000 nc	10000000	NO	BSL
BENZO(A)ANTHRACENE	36/65	90 J	1900000	77 - 2700	DA-TP-15A	157035	NA	2100 ca	7800	YES	ASL
BENZO(A)PYRENE	31/65	89 J	1500000	79 - 3000	DA-TP-15A	126318	NA	210 ca	800	YES	ASL
BENZO(B)FLUORANTHENE	33/65	120 J	1300000	99 - 3000	DA-TP-15A	107215	NA	2100 ca	7800	YES	ASL
BENZO(G,H,I)PERYLENE	27/65	120 J	830000	110 - 3000	DA-TP-15A	70728	NA	2900000 nc	10000000	NO	BSL
BENZO(K)FLUORANTHENE	34/65	86 J	1200000	74 - 3000	DA-TP-15A	101788	NA	21000 ca	78000	YES	ASL
BENZOIC ACID	9/65	880 J	5900 J	220 - 200000	DA-TP-09	5900	NA	100000000 max	---	NO	BSL
BIS(2-ETHYLHEXYL)PHTHALATE	26/65	400 J	1000 J	110 - 98000	DA-TP-14	1000	NA	120000 ca*	410000	NO	BSL
CARBAZOLE	22/65	92 J	**770000**	73 - 3000	DA-TP-02	52246	NA	86000 ca	---	NO	BSL
CHRYSENE	36/65	120 J	**1700000**	79 - 2700	DA-TP-15A	140053	NA	210000 ca	780000	NO	BSL
DI-N-BUTYL PHTHALATE	1/65	120 J	120 J	74 - 67000	DA-MW-04B	120	NA	6200000 nc	---	NO	BSL
DIBENZO(A,H)ANTHRACENE	12/65	230 J	330000	140 - 3600	DA-TP-15A	24995	NA	210 ca	800	YES	ASL
DIBENZOFURAN	11/65	230 J	**620000**	120 - 3000	DA-TP-02	34426	NA	310000 nc	---	NO	BSL
DIETHYL PHTHALATE	2/65	180 J	**150000** J	66 - 36000	DA-TP-02	6990	NA	49000000 max	10000000	NO	BSL
FLUORANTHENE	37/65	140 J	**4600000**	64 - 2700	DA-TP-15A	390061	NA	2200000 nc	10000000	NO	BSL
FLUORENE	20/65	70 J	920000	63 - 3000	DA-TP-02	55822	NA	2600000 nc	10000000	NO	BSL
INDENO(1,2,3-CD)PYRENE	23/65	200 J	850000	150 - 4300	DA-TP-15A	72331	NA	2100 ca	7800	YES	ASL
NAPHTHALENE, OS	13/65	100 J	1900000	81 - 3000	DA-TP-02	83855	NA	19000 nc	10000000	YES	ASL
PENTACHLOROPHENOL	1/65	410 J	410 J	380 - 340000	DA-TP-06	410	NA	9000 ca	48000	NO	BSL
PHENANTHRENE	36/65	73 J	**4700000**	64 - 2700	DA-TP-02	337028	NA	2900000 nc	10000000	NO	BSL

TABLE 7-2.3 (cont.)
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection	Minimum Concentration[1]	Maximum Concentration[1]	Range of Detection Limits	Location of Maximum Detection	Concentration Used for Screening[2]	Background Value[3]	Screening Value[4]	Potential ARAR/TBC Value[5]	COPC Flag	COPC Flag Rationale[6]
PYRENE	37/65	120 J	**3600000**	70 - 2700	DA-TP-02, DA-TP-15A	307661	NA	2900000 nc	10000000	NO	BSL
TOTAL PAHS	39/65	120	27440000	210 - 4300	DA-TP-02	2114015	NA	---	---	NO	NTX
Pesticides PCBs (ug/kg)											
4,4'-DDE	1/65	216	216	0.889 - 244	DA-TP-07	28.9	NA	7000 ca	---	NO	BSL
4,4'-DDT	5/65	171 J	347 J	1.24 - 386	DA-TP-07	57.6	NA	7000 ca	---	NO	BSL
ALPHA-CHLORDANE	1/65	235	235	0.562 - 144	DA-TP-07	21.8	NA	6500 ca	---	NO	BSL
TOTAL DDT	6/65	171	347	1.89 - 410	DA-TP-07	63	NA	7000 ca	---	NO	BSL
TOTAL AROCLORS (Aroclors 1248,	14/65	27.4	**5220**	21.7 - 390	DA-TP-07	308	NA	1000 ca	---	NO	BSL
TOXAPHENE	1/65	45.9 J	45.9 J	42.7 - 9730	DA-SB-02	45.9	NA	1600 ca	---	NO	BSL
Metals (mg/kg)											
ALUMINUM	65/65	37 J	17000	---	DA-TP-11, DA-TP-15A	8967	NA	---	---	NO	EPA-1
ANTIMONY	8/65	0.26	6.2	0.08 - 1.6	DA-TP-07	0.62	NA	41 nc	820	NO	BSL
ARSENIC	65/65	0.19 J	90	---	DA-TP-13	21.6	NA	1.6 ca	3.8	YES	ASL
BARIUM	64/65	6.9	120	0.18	DA-TP-15A, DA-TP-15A	26.4	NA	6700 nc	10000	NO	BSL
BERYLLIUM	61/65	0.23 J	2.5	0.024 - 0.27	DA-TP-15A	0.47	NA	1900 nc	1.3	NO	BSL
CADMIUM	23/65	0.16 J	11	0.016 - 0.24	DA-TP-01	0.85	NA	45 nc	1000	NO	BSL
CALCIUM	64/65	39	53000 J	13	DA-TP-15A	4209	NA	---	---	NO	NUT
CHROMIUM	65/65	0.24 J	64 J	---	DA-TP-10	13.2	NA	64 ca	10000	NO	BSL
COBALT	65/65	0.36	34	---	DA-SB-03	13.3	NA	---	---	NO	EPA-1
COPPER	65/65	0.64	2600	---	DA-TP-07	135	NA	---	---	NO	EPA-1
IRON	65/65	920 J	67000	---	DA-SB-03	25705	NA	---	---	NO	EPA-1
LEAD	65/65	1.8	**830**	---	DA-TP-14	64	NA	750 nc	500	NO	BSL
MAGNESIUM	65/65	21 J	24000	---	DA-TP-15A	3690	NA	---	---	NO	NUT
MANGANESE	65/65	4.6	**3300**	---	DA-SB-03	564	NA	1900 nc	10000	NO	BSL
MERCURY	47/65	0.00808	0.14 J	0.007 - 0.00893	DA-TP-01, DA-TP-07	0.042	NA	31 nc	610	NO	BSL
MOLYBDENUM	11/65	0.42	1	0.052 - 0.7	DA-TP-07, DA-TP-11	0.3	NA	510 nc	---	NO	BSL
NICKEL	65/65	0.39	27	---	DA-TP-05	18.2	NA	2000 nc	10000	NO	BSL
POTASSIUM	63/65	81	3400	4 - 92	DA-TP-15A	393	NA	---	---	NO	NUT
SELENIUM	3/65	0.19 J	0.36 J	0.099 - 0.59	DA-TP-15A	0.1	NA	510 nc	10000	NO	BSL
SILVER	17/65	0.034 J	2.5	0.028 - 0.56	DA-TP-07, DA-TP-14	0.33	NA	510 nc	10000	NO	BSL
SODIUM	4/65	47	1500	5.2 - 75	DA-TP-15A	110	NA	---	---	NO	NUT
THALLIUM	9/65	0.17 J	0.89 J	0.14 - 0.97	DA-TP-05	0.38	NA	6.7 nc	140	NO	BSL
VANADIUM	64/65	8.2	40	0.099	DA-SB-03	16.7	NA	720 nc	10000	NO	BSL
ZINC	65/65	2.2 J	1200	---	DA-TP-07	101	NA	10000 nc	10000	NO	BSL

(1) Minimum/maximum detected concentration - field duplicate sample results not averaged. Bolding indicates maximum value is greater than the screening toxicity value.
(2) 95% UCL, or maximum detected concentration if the 95% UCL > maximum detected concentration (also the Reasonable Maximum Exposure (RME)).
(3) NA - No background values available.
(4) Region IX PRG industrial soil November 2002. Region IX PRGs for non-carcinogens have been adjusted by a factor of 0.1 to correspond to an HI of 0.1.
(5) Rhode Island Department of Environmental Management Soil Direct Exposure, Industrial/Commercial.
(6) Rationale Codes: Selection Reason:

Deletion Reasor No Screening Toxicity Value (NTX)
Below Screening Level (BSL) Essential Nutrient (NUT)
EPA Region I does not advocate quantitative risk evaluation of this contaminant (EPA-1)

Definitions NA = Not Applicable
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
J = Estimated Value
ca = Carcinogenic
nc = Non-Carcinogenic
sat = Region IX PRG for non-carcinogen was based on saturation. The value shown is the lesser of the saturation or 1/10 of the original Region IX PRG.
ca* = where nc < 100 x ca
max = Region IX PRG for this non-carcinogen was based on a ceiling limit. The value shown is the lesser of the ceiling limit or 1/10 of the original Region IX PRG.

TABLE 7-2.4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Scenario Timeframe: Future
Exposure Medium: Groundwater
Exposure Point: NUSC Disposal Area

Parameter	Frequency of Detection	Minimum Concentration[1]	Maximum Concentration[1]	Range of Detection Limits	Location of Maximum Detection	Concentration Used for Screening[2]	Background Value[3]	Screening Value[4]	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	COPC Flag Rationale[5]
Volatile Organics (ug/L)												
1,1,1-TRICHLOROETHANE	1/4	0.46 J	0.46 J	0.25-6.2	DA-MW-04B	0.46	NA	200 nc	200	RIDEM	NO	BSL
1,1-DICHLOROETHANE	1/4	49	49	0.19-4.7	DA-MW-04B	49	NA	81.0* nc	---	---	NO	BSL
CIS-1,2-DICHLOROETHENE	3/4	0.61	6.4	4.6	DA-MW-04B	6.4	NA	70 nc	70	RIDEM	NO	BSL
ISOPROPYLBENZENE	1/4	0.33 J	0.33 J	0.26-6.5	DA-MW-02B	0.33	NA	200 nc	---	---	NO	BSL
SEC-BUTYLBENZENE	1/4	3.3	3.3	0.4-10	DA-MW-02B	3.3	NA	24.0* nc	---	---	NO	BSL
TERT-BUTYLBENZENE	1/4	0.97 J	0.97 J	0.29-7.2	DA-MW-02B	0.97	NA	24.0* nc	---	---	NO	BSL
TETRACHLOROETHENE	2/4	1.9	8.4	0.43-11	DA-MW-04B	8.3	NA	5 ca	5	RIDEM	YES	ASL
TRICHLOROETHENE	4/4	0.42 J	1500	0	DA-MW-03B	1500	NA	5 ca	5	RIDEM	YES	ASL
VINYL CHLORIDE	1/4	0.66 J	0.66 J	0.27-6.8	DA-MW-04B	0.66	NA	2 ca	2	RIDEM	NO	BSL
Total Metals (ug/L)												
ALUMINUM	4/4	21 J	97	0	DA-MW-01B	77	NA	---	---	---	NO	EPA-1
ARSENIC	1/4	26.1	26.1	3.4	DA-MW-02B	16.4	NA	10 ca	50	RIDEM	YES	ASL
BARIUM	3/4	9.1	30	1.2	DA-MW-02B	27.3	NA	2000 nc	2000	RIDEM	NO	BSL
CADMIUM	1/4	7.9	10.2	0.4	DA-MW-01B	5.5	NA	5 nc	5	RIDEM	YES	ASL
CALCIUM	4/4	16000	41000	0	DA-MW-04B	41000	NA	---	---	---	NO	NUT
COBALT	1/4	9.6	9.6	0.62-1.9	DA-MW-02B	9.6	NA	---	---	---	NO	EPA-1
COPPER	1/4	1.9 J	1.9 J	1.8	DA-MW-01B	1.2	NA	---	---	---	NO	EPA-1
IRON	2/4	120	27000	14	DA-MW-02B	27000	NA	---	---	---	NO	EPA-1
LEAD	1/4	5.88 J	5.88 J	4.8	DA-MW-01B	3.5	NA	15 nc	15	RIDEM	NO	BSL
MAGNESIUM	4/4	2600	11000	0	DA-MW-04B	11000	NA	---	---	---	NO	NUT
MANGANESE	4/4	81	8400	0	DA-MW-02B	8400	NA	---	50 nc	NSDWS	YES	ASL
MERCURY	1/4	0.24	0.26	0.012	DA-MW-01B	0.15	NA	2 nc	2	RIDEM	NO	BSL
MOLYBDENUM	1/4	1.3 J	1.3 J	1.3-2.1	DA-MW-04B	1.3	NA	18.0* nc	---	---	NO	BSL
NICKEL	1/4	1.82 J	1.82 J	1.8	DA-MW-02B	1.5	NA	---	100 nc	RIDEM	NO	BSL
POTASSIUM	3/4	1500	2300	680	DA-MW-02B, DA-MW-03B	2300	NA	---	---	---	NO	NUT
SELENIUM	1/4	2.56 J	2.56 J	2.5	DA-MW-01B	1.6	NA	50 nc	50	RIDEM	NO	BSL
SODIUM	4/4	6100	15000	0	DA-MW-03B	15000	NA	---	---	---	NO	NUT
ZINC	4/4	2.5 J	8.1	0	DA-MW-02B	6.1	NA	---	5000 nc	NSDWS	NO	BSL
Dissolved Metals (ug/L)												
ALUMINUM, FILTERED	3/4	20 J	24 J	17	DA-MW-02B	24	NA	---	---	---	NO	EPA-1
BARIUM, FILTERED	3/4	9 J	630 J	1	DA-MW-01B	395	NA	2000 nc	2000	RIDEM	NO	BSL
CADMIUM, FILTERED	1/4	7.45	9.55	0.4	DA-MW-01B	5.2	NA	5 nc	5	RIDEM	YES	ASL
CALCIUM, FILTERED	4/4	15000	42000	0	DA-MW-04B	42000	NA	---	---	---	NO	NUT
COBALT, FILTERED	1/4	8.6	8.6	0.72-1.5	DA-MW-02B	8.6	NA	---	---	---	NO	EPA-1
COPPER, FILTERED	1/4	2.3 J	2.3 J	1.8	DA-MW-01B	1.3	NA	---	---	---	NO	EPA-1
IRON, FILTERED	1/4	14000	14000	14	DA-MW-02B	8617	NA	---	---	---	NO	EPA-1
MAGNESIUM, FILTERED	4/4	2400	12000	0	DA-MW-04B	12000	NA	---	---	---	NO	NUT

TABLE 7-2.4 (Cont.)
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection	Minimum Concentration[1]	Maximum Concentration[1]	Range of Detection Limits	Location of Maximum Detection	Concentration Used for Screening[2]	Background Value[3]	Screening Value[4]	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	COPC Flag Rationale[5]
MANGANESE, FILTERED	4/4	78	8100	0	DA-MW-02B	8100	NA	---	50 nc	NSDWS	YES	ASL
MERCURY, FILTERED	1/4	0.16	0.18	0.012	DA-MW-01B	0.11	NA	2 nc	2	RIDEM	NO	BSL
NICKEL, FILTERED	1/4	1.93 J	1.93 J	1.8	DA-MW-01B	1.2	NA	---	100 nc	RIDEM	NO	BSL
POTASSIUM, FILTERED	3/4	1300	2300	960	DA-MW-03B	2300	NA	---	---	---	NO	NUT
SODIUM, FILTERED	4/4	5900	16000 J	0	DA-MW-01B	15000	NA	---	---	---	NO	NUT
ZINC, FILTERED	3/4	3.3 J	260 J	2.2	DA-MW-01B	146	NA	---	5000 nc	NSDWS	NO	BSL

(1) Minimum/maximum detected concentration - field duplicate sample results not averaged.
(2) Federal Maximum Contaminant Level (MCL)
NA - No background values available.
(4) Rationale Codes:
(6) Rationale Codes: Selection Reason: Above Screening Levels (ASL)

* MCL does not exist for this contaminant. Value shown is the EPA Region IX PRG for tap water.

Definitions:
RIDEM = Rhode Island Department of Environmental Management GA Groundwater Objectives
NSDWS = National Secondary Drinking Water Standards
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
J = Estimated Value
ca = Carcinogenic
nc = Non-Carcinogenic
sat = Region IX PRG for non-carcinogen was based on saturation. The value shown is the lesser of the saturation or 1/10 of the original Region IX PRG.
ca* = where nc < 100 x ca
max = Region IX PRG for this non-carcinogen was based on a ceiling limit. The value shown is the lesser of the ceiling limit or 1/10 of the original Region IX PRG.

TABLE 7-2.5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Scenario Timeframe: Future
Exposure Medium: Surface water
Exposure Point: NUSC Disposal Area

Parameter	Frequency of Detection	Minimum Concentration[1]	Maximum Concentration[1]	Range of Detection Limits	Location of Maximum Detection	Concentration Used for Screening[2]	Background Value[3]	Screening Value[4]	Potential ARAR/TBC value	Potential ARAR/TBC Source	COPC Flag	COPC Flag Rationale[5]
Volatile Organics (ug/L)												
1,1,1-TRICHLOROETHANE	4/9	0.92 J	2.4 J	0.25	DA-SW/SD-02	1.2	NA	200 nc	200	RIDEM	NO	BSL
1,1-DICHLOROETHANE	4/9	0.7 J	1.6 J	0.19	DA-SW/SD-02	0.86	NA	81.0* nc	---	---	NO	BSL
Semivolatile Organics (ug/L)							NA					
BIS(2-ETHYLHEXYL)PHTHALATE	7/9	3.6 J	5 J	3.8	DA-SW/SD-09	4	NA	6 ca	---	---	NO	BSL
Pesticides PCBs (ug/L)												
4,4'-DDE	1/9	0.0138 J	0.014 J	0.003 - 0.006	DA-SW/SD-02	0.006	NA	0.20* ca	---	---	NO	BSL
4,4'-DDT	1/9	0.0348 J	0.0348 J	0.002 - 0.004	DA-SW/SD-02	0.006	NA	0.20* ca	---	---	NO	BSL
DIELDRIN	4/9	0.013 J	0.0299 J	0.003 - 0.006	DA-SW/SD-02	0.022	NA	0.004* ca	---	---	YES	ASL
Total Metals (ug/L)												
ALUMINUM	4/9	36 J	350	27 - 130	DA-SW/SD-03	278	NA	---	---	---	NO	EPA-1
ARSENIC	6/9	1.67 J	3.8	1.6	DA-SW/SD-08	2.6	NA	10 ca	50	RIDEM	NO	BSL
BARIUM	9/9	3.7	12	---	DA-SW/SD-09	9.7	NA	2000 nc	2000	RIDEM	NO	BSL
CALCIUM	9/9	20000	37000	---	DA-SW/SD-02	32237	NA	---	---	---	NO	NUT
CHROMIUM	2/9	1.2 J	1.3 J	1.2	DA-SW/SD-08	0.89	NA	100 ca	100	RIDEM	NO	BSL
COBALT	6/9	1.2 J	2.9	1	DA-SW/SD-09	2.2	NA	---	---	---	NO	EPA-1
COPPER	4/9	2.5 J	3.2 J	2.5	DA-SW/SD-06	2.4	NA	---	---	---	NO	EPA-1
IRON	9/9	120	970	---	DA-SW/SD-09	970	NA	---	---	---	NO	EPA-1
LEAD	1/9	11.3	11.3	0.8 - 4.18	DA-SW/SD-03	6.9	NA	15 nc	15	RIDEM	NO	BSL
MAGNESIUM	9/9	5200	9200	---	DA-SW/SD-01	8260	NA	---	---	---	NO	NUT
MANGANESE	9/9	15	600	---	DA-SW/SD-09	600	NA	---	50 nc	NSDWS	YES	ASL
MERCURY	5/9	0.012 J	0.018 J	0.012	DA-SW/SD-03	0.013	NA	2 nc	2	RIDEM	NO	BSL
MOLYBDENUM	8/9	20	81	1.9	DA-SW/SD-03	62	NA	18.0* nc	---	---	YES	ASL
NICKEL	8/9	2.41 J	3.87 J	2.1	DA-SW/SD-09	3.3	NA	---	100 nc	RIDEM	NO	BSL
POTASSIUM	9/9	2800	4900	---	DA-SW/SD-06	4541	NA	---	---	---	NO	NUT
SODIUM	9/9	14000 J	49000	---	DA-SW/SD-02	43051	NA	---	---	---	NO	NUT
THALLIUM	1/9	3.53 J	3.53 J	3.2 - 4.11	DA-SW/SD-04	2.2	NA	2 nc	2	RIDEM	YES	ASL
ZINC	4/9	4.8 J	8.5 J	4.6	DA-SW/SD-03	5.3	NA	---	5000 nc	NSDWS	NO	BSL
Dissolved Metals (ug/L)												
ALUMINUM, FILTERED	4/9	37 J	370	23 - 120	DA-SW/SD-03	294	NA	---	---	---	NO	EPA-1
ARSENIC, FILTERED	3/9	2.43 J	3.04 J	1.6	DA-SW/SD-09	2	NA	10 ca	50	RIDEM	NO	BSL
BARIUM, FILTERED	9/9	3.4	12	---	DA-SW/SD-09	9.2	NA	2000 nc	2000	RIDEM	NO	BSL
CALCIUM, FILTERED	9/9	19000	36000	---	DA-SW/SD-02	31750	NA	---	---	---	NO	NUT
CHROMIUM, FILTERED	2/9	1.2 J	1.2 J	1.2	DA-SW/SD-03, DA-SW/SD-09	0.87	NA	100 ca	100	RIDEM	NO	BSL
COBALT, FILTERED	6/9	1 J	2.8	1	DA-SW/SD-09	2.1	NA	---	---	---	NO	EPA-1
COPPER, FILTERED	4/9	2.6 J	4.2 J	2.5	DA-SW/SD-01	2.6	NA	---	---	---	NO	EPA-1
IRON, FILTERED	9/9	130	980	---	DA-SW/SD-09	980	NA	---	---	---	NO	EPA-1
LEAD, FILTERED	1/9	12.4	12.4	0.8 - 3.82	DA-SW/SD-03	4.2	NA	15 nc	15	RIDEM	NO	BSL
MAGNESIUM, FILTERED	9/9	5200	9300	---	DA-SW/SD-01	8154	NA	---	---	---	NO	NUT
MANGANESE, FILTERED	9/9	15	670	---	DA-SW/SD-09	670	NA	---	50 nc	NSDWS	YES	ASL
MERCURY, FILTERED	5/9	0.012 J	0.016 J	0.012	DA-SW/SD-08, DA-SW/SD-09	0.012	NA	2 nc	2	RIDEM	NO	BSL
MOLYBDENUM, FILTERED	8/9	19	78	1.9	DA-SW/SD-03	60	NA	18.0* nc	---	---	YES	ASL
NICKEL, FILTERED	9/9	2.29 J	11.8	---	DA-SW/SD-02	4	NA	---	100 nc	RIDEM	NO	BSL

TABLE 7-2.5 (cont.)
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection	Minimum Concentration[1]	Maximum Concentration[1]	Range of Detection Limits	Location of Maximum Detection	Concentration Used for Screening[2]	Background Value[3]	Screening Value[4]	Potential ARAR/TBC value	Potential ARAR/TBC Source	COPC Flag	COPC Flag Rationale[6]
POTASSIUM, FILTERED	9/9	2600	4600	---	DA-SW/SD-03, DA-SW/SD-06	4471	NA	---	---	---	NO	NUT
SODIUM, FILTERED	9/9	13000	48000	---	DA-SW/SD-02, DA-SW/SD-03	42399	NA	---	---	---	NO	NUT
ZINC, FILTERED	3/9	4.8 J	9.2	4.6	DA-SW/SD-03	5	NA	---	5000 nc	NSDWS	NO	BSL

(1) Minimum/maximum detected concentration - field duplicate sample results not averaged.
(2) Federal Maximum Contaminant Level (MCL).
(3) NA - No background values available.
(4) Rationale Codes:
(6) Rationale Codes: Selection Reason:

* MCL does not exist for this contaminant. Value shown is the EPA Region IX PRG for tap water.

Definitions:

RIDEM = Rhode Island Department of Environmental Management GA Groundwater Objectives
NSDWS = National Secondary Drinking Water Standards
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
J = Estimated Value
ca = Carcinogenic
nc = Non-Carcinogenic
sat = Region IX PRG for non-carcinogen was based on saturation. The value shown is the lesser of the saturation or 1/10 of the original Region IX PRG.
ca* = where nc < 100 x ca
max = Region IX PRG for this non-carcinogen was based on a ceiling limit. The value shown is the lesser of the ceiling limit or 1/10 of the original Region IX PRG.

TABLE 7-3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Exposure Medium: Sediment
Exposure Point: NUSC Disposal Area

				Reasonable Maximum Exposure			Central Tendency Exposure		
Chemical of Potential Concern	Units	Arithmetic Mean	Maximum Detected Concentration	RME EPC Value	RME EPC Statistic	RME Rationale	CTE EPC Value	CTE EPC Statistic	CTE Rationale
ARSENIC	mg/kg	17.3	25.0	21.0	95% UCL-T	W-Test(1)	21.0	95% UCL-T	W-Test(1)
BENZO(A)ANTHRACENE	µg/kg	688	3400	3400	Max	W-Test(2)	688	Max	W-Test(2)
BENZO(A)PYRENE	µg/kg	646	2600	2600	Max	W-Test(2)	646	Max	W-Test(2)
BENZO(B)FLUORANTHENE	µg/kg	696	2300	2300	Max	W-Test(2)	696	Max	W-Test(2)
DIBENZO(A,H)ANTHRACENE	µg/kg	188	640	276	95% UCL-NP	W-Test(4)	276	95% UCL-NP	W-Test(4)
LEAD	mg/kg	331	770	770	Max	W-Test(2)	331	Max	W-Test(2)
MANGANESE	mg/kg	936	2800	2406	95% UCL-T	W-Test(1)	2406	95% UCL-T	W-Test(1)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the average value was used in the calculation.
W-Test: Developed by Shapiro and Wilk, refer to Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive 9285.7-081, May 1992.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); 95% UCL of Non-parametric test data (95% UCL-NP)

(1) Shapiro-Wilk W-Test indicates data are lognormally distributed. 95% UCL was calculated by Land method.
(2) 95% UCL exceeds maximum detected concentration. Therefore, the maximum concentration was used for the RME EPC and the lesser of the mean or maximum detected concentration was used for the CTE.
(3) Shapiro-Wilk W-Test indicates data are normally distributed. 95% UCL was calculated by Student-t method.
(4) Shapiro-Wilk W-Test indicates data are undefined. 95% UCL was calculated by non-parametric Bootstrap method.

TABLE 7-3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Scenario Timeframe: Current
Exposure Medium: Surface Soil (0 - 1 foot)
Exposure Point: NUSC Disposal Area

				Reasonable Maximum Exposure			Central Tendency Exposure		
Chemical of Potential Concern	Units	Arithmetic Mean	Maximum Detected Concentration	RME EPC Value	RME Statistic	RME Rationale	CTE EPC Value	CTE Statistic	CTE Rationale
ARSENIC	mg/kg	20.8	90	29.0	95% UCL-NP	W-Test(4)	29.0	95% UCL-NP	W-Test(4)
BENZO(A)ANTHRACENE	µg/kg	1084	8100	8100	Max	W-Test(2)	1084	Max	W-Test(2)
BENZO(A)PYRENE	µg/kg	721	4800	1217	95% UCL-NP	W-Test(4)	1217	95% UCL-NP	W-Test(4)
BENZO(B)FLUORANTHENE	µg/kg	762	4500	3941	95% UCL-T	W-Test(1)	3941	95% UCL-T	W-Test(1)
DIBENZO(A,H)ANTHRACENE	µg/kg	175	1000	277	95% UCL-N	W-Test(4)	277	95% UCL-N	W-Test(4)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the average value was used in the calculation.
W-Test: Developed by Shapiro and Wilk, refer to Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive 9285.7-081, May 1992.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); 95% UCL of Non-parametric test data (95% UCL-NP)

(1) Shapiro-Wilk W-Test indicates data are lognormally distributed. 95% UCL was calculated by Land method.
(2) 95% UCL exceeds maximum detected concentration. Therefore, the maximum concentration was used for the RME EPC and the lesser of the mean or maximum detected concentration used for the CTE.
(3) Shapiro-Wilk W-Test indicates data are normally distributed. 95% UCL was calculated by Student-t method.
(4) Shapiro-Wilk W-Test indicates data are undefined. 95% UCL was calculated by non-parametric Bootstrap method.

TABLE 7-3.3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Scenario Timeframe: Current/Future
Exposure Medium: Soil (0 - 15 feet)
Exposure Point: NUSC Disposal Area

				Reasonable Maximum Exposure			Central Tendency Exposure		
Chemical of Potential Concern	Units	Arithmetic Mean	Maximum Detected Concentration	RME EPC Value	RME Statistic	RME Rationale	CTE EPC Value	CET Statistic	CTE Rationale
ARSENIC	mg/kg	19.1	90.0	21.6	95% UCL-NP	W-Test(4)	21.6	95% UCL-NP	W-Test(4)
BENZO(A)ANTHRACENE	µg/kg	82413	1900000	157035	95% UCL-NP	W-Test(4)	157035	95% UCL-NP	W-Test(4)
BENZO(A)PYRENE	µg/kg	66409	1500000	126318	95% UCL-NP	W-Test(4)	126318	95% UCL-NP	W-Test(4)
BENZO(B)FLUORANTHENE	µg/kg	57037	1300000	107215	95% UCL-NP	W-Test(4)	107215	95% UCL-NP	W-Test(4)
BENZO(K)FLUORANTHENE	µg/kg	53881	1200000	101788	95% UCL-NP	W-Test(4)	101788	95% UCL-NP	W-Test(4)
DIBENZO(A,H)ANTHRACENE	µg/kg	13041	330000	24995	95% UCL-NP	W-Test(4)	24995	95% UCL-NP	W-Test(4)
INDENO(1,2,3-CD)PYRENE	µg/kg	38183	850000	72331	95% UCL-NP	W-Test(4)	72331	95% UCL-NP	W-Test(4)
NAPHTHALENE	µg/kg	35771	1900000	83855	95% UCL-NP	W-Test(4)	83855	95% UCL-NP	W-Test(4)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the average value was used in the calculation.
W-Test: Developed by Shapiro and Wilk, refer to Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive 9285.7-081, May 1992.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); 95% UCL of Non-parametric test data (95% UCL-NP)

(1) Shapiro-Wilk W-Test indicates data are lognormally distributed. 95% UCL was calculated by Land method.
(2) 95% UCL exceeds maximum detected concentration. Therefore, the maximum concentration was used for the RME EPC and the lesser of the mean or maximum detected concentration was used for the CTE.
(3) Shapiro-Wilk W-Test indicates data are normally distributed. 95% UCL was calculated by Student-t method.
(4) Shapiro-Wilk W-Test indicates data are undefined. 95% UCL was calculated by non-parametric Bootstrap method.

TABLE 7-3.4
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Scenario Timeframe: Future
Exposure Medium: Groundwater
Exposure Point: NUSC Disposal Area

				Reasonable Maximum Exposure			Central Tendency Exposure		
Chemical of Potential Concern	**Units**	**Arithmetic Mean**	**Maximum Detected Concentration**	**RME EPC Value**	**RME Statistic**	**RME Rationale**	**CTE EPC Value**	**CTE Statistic**	**CTE Rationale**
ARSENIC	µg/L	7.8	26.1	16.4	95% UCL-NP	W-Test(4)	16.4	95% UCL-NP	W-Test(4)
CADMIUM	µg/L	2.4125	9.05	5.5	95% UCL-NP	W-Test(4)	5.5	95% UCL-NP	W-Test(4)
MANGANESE	µg/L	2448	8400	8400	Max	W-Test(2)	2448	Max	W-Test(2)
TETRACHLOROETHENE	µg/L	4.1	8.4	8.3	95% UCL-N	W-Test(3)	8.3	95% UCL-N	W-Test(3)
TRICHLOROETHENE	µg/L	376	1500	1500	Max	W-Test(2)	376	Max	W-Test(2)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the average value was used in the calculation.
W-Test: Developed by Shapiro and Wilk, refer to Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive 9285.7-081, May 1992.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); 95% UCL of Non-parametric test data (95% UCL-NP)

(1) Shapiro-Wilk W-Test indicates data are lognormally distributed. 95% UCL was calculated by Land method.
(2) 95% UCL exceeds maximum detected concentration. Therefore, the maximum concentration was used for the RME EPC and the lesser of the mean or maximum detected concentration was used for the CTE.
(3) Shapiro-Wilk W-Test indicates data are normally distributed. 95% UCL was calculated by Student-t method.
(4) Shapiro-Wilk W-Test indicates data are undefined. 95% UCL was calculated by non-parametric Bootstrap method.

TABLE 7-3.5
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
DRAFT STUDY AREA EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Scenario Timeframe: Future
Exposure Medium: Surface water
Exposure Point: NUWC, Newport, RI

				Reasonable Maximum Exposure			Central Tendency Exposure		
Chemical of Potential Concern	Units	Arithmetic Mean	Maximum Detected Concentration	RME EPC Value	RME Statistic	RME Rationale	CTE EPC Value	CTE Statistic	CTE Rationale
DIELDRIN	µg/L	0.009	0.022	0.022	Max	W-Test(2)	0.009	Max	W-Test(2)
MANGANESE	µg/L	215	600	600	Max	W-Test(2)	215	Max	W-Test(2)
MOLYBDENUM	µg/L	43.6	81.0	62.0	95% UCL-N	W-Test(3)	62.0	95% UCL-N	W-Test(3)
THALLIUM	µg/L	1.9	3.53	2.2	95% UCL-NP	W-Test(4)	2.2	95% UCL-NP	W-Test(4)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the average value was used in the calculation.
W-Test: Developed by Shapiro and Wilk, refer to Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive 9285.7-081, May 1992.

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); 95% UCL of Non-parametric test data (95% UCL-NP)

(1) Shapiro-Wilk W-Test indicates data are lognormally distributed. 95% UCL was calculated by Land method.
(2) 95% UCL exceeds maximum detected concentration. Therefore, the maximum concentration was used for the RME EPC and the lesser of the mean or maximum detected concentration was used for the CTE.
(3) Shapiro-Wilk W-Test indicates data are normally distributed. 95% UCL was calculated by Student-t method.
(4) Shapiro-Wilk W-Test indicates data are undefined. 95% UCL was calculated by non-parametric Bootstrap method.

TABLE 8-1
EXPOSURE PARAMETERS FOR THE TERRESTRIAL WILDLIFE MODEL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Species/Exposure Inputs	Conservative Inputs		Average Inputs	
	Values	Units	Values	Units
Bobwhite Quail				
Body Weight = BW	1.54E-01	kg	1.75E-01	kg
Food Ingestion Rate = If	4.88E-03	kg/day	4.08E-03	kg/day
Water Ingestion Rate = Iw	2.28E-02	L/day	1.93E-02	L/day
Soil Ingestion Rate = Is	4.00E-04	kg/day	3.35E-04	kg/day
Meadow Vole				
Body Weight = BW	1.70E-02	kg	3.58E-02	kg
Food Ingestion Rate = If	3.76E-03	kg/day	3.49E-03	kg/day
Water Ingestion Rate = Iw	7.51E-03	L/day	6.26E-03	L/day
Soil Ingestion Rate = Is	9.02E-05	kg/day	8.37E-05	kg/day
American Robin				
Body Weight = BW	7.73E-02	kg	8.04E-02	kg
Food Ingestion Rate = If	1.25E-02	kg/day	1.19E-02	kg/day
Water Ingestion Rate = Iw	1.21E-02	L/day	1.13E-02	L/day
Soil Ingestion Rate - Is	3.74E-04	kg/day	1.78E-04	kg/day
Short-Tailed Shrew				
Body Weight = BW	1.50E-02	kg	1.61E-02	kg
Food Ingestion Rate = If	1.60E-03	kg/day	1.43E-03	kg/day
Water Ingestion Rate = Iw	4.28E-03	L/day	3.60E-03	L/day
Soil Ingestion Rate - Is	4.80E-05	kg/day	2.15E-05	kg/day
Great Blue Heron				
Body Weight = BW	2.20E+00	kg	2.31E+00	kg
Food Ingestion Rate = If	1.16E-01	kg/day	1.04E-01	kg/day
Water Ingestion Rate = Iw	1.16E-01	L/day	1.04E-01	L/day
Sediment Ingestion Rate - Is	3.82E-03	kg/day	3.43E-03	kg/day
Raccoon				
Body Weight = BW	3.67E+00	kg	5.64E+00	kg
Food Ingestion Rate = If	2.37E-01	kg/day	1.84E-01	kg/day
Water Ingestion Rate = Iw	4.68E-01	L/day	4.65E-01	L/day
Sediment Ingestion Rate - Is	2.23E-02	kg/day	1.73E-02	kg/day

Notes:
The exposure factors were derived as presented in Appendix G-1.

The soil/sediment ingestion rates were calculated by multiplying the food ingestion rates by the following incidental soil/sediment ingestion rates:

Receptor	Conservative	Average	Source
Bobwhite Quail	8.2%	8.2%	1, 3
Meadow Vole	2.4%	2.4%	2
American Robin	3.0%	1.5%	1, 4
Short-tailed Shrew	3.0%	1.5%	1
Great Blue Heron	3.3%	3.3%	2, 5
Raccoon	9.4%	9.4%	2

1 - USEPA (U.S. Environmental Protection Agency), 2000. Ecological Soil Screening Level Guidance, Draft. Office of Emergency and Remedial Response. July.
2 - Beyer, N., E. Connor, and S. Gerould. 1994. Estimates of Soil Ingestion by Wildlife. Journal of Wildlife Management. 58(2). pp. 375-382.
3 - Based on a Canada Goose
4 - Based on a Short-tailed Shrew
5 - Based on a Mallard Duck

TABLE 8-2
SUMMARY OF DESCRIPTIVE STATISTICS FOR ECOLOGICAL RISK ASSESSMENT - SURFACE SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection[1]	Minimum Concentration[1]	Maximum Concentration[1,2]	Range of Nondetects	Mean Concentration [3]	Sample of Maximum Concentration	Ecological Risk Screening				
							Screening Level[4]	Ecological Effects Quotient (unitless)[8]	Selected as a COPC? (Y/N)	Further Evaluated In Terrestrial Food Chain Modeling?	Rationale
Volatile Organics (ug/kg)											
1,2,4-TRIMETHYLBENZENE	3/15	1.2 J	1600	0.23 - 0.39	110	DA-S-TP01-0001-01	---	---	Y	N	NTX
1,3,5-TRIMETHYLBENZENE	1/15	860 J	860 J	0.19 - 0.33	57	DA-S-TP01-0001-01	---	---	Y	N	NTX
2-BUTANONE	1/15	2.8 J	2.8 J	0.29 - 660	22	DA-S-TP09-0001-01	---	---	Y	N	NTX
4-ISOPROPYLTOLUENE	1/15	260	260	0.24 - 0.41	17	DA-S-TP01-0001-01	---	---	Y	N	NTX
ACETONE	2/15	9.9	66 J	4.7 - 590	27	DA-S-TP09-0001-01	---	---	Y	N	NTX
M+P-XYLENES	3/15	0.79 J	350	0.53 - 0.92	24	DA-S-TP01-0001-01	1000	0.4	N	N	BSL
N-BUTYLBENZENE	1/15	260	260	0.27 - 0.47	18	DA-S-TP01-0001-01	---	---	Y	N	NTX
N-PROPYLBENZENE	1/15	300	300	0.25 - 0.42	20	DA-S-TP01-0001-01	---	---	Y	N	NTX
NAPHTHALENE	1/15	780 J	780 J	3.6 - 6.2	54	DA-S-TP01-0001-01	600	1.3	Y	N	NTX
O-XYLENE	1/15	230	230	0.43 - 0.74	16	DA-S-TP01-0001-01	1000	0.2	N	N	BSL
Semivolatile Organics (ug/kg)											
3,3'-DICHLOROBENZIDINE	1/15	110 J	110 J	100 - 600	73	DA-S-TP12-0001-01	---	---	Y	N	NTX
ACENAPHTHENE	5/15	110 J	960	66 - 390	140	DA-S-TP15-0001-01	20000	0.05	N	Y	BIO
ACENAPHTHYLENE	1/15	290 J	290 J	85 - 510	76	DA-S-TP12A-0001-01	700 [5]	0.4	N	Y	BIO
ANTHRACENE	9/15	52 J	3200	44 - 51	420	DA-S-TP15-0001-01	700 [5]	4.6	Y	Y	ASL, BIO
BENZO(A)ANTHRACENE	11/15	90 J	8100	79 - 88	1100	DA-S-TP15-0001-01	700 [5]	12	Y	Y	ASL, BIO
BENZO(A)PYRENE	9/15	120 J	4800	82 - 96	720	DA-S-TP15-0001-01	700	6.9	Y	Y	ASL, BIO
BENZO(B)FLUORANTHENE	10/15	140 J	4500	100 - 110	760	DA-S-TP15-0001-01	700 [5]	6.4	Y	Y	ASL, BIO
BENZO(G,H,I)PERYLENE	8/15	330 J	2400	120 - 140	450	DA-S-TP15-0001-01	700 [5]	3.4	Y	Y	ASL, BIO
BENZO(K)FLUORANTHENE	10/15	130 J	4600	77 - 86	730	DA-S-TP15-0001-01	700 [5]	6.6	Y	Y	ASL, BIO
BENZOIC ACID	5/15	1100 J	5900 J	220 - 1400	1000	DA-S-TP09-0001-01	---	---	Y	N	NTX
BIS(2-ETHYLHEXYL)PHTHALATE	7/15	420 J	560 J	110 - 660	270	DA-S-TP01-0001-01	100000	0.006	N	N	BSL
CARBAZOLE	7/15	160 J	2800	76 - 90	350	DA-S-TP15-0001-01	---	---	Y	N	NTX
CHRYSENE	11/15	120 J	7900	81 - 91	1100	DA-S-TP15-0001-01	700 [5]	11	Y	Y	ASL, BIO
DIBENZO(A,H)ANTHRACENE	2/15	290 J	1000	140 - 840	180	DA-S-TP15-0001-01	700 [5]	1.4	Y	Y	ASL, BIO
DIBENZOFURAN	1/15	670	670	120 - 710	120	DA-S-TP15-0001-01	---	---	Y	N	NTX
FLUORANTHENE	11/15	230 J	21000	66 - 74	2600	DA-S-TP15-0001-01	700 [5]	30	Y	Y	ASL, BIO
FLUORENE	6/15	70 J	1300	66 - 390	170	DA-S-TP15-0001-01	30000	0.04	N	Y	BIO
INDENO(1,2,3-CD)PYRENE	7/15	290 J	2500	160 - 920	430	DA-S-TP15-0001-01	700 [5]	3.6	Y	Y	ASL, BIO
NAPHTHALENE, OS	1/15	220 J	220 J	83 - 500	70	DA-S-TP15-0001-01	600	0.4	N	N	BSL
PHENANTHRENE	11/15	140 J	15000	66 - 74	1800	DA-S-TP15-0001-01	700 [5]	21	Y	Y	ASL, BIO
PYRENE	11/15	200 J	17000	72 - 80	2200	DA-S-TP15-0001-01	700 [5]	24	Y	Y	ASL, BIO
TOTAL PAHS	11/15	780	94480	220 - 240	12000	DA-S-TP15-0001-01	1000	94	Y	N	ASL
Pesticides / PCBs (ug/kg)											
4,4'-DDE	1/15	216	216	0.964 - 54	23	DA-S-TP07-0001-01	10 [6]	22	Y	Y	ASL, BIO
4,4'-DDT	1/15	184 J	184 J	1.26 - 108	28	DA-S-TP01-0001-01	10 [6]	18	Y	Y	ASL, BIO
ALPHA-CHLORDANE	1/15	235	235	0.575 - 40.5	22	DA-S-TP07-0001-01	0.03	7833	Y	Y	ASL, BIO
AROCLOR-1254	2/15	152 J	5220 J	21.9 - 26.4	370	DA-S-TP07-0001-01	40000 [7]	0.1	N	Y	BIO
AROCLOR-1260	3/15	94.8	117	12.4 - 15.3	27	DA-S-TP10-0001-01	40000 [7]	0.003	N	Y	BIO
AROCLOR-1268	1/15	134	134	21.9 - 26.4	20	DA-S-TP01-0001-01	40000 [7]	0.003	N	Y	BIO
TOTAL DDT	2/15	184	216	2.05 - 115	41	DA-S-TP07-0001-01	10	22	Y	Y	ASL, BIO
TOTAL PCBs	5/15	94.8	5220	21.9 - 26.4	396.7	DA-S-TP07-0001-01	40000	0.1	N	Y	BIO

TABLE 8-2 (cont.)
SUMMARY OF DESCRIPTIVE STATISTICS FOR ECOLOGICAL RISK ASSESSMENT - SURFACE SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection[1]	Minimum Concentration[1]	Maximum Concentration[1,2]	Range of Nondetects	Mean Concentration [3]	Sample of Maximum Concentration	Ecological Risk Screening				
							Screening Level[4]	Ecological Effects Quotient (unitless)[8]	Selected as a COPC? (Y/N)	Further Evaluated in Terrestrial Food Chain Modeling?	Rationale
Metals (mg/kg)											
ALUMINUM	15/15	4600	11000	---	8370	DA-S-TP11-0001-01	50	220	Y	N	ASL
ANTIMONY	4/15	1.2 J	5.5 J	0.22 - 0.74	0.75	DA-S-TP10-0001-01	78	0.07	N	N	BSL
ARSENIC	15/15	3.6 J	90	---	20.8	DA-S-TP13-0001-01	10	9	Y	Y	ASL, BIO
BARIUM	15/15	10	44	---	21.6	DA-S-TP02-0001-01	330	0.1	N	N	BSL
BERYLLIUM	13/15	0.23 J	0.42	0.18 - 0.2	0.29	DA-S-TP13-0001-01	40	0.01	N	N	BSL
CADMIUM	7/15	0.2 J	11	0.018 - 0.24	0.95	DA-S-TP01-0001-01	32	0.3	N	Y	BIO
CALCIUM	15/15	39	2700 J	---	875	DA-S-TP02-0001-01	---	---	N	N	NUT
CHROMIUM	15/15	4.7 J	64 J	---	14.9	DA-S-TP10-0001-01	0.4	160	Y	Y	ASL, BIO
COBALT	15/15	3.6	20	---	10.5	DA-S-TP13-0001-01	13	1.5	Y	N	ASL
COPPER	15/15	8.6	560	---	57.6	DA-S-TP10-0001-01	50	11	Y	Y	ASL, BIO
IRON	15/15	9800	30000	---	22700	DA-S-TP11-0001-01	---	---	Y	N	NTX
LEAD	15/15	7.8	160	---	39.0	DA-S-TP10-0001-01	115	1.4	Y	Y	ASL, BIO
MAGNESIUM	15/15	1400	3200 J	---	2330	DA-S-TP06-0001-01	---	---	N	N	NUT
MANGANESE	15/15	140	410	---	282	DA-S-TP13-0001-01	500	0.8	N	N	BSL
MERCURY	13/15	0.009 J	0.14 J	0.00813 - 0.00815	0.062	DA-S-TP07-0001-01	0.1	1.4	Y	Y	ASL, BIO
MOLYBDENUM	2/15	0.44	0.84	0.15 - 0.63	0.24	DA-S-TP01-0001-01	3	0.3	N	N	BSL
NICKEL	15/15	5.2	26	---	16.7	DA-S-TP13-0001-01	30	0.9	N	Y	BIO
POTASSIUM	15/15	130	820	---	233	DA-S-TP14-0001-01	---	---	N	N	NUT
SELENIUM	1/15	0.19 J	0.19 J	0.11 - 0.14	0.068	DA-S-TP12B-0001-01	1	0.2	N	Y	BIO
SILVER	4/15	0.35	2	0.032 - 0.56	0.28	DA-S-TP01-0001-01	2	1	N	Y	BIO
VANADIUM	15/15	11	29	---	18.0	DA-S-TP10-0001-01	2	15	Y	N	ASL
ZINC	15/15	26 J	280 J	---	72.3	DA-S-TP10-0001-01	50	5.6	Y	Y	ASL, BIO
Miscellaneous Parameters (%)											
TOTAL SOLIDS	15/15	72	89	---	82.0	DA-S-TP02-0001-01	---	---			

TABLE 8-2 (cont.)
SUMMARY OF DESCRIPTIVE STATISTICS FOR ECOLOGICAL RISK ASSESSMENT - SURFACE SOIL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection[1]	Minimum Concentration[1]	Maximum Concentration[1,2]	Range of Nondetects	Mean Concentration [3]	Sample of Maximum Concentration	Ecological Risk Screening				
							Screening Level[4]	Ecological Effects Quotient (unitless)[8]	Selected as a COPC? (Y/N)	Further Evaluated in Terrestrial Food Chain Modeling?	Rationale
Petroleum Hydrocarbons (ug/kg)											
DIESEL RANGE ORGANICS	11/15	11000	430000	17000 - 59000	78900	DA-S-TP07-0001-01	---	---			
GASOLINE RANGE ORGANICS	11/15	470 J	27000	7000 - 8600	3860	DA-S-TP01-0001-01	---	---			

Associated Samples:
DA-S-TP01-0001-01
DA-S-TP02-0001-01
DA-S-TP05-0001-01
DA-S-TP06-0001-01
DA-S-TP07-0001-01
DA-S-TP08-0001-01
DA-S-TP09-0001-01
DA-S-TP10-0001-01
DA-S-TP11-0001-01
DA-S-TP12-0001-01
DA-S-TP12A-0001-01
DA-S-TP12B-0001-01
DA-S-TP13-0001-01
DA-S-TP14-0001-01
DA-S-TP15-0001-01

Abbreviations:
COPC = Chemical of Potential Concern
PCB = Polychlorinated Biphenyl

Notes:
A shaded chemical name indicates that the constituent was selected as a COPC.

Rationale Codes:
For Selection as a COPC or for Further Evaluation:
ASL = Above COPC Screening Level
BIO = Bioaccumulative
NTX = No Toxicity Data Available/Screening Level not Available

For Elimination as a COPC or for Further Evaluation:
BSL = At or Below COPC Screening Level
NUT = Essential Nutrient

Footnotes:
1 - Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations and as one sample when determining the frequency of detection.
2 - The maximum detected concentration is used for screening purposes.
3 - Averages are calculated using half of the detection limit for nondetects.
4 - See Appendix G-2 for sources of screening values.
5 - Benzo(a)pyrene is used as a surrogate for this analyte.
6 - Total DDT value
7 - Total PCB value
8 - Ecological effects quotient = max conc./screening level

TABLE 8-3
SUMMARY OF STATISTICS FOR ECOLOGICAL RISK ASSESSMENT- SEDIMENT
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection[1]	Minimum Concentration [1]	Maximum Concentration [1,2]	Range of Nondetects	Mean Concentration [3]	Sample of Maxmum Detection	Ecological Risk Screening				
							Screening Level[4]	Ecological Effects Quotient (unitless)[8]	Selected as a COPC (Y/N)	Further Evaluated in Terrestrial Food Chain Modeling? (Y/N)	Rationale
Volatile Organics (ug/kg)											
1,1,1-TRICHLOROETHANE	3/9	0.95	2.3	0.36 -1.1	0.7	DA-S-SD02-01	170	0.01	N	N	BSL
1,1-DICHLOROETHANE	1/9	0.71 J	0.71 J	0.32 -1.1	0.4	DA-S-SD02-01	27	0.03	N	N	BSL
1,2,4-TRICHLOROBENZENE	1/9	6.2 J	6.2 J	0.25 -4.6	1	DA-S-SD09-01	9200	0.001	N	N	BSL
2-BUTANONE	4/9	11 J	69 J	0.31 -0.53	15	DA-S-SD07-01	270	0.3	N	N	BSL
4-ISOPROPYLTOLUENE	1/9	0.79 J	0.79 J	0.26 -0.9	0.3	DA-S-SD04-01	---	---	Y	N	NTX
ACETONE	4/9	34 J	180 J	5.2 -8.8	43	DA-S-SD07-01	8.7	21	Y	N	ASL
CARBON DISULFIDE	1/9	2.7 J	2.7 J	0.33 -1.2	0.6	DA-S-SD09-01	0.85	3.2	Y	N	ASL
CHLOROETHANE	1/9	1.6 J	1.6 J	0.23 -0.8	0.4	DA-S-SD01-01	---	---	Y	N	NTX
DICHLORODIFLUOROMETHANE	6/9	2.4 J	66 J	0.42 -1.2	15	DA-S-SD01-01	---	---	Y	N	NTX
M+P-XYLENES	1/9	2.2 J	2.2 J	0.58 -2	0.8	DA-S-SD01-01	25	0.09	N	N	BSL
TETRACHLOROETHENE	1/9	15	15	0.26 -0.91	2	DA-S-SD06-01	530	0.03	N	N	BSL
TOLUENE	1/9	38 J	38 J	0.23 -0.77	4	DA-S-SD07-01	670	0.06	N	N	BSL
TRICHLOROETHENE	1/9	14	14	0.29 -1	2	DA-S-SD06-01	1600	0.01	N	N	BSL
Semivolatile Organics (ug/kg)											
ACENAPHTHENE	1/9	780	780	52 -200	140	DA-S-SD03-01	290	2.7	Y	Y	ASL, BIO
ANTHRACENE	4/9	87 J	2000	53 -140	300	DA-S-SD03-01	57.2	35	Y	Y	ASL, BIO
BENZO(A)ANTHRACENE	6/9	140 J	3400	96 -430	690	DA-S-SD03-01	108	31	Y	Y	ASL, BIO
BENZO(A)PYRENE	5/9	310 J	2600	99 -360	650	DA-S-SD03-01	150	17	Y	Y	ASL, BIO
BENZO(B)FLUORANTHENE	5/9	310 J	2300	120 -320	700	DA-S-SD03-01	1800	1.3	Y	Y	ASL, BIO
BENZO(G,H,I)PERYLENE	5/9	420 J	1900	140 -270	580	DA-S-SD03-01	170	11	Y	Y	ASL, BIO
BENZO(K)FLUORANTHENE	7/9	100 J	2300	93 -310	630	DA-S-SD03-01	240	9.6	Y	Y	ASL, BIO
BENZOIC ACID	8/9	980 J	2700 J	300 -1200	1400	DA-S-SD08-01	---	---	Y	N	NTX
BENZYL ALCOHOL	1/9	400 J	400 J	230 -570	200	DA-S-SD01-01	---	---	Y	N	NTX
BIS(2-ETHYLHEXYL)PHTHALATE	6/9	560 J	2300 J	560 -980	970	DA-S-SD08-01, DA-S-SD09-01	750	3.1	Y	N	ASL
CARBAZOLE	1/9	1300	1300	92 -230	210	DA-S-SD03-01	---	---	Y	N	NTX
CHRYSENE	7/9	140 J	3300	98 -420	870	DA-S-SD03-01	166	20	Y	Y	ASL, BIO
DI-N-BUTYL PHTHALATE	1/9	100 J	100 J	93 -230	74	DA-S-SD03-01	11000	0.01	N	N	BSL
DIBENZO(A,H)ANTHRACENE	1/9	640 J	640 J	170 -430	190	DA-S-SD03-01	33	19	Y	Y	ASL, BIO
DIBENZOFURAN	1/9	550 J	550 J	23 -360	150	DA-S-SD03-01	2000	0.3	N	N	BSL
DIETHYL PHTHALATE	4/9	420 J	2000	83 -530	610	DA-S-SD09-01	630	3.2	Y	N	ASL
FLUORANTHENE	8/9	140 J	8500	80	1900	DA-S-SD03-01	423	20	Y	Y	ASL, BIO
FLUORENE	1/9	1000	1000	60 -200	160	DA-S-SD03-01	77.4	13	Y	Y	ASL, BIO
HMW PAHS[6]	8/9	260	25440	170	5400	DA-S-SD03-01	76.4	333	Y	N	ASL
INDENO(1,2,3-CD)PYRENE	4/9	640 J	1700	190 -270	480	DA-S-SD03-01	200	8.5	Y	Y	ASL, BIO
LMW PAHS[6]	6/9	84	11920	260 -550	1800	DA-S-SD03-01	193	62	Y	N	ASL
NAPHTHALENE, OS	1/9	140 J	140 J	100 -250	84	DA-S-SD03-01	176	0.8	N	N	BSL
PHENANTHRENE	6/9	84 J	8000	80 -550	1300	DA-S-SD03-01	204	39	Y	Y	ASL, BIO
PYRENE	6/9	120 J	7000	87 -2000	1500	DA-S-SD03-01	195	36	Y	Y	ASL, BIO
TOTAL PAHS[7]	8/9	344	37360	260	7100	DA-S-SD03-01	1610	23	Y	N	ASL

TABLE 8-3 (Cont.)
SUMMARY OF STATISTICS FOR ECOLOGICAL RISK ASSESSMENT- SEDIMENT
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection[1]	Minimum Concentration [1]	Maximum Concentration [1,2]	Range of Nondetects	Mean Concentration [3]	Sample of Maxmum Detection	Ecological Risk Screening				
							Screening Level[4]	Ecological Effects Quotient (unitless)[8]	Selected as a COPC (Y/N)	Further Evaluated in Terrestrial Food Chain Modeling? (Y/N)	Rationale
Pesticides/PCBs (ug/kg)											
4,4'-DDE	1/9	13.4 J	13.4 J	7.41 -99	18	DA-S-SD02-01-D	3.16	4.2	Y	Y	ASL, BIO
ALPHA-CHLORDANE	1/9	19.1 J	19.1 J	5.88 -34.5	10	DA-S-SD04-01	3.24	5.9	Y	Y	ASL, BIO
AROCLOR-1260	3/9	100 J	450 J	25.5 -63.2	96	DA-S-SD07-01	5	90	Y	Y	ASL, BIO
AROCLOR-1268	2/9	64.4 J	2480	45.1 -112	310	DA-S-SD07-01	5	496	Y	Y	ASL, BIO
DIELDRIN	3/9	14.4 J	61.3 J	6.48 -40.2	17	DA-S-SD07-01	120	0.5	N	Y	BIO
TOTAL PCBs	3/9	164.4	2930	45.1 -112	390	DA-S-SD07-01	59.8	49	Y	Y	ASL, BIO
Metals (mg/kg)											
ALUMINUM	9/9	5000	20000	---	10200	DA-S-SD09-01	25500	0.8	N	N	BSL
ARSENIC	9/9	11	25	---	17.3	DA-S-SD09-01	9.79	2.6	Y	Y	ASL, BIO
BARIUM	9/9	17	82	---	45.5	DA-S-SD09-01	48	1.7	Y	N	ASL
BERYLLIUM	9/9	0.3	0.75	---	0.46	DA-S-SD09-01	---	---	Y	N	NTX
CADMIUM	9/9	0.17 J	2.4 J	---	1.0	DA-S-SD06-01	0.99	2.4	Y	Y	ASL, BIO
CALCIUM	9/9	710	2700	---	1800	DA-S-SD07-01	---	---	N	N	NUT
CHROMIUM	9/9	6.5	23	---	13.3	DA-S-SD09-01	43.4	0.5	Y	Y	BIO
COBALT	9/9	8.1	180	---	75.2	DA-S-SD02-01-D	50	3.6	Y	N	ASL
COPPER	9/9	9.1	58 J	---	37.7	DA-S-SD08-01	31.6	1.8	Y	Y	ASL, BIO
IRON	9/9	14000	40000 J	---	22900	DA-S-SD08-01	20000	2.0	Y	N	ASL
LEAD	9/9	14	770	---	331	DA-S-SD06-01	35.8	22	Y	Y	ASL, BIO
MAGNESIUM	9/9	1000	3200	---	1900	DA-S-SD09-01	---	---	N	N	NUT
MANGANESE	9/9	200	2800	---	936	DA-S-SD07-01	460	6.1	Y	N	ASL
MERCURY	9/9	0.0639 J	0.33 J	---	0.17	DA-S-SD08-01	0.18	1.8	Y	Y	ASL, BIO
MOLYBDENUM	8/9	3.1	8.8	0.21	4.6	DA-S-SD09-01	---	---	Y	N	NTX
NICKEL	9/9	11	28	---	19.8	DA-S-SD09-01	22.7	1.2	Y	Y	ASL, BIO
POTASSIUM	8/9	150	690	83	285	DA-S-SD09-01	---	---	N	N	NUT
SILVER	9/9	0.16 J	4.8 J	---	1.5	DA-S-SD03-01	4.5	1.1	Y	Y	ASL, BIO
VANADIUM	9/9	12	40	---	23.1	DA-S-SD09-01	57	0.7	N	N	BSL
ZINC	9/9	36	200 J	---	127	DA-S-SD08-01	121	1.7	Y	Y	ASL, BIO
AVS/SEM Parameters (UMO/G)											
ACID VOLATILE SULFIDE, SEM	4/5	0.973 J	23.9 J	0.069	6.0	DA-S-SD09-01	---	---			
CADMIUM, SEM	1/9	0.012	0.012	0.0001 -0.013	0.0043	DA-S-SD06-01	---	---			
CHROMIUM, SEM	9/9	0.03	0.182	---	0.092	DA-S-SD09-01	---	---			
COPPER, SEM	9/9	0.075	0.521	---	0.34	DA-S-SD09-01	---	---			
LEAD, SEM	9/9	0.065	3.48	---	1.5	DA-S-SD06-01	---	---			
MERCURY, SEM	2/9	0.0058	0.0082	0.0061 -0.0144	0.0051	DA-S-SD01-01	---	---			
NICKEL, SEM	9/9	0.054	0.188	---	0.13	DA-S-SD09-01	---	---			
TOTAL SEM-AVS, SEM	9/9	-20.118	5.539	---	0.083	DA-S-SD06-01	---	---			
ZINC, SEM	9/9	0.246	2.15	---	1.4	DA-S-SD07-01	---	---			
Miscellaneous Parameters (%)											
PERCENT CLAY	9/9	2.5	14	---	6.2	DA-S-SD09-01	---	---			
PERCENT COARSE SILT	9/9	5.7	27	---	14.8	DA-S-SD02-01-D	---	---			
PERCENT FINE SILT	9/9	4.8	27	---	12.2	DA-S-SD09-01	---	---			

TABLE 8-3 (Cont.)
SUMMARY OF STATISTICS FOR ECOLOGICAL RISK ASSESSMENT- SEDIMENT
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection[1]	Minimum Concentration [1]	Maximum Concentration [1,2]	Range of Nondetects	Mean Concentration [3]	Sample of Maxmum Detection	Ecological Risk Screening				
							Screening Level[4]	Ecological Effects Quotient (unitless)[8]	Selected as a COPC (Y/N)	Further Evaluated in Terrestrial Food Chain Modeling? (Y/N)	Rationale
PERCENT MEDIUM.SILT	9/9	10	38	---	22.1	DA-S-SD08-01, DA-S-SD09-01	---	---			
PERCENT SAND	9/9	15	68	---	44.6	DA-S-SD04-01	---	---			
SIEVE NO. 004	6/9	0.4	36	0.1	8.6	DA-S-SD04-01	---	---			
SIEVE NO. 010	6/9	0.4	40	0.1	9.6	DA-S-SD04-01	---	---			
SIEVE NO. 040	7/9	0.7	48	0.1	14.5	DA-S-SD04-01	---	---			
SIEVE NO. 100	9/9	0.3 J	58	---	28.5	DA-S-SD03-01	---	---			
TOTAL ORGANIC CARBON	9/9	1.09	5.76 J	---	2.9	DA-S-SD08-01	---	---			
TOTAL SOLIDS	9/9	29 J	72	---	54.3	DA-S-SD04-01	---	---			

Associated Samples
DA-S-SD01-01
DA-S-SD02-01
DA-S-SD02-01-D
DA-S-SD03-01
DA-S-SD04-01
DA-S-SD05-01
DA-S-SD06-01
DA-S-SD07-01
DA-S-SD08-01
DA-S-SD09-01

Abbreviations:
COPC = Chemical of Potential Concern
HMW = High Molecular Weight
LMW = Low Molecular Weight
PAH = Polycyclic Aromatic Hydrocarbons
PCB = Polychlorinated Biphenyl
AVS = Acid Volatile Sulfides
SEM = Simultaneously Extracted Metals

Rationale Codes:
For Selection as a COPC or for Further Evaluation:
ASL = Above COPC Screening Level
BIO = Bioaccumulative
NTX = No Toxicity Data Available/Screening Level not Available

For Elimination as a COPC or for Further Evaluation:
BSL = At or Below COPC Screening Level
NUT = Essential Nutrient

Notes:
A shaded chemical name indicates that the constituent was selected as a COPC.

Footnotes:
1 - Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations and as one sample when determining the frequency of detection.
2 - The maximum detected concentration is used for screening purposes.
3 - Averages are calculated using half of the detection limit for nondetects.
4 - See Appendix G-2 for sources of screening values.
5 - HMW PAHs includes benzo(a)anthracene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene, and pyrene.
6 - LMW PAHs includes acenaphthene, anthracene, fluorene, naphthalene, and phenanthrene.
7 - Total PAHs is the combination of HMW PAHs and LMW PAHs.
8 - Ecological Effects Quotient = Max. conc./screening level

TABLE 8-4
SUMMARY OF STATISTICS FOR ECOLOGICAL RISK ASSESSMENT - SURFACE WATER
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection[1]	Minimum Concentration[1]	Maximum Concentration[1,2]	Range of Nondetects	Mean Concentration[3]	Sample of Maximum Detection	Ecological Risk Screening				Included in Terrestrial Food Chain Model? (Y/N)[5]
							Screening Level[4]	Ecological Effects Quotient (unitless)[6]	Selected as a COPC? (Y/N)	Rationale	
Volatile Organics (ug/L)											
1,1,1-TRICHLOROETHANE	4/9	0.92 J	2.4 J	0.25	0.8	DA-A-SW02-01, DA-A-SW02-01-D	11	0.2	N	BSL	N
1,1-DICHLOROETHANE	4/9	0.7 J	1.6 J	0.19	0.6	DA-A-SW02-01, DA-A-SW02-01-D	47	0.03	N	BSL	N
Semivolatile Organics (ug/L)											
BIS(2-ETHYLHEXYL)PHTHALATE	7/9	3.6 J	5 J	3.8	4	DA-A-SW09-01	3	1.7	Y	ASL	N
Pesticides (ug/L)											
4,4'-DDE	1/9	0.0138 J	0.014 J	0.003 - 0.006	0.0034	DA-A-SW02-01	0.001	14	Y	ASL	Y
4,4'-DDT	1/9	0.0348 J	0.0348 J	0.002 - 0.004	0.0032	DA-A-SW02-01-D	0.001	35	Y	ASL	Y
DIELDRIN	4/9	0.013 J	0.0299 J	0.003 - 0.006	0.0088	DA-A-SW02-01-D	0.056	0.5	N	BSL	Y
Total Metals (ug/L)											
ALUMINUM	4/9	36 J	350	27 - 130	93.9	DA-A-SW03-01	87	4.0	Y	ASL	N
ARSENIC	6/9	1.67 J	3.8	1.6	1.9	DA-A-SW08-01	150	0.03	N	BSL	Y
BARIUM	9/9	3.7	12	---	7.9	DA-A-SW09-01	4	3.0	Y	ASL	N
CALCIUM	9/9	20000	37000	---	28300	DA-A-SW02-01	---	---	N	NUT	N
CHROMIUM	2/9	1.2 J	1.3 J	1.2	0.74	DA-A-SW08-01	11	0.1	N	BSL	Y
COBALT	6/9	1.2 J	2.9	1	1.6	DA-A-SW09-01	23	0.1	N	BSL	N
COPPER	4/9	2.5 J	3.2 J	2.5	1.9	DA-A-SW06-01	9	0.4	N	BSL	Y
IRON	9/9	120	970	---	489	DA-A-SW09-01	1000	1.0	N	BSL	N
LEAD	1/9	11.3	11.3	0.8 - 4.18	2.1	DA-A-SW03-01	2.5	4.5	Y	ASL	Y
MAGNESIUM	9/9	5200	9200	---	7430	DA-A-SW01-01	---	---	N	NUT	N
MANGANESE	9/9	15	600	---	215	DA-A-SW09-01	120	5.0	Y	ASL	N
MERCURY	5/9	0.012 J	0.018 J	0.012	0.01	DA-A-SW03-01	0.77	0.02	N	BSL	Y
MOLYBDENUM	8/9	20	81	1.9	43.6	DA-A-SW03-01	370	0.2	N	BSL	N
NICKEL	8/9	2.41 J	3.87 J	2.1	2.7	DA-A-SW09-01	52	0.07	N	BSL	Y
POTASSIUM	9/9	2800	4900	---	4170	DA-A-SW06-01	---	---	N	NUT	N
SODIUM	9/9	14000 J	49000	---	34700	DA-A-SW02-01	---	---	N	NUT	N
THALLIUM	1/9	3.53 J	3.53 J	3.2 - 4.11	1.9	DA-A-SW04-01	12	0.3	N	BSL	N
ZINC	4/9	4.8 J	8.5 J	4.6	4.1	DA-A-SW03-01	120	0.07	N	BSL	Y
Dissolved Metals (ug/L)											
ALUMINUM, FILTERED	4/9	37 J	370	23 - 120	93.6	DA-A-SW03-01	87	4.3	Y	ASL	N
ARSENIC, FILTERED	3/9	2.43 J	3.04 J	1.6	1.5	DA-A-SW09-01	150	0.02	N	BSL	Y
BARIUM, FILTERED	9/9	3.4	12	---	7.5	DA-A-SW09-01	4	3.0	Y	ASL	N
CALCIUM, FILTERED	9/9	19000	36000	---	27300	DA-A-SW02-01, DA-A-SW02-01-D	---	---	N	NUT	N

TABLE 8-4 (Cont.)
SUMMARY OF STATISTICS FOR ECOLOGICAL RISK ASSESSMENT - SURFACE WATER
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Parameter	Frequency of Detection[1]	Minimum Concentration[1]	Maximum Concentration[1,2]	Range of Nondetects	Mean Concentration[3]	Sample of Maximum Detection	Ecological Risk Screening				Included in Terrestrial Food Chain Model? (Y/N)[5]
							Screening Level[4]	Ecological Effects Quotient (unitless)[6]	Selected as a COPC? (Y/N)	Rationale	
CHROMIUM, FILTERED	2/9	1.2 J	1.2 J	1.2	0.73	DA-A-SW03-01, DA-A-SW09-01	11	0.1	N	BSL	Y
COBALT, FILTERED	6/9	1 J	2.8	1	1.5	DA-A-SW09-01	23	0.1	N	BSL	N
COPPER, FILTERED	4/9	2.6 J	4.2 J	2.5	2.1	DA-A-SW01-01	9	0.5	N	BSL	Y
IRON, FILTERED	9/9	130	980	---	494	DA-A-SW09-01	1000	1.0	N	BSL	N
LEAD, FILTERED	1/9	12.4	12.4	0.8 - 3.82	2.2	DA-A-SW03-01	2.5	5.0	Y	ASL	Y
MAGNESIUM, FILTERED	9/9	5200	9300	---	7180	DA-A-SW01-01	---	---	N	NUT	N
MANGANESE, FILTERED	9/9	15	670	---	223	DA-A-SW09-01	120	5.6	Y	ASL	N
MERCURY, FILTERED	5/9	0.012 J	0.016 J	0.012	0.01	DA-A-SW08-01, DA-A-SW09-01	0.77	0.02	N	BSL	Y
MOLYBDENUM, FILTERED	8/9	19	78	1.9	42.2	DA-A-SW03-01	370	0.2	N	BSL	N
NICKEL, FILTERED	9/9	2.29 J	11.8	---	3.3	DA-A-SW02-01-D	52	0.2	N	BSL	Y
POTASSIUM, FILTERED	9/9	2600	4600	---	4150	DA-A-SW03-01, DA-A-SW06-01	---	---	N	NUT	N
SODIUM, FILTERED	9/9	13000	48000	---	34300	DA-A-SW02-01, DA-A-SW03-01	---	---	N	NUT	N
ZINC, FILTERED	3/9	4.8 J	9.2	4.6	3.7	DA-A-SW03-01	120	0.08	N	BSL	Y

Associated Samples:
DA-A-SW01-01
DA-A-SW02-01
DA-A-SW02-01-D
DA-A-SW03-01
DA-A-SW04-01
DA-A-SW05-01
DA-A-SW06-01
DA-A-SW07-01
DA-A-SW08-01
DA-A-SW09-01

Abbreviations:
COPC = Chemical of Potential Concern

Notes:
A shaded chemical name indicates that the constituent was selected as a COPC.

Rationale Codes:
For Selection as a COPC or for Further Evaluation:
ASL = Above COPC Screening Level
NTX = No Toxicity Data Available/Screening Level not Available

For Elimination as a COPC or for Further Evaluation:
BSL = At or Below COPC Screening Level
NUT = Essential Nutrient

Footnotes:
1 - Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations and as one sample when determining the frequency of detection.
2 - The maximum detected concentration is used for screening purposes.
3 - Averages are calculated using half of the detection limit for nondetects.
4 - See Appendix G-2 for sources of screening values.
5 - Chemicals with a "Y" in this column are included in the conservative food chain model because they are important bioaccumulative chemicals (USEPA, 2000). See Table 8-5 for the results of the conservative food chain model.
6 - Ecological Effects Quotient = Max. Conc./Screening level

TABLE 8-5
TERRESTRIAL FOOD CHAIN MODEL - CONSERVATIVE SCENARIO - INSECTIVOROUS AND HERBIVOROUS RECEPTORS
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC MIDDLETOWN, RHODE ISLAND

Chemical	Herbivorous Receptors				Insectivorous Receptors			
	Bobwhite Quail		Meadow Vole		American Robin		Short-tailed Shrew	
	NOAEL EEQ	LOAEL EEQ	NOAEL EEQ	LOAEL EEQ	NOAEL EEQ	LOAEL EEQ	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics								
ACENAPHTHENE	3.1E-03	3.1E-04	1.7E-03	8.7E-04	5.4E-02	5.4E-03	4.1E-03	2.0E-03
ACENAPHTHYLENE	1.6E-03	1.6E-04	2.7E-04	2.7E-05	1.6E-02	1.6E-03	3.1E-04	3.1E-05
ANTHRACENE	9.7E-03	9.7E-04	9.5E-04	9.5E-05	1.8E-01	1.8E-02	2.4E-03	2.4E-04
BENZO(A)ANTHRACENE	1.3E-02	1.3E-03	4.5E-01	4.5E-02	4.6E-01	4.6E-02	3.6E+00	3.6E-01
BENZO(A)PYRENE	7.1E-03	7.1E-04	3.7E-02	3.7E-03	2.7E-01	2.7E-02	3.6E-01	3.6E-02
BENZO(B)FLUORANTHENE	6.6E-03	6.6E-04	8.7E-03	8.7E-04	2.5E-01	2.5E-02	8.4E-02	8.4E-03
BENZO(G,H,I)PERYLENE	3.3E-03	3.3E-04	2.2E-03	2.2E-04	1.4E-01	1.4E-02	2.5E-02	2.5E-03
BENZO(K)FLUORANTHENE	6.3E-03	6.3E-04	4.0E-03	4.0E-04	2.6E-01	2.6E-02	4.8E-02	4.8E-03
CHRYSENE	1.3E-02	1.3E-03	4.4E-01	4.4E-02	4.5E-01	4.5E-02	3.5E+00	3.5E-01
DIBENZO(A,H)ANTHRACENE	1.4E-03	1.4E-04	4.7E-03	4.7E-04	5.6E-02	5.6E-03	5.6E-02	5.6E-03
FLUORANTHENE	4.6E-02	4.6E-03	2.9E-02	1.5E-02	1.2E+00	1.2E-01	1.3E-01	6.3E-02
FLUORENE	4.0E-03	4.0E-04	3.1E-03	1.5E-03	7.3E-02	7.3E-03	7.8E-03	3.9E-03
INDENO(1,2,3-CD)PYRENE	3.5E-03	3.5E-04	2.3E-03	2.3E-04	1.4E-01	1.4E-02	2.6E-02	2.6E-03
PHENANTHRENE	3.9E-02	3.9E-03	3.5E-01	3.5E-02	8.5E-01	8.5E-02	1.1E+00	1.1E-01
PYRENE	3.7E-02	3.7E-03	4.0E-02	2.4E-02	9.6E-01	9.6E-02	1.7E-01	1.0E-01
Pesticides/PCBs								
4,4'-DDE	7.7E-02	1.3E-02	2.6E-03	5.1E-04	5.0E+01	8.7E+00	3.8E-01	7.5E-02
4,4'-DDT	5.9E-02	1.0E-02	1.6E-03	3.3E-04	4.3E+01	7.4E+00	3.2E-01	6.4E-02
ALPHA-CHLORDANE	3.7E-04	7.4E-05	5.6E-04	2.8E-04	8.9E-02	1.8E-02	2.8E-02	1.4E-02
AROCLOR-1254	8.7E-02	8.7E-03	6.3E-01	6.3E-02	7.5E+01	7.5E+00	1.3E+02	1.3E+01
AROCLOR-1260	1.7E-03	1.7E-04	1.0E-02	1.0E-03	1.7E+00	1.7E-01	2.9E+00	2.9E-01
AROCLOR-1268	2.0E-03	2.0E-04	1.2E-02	1.2E-03	1.9E+00	1.9E-01	3.4E+00	3.4E-01
Metals								
ARSENIC	1.4E+00	4.6E-01	1.8E+02	1.8E+01	3.3E+00	1.1E+00	4.2E+01	4.2E+00
CADMIUM	8.0E-01	5.8E-02	8.0E+00	8.0E-01	5.0E+01	3.6E+00	4.8E+01	4.8E+00
CHROMIUM	3.4E-01	6.7E-02	4.7E-01	1.2E-01	3.3E+01	6.6E+00	6.6E+00	1.7E+00
COPPER	2.7E-01	2.0E-01	6.9E+00	5.3E+00	3.0E+00	2.3E+00	8.0E+00	6.2E+00
LEAD	2.5E+00	2.5E-01	2.2E+00	2.2E-01	3.5E+01	3.5E+00	3.3E+00	3.3E-01
MERCURY	3.5E+00	3.5E-01	4.9E+00	9.7E-01	7.3E+01	7.3E+00	9.6E+00	1.9E+00
NICKEL	1.6E-02	1.2E-02	2.1E-01	1.0E-01	2.6E-01	1.9E-01	3.3E-01	1.7E-01
SELENIUM	4.7E-02	2.3E-02	6.4E-01	3.9E-01	1.1E-01	5.3E-02	1.4E-01	8.4E-02
SILVER	1.4E-03	1.4E-04	1.1E-02	1.1E-03	9.1E-01	9.1E-02	1.4E+00	1.4E-01
ZINC	1.2E+00	1.3E-01	7.1E-01	3.6E-01	4.0E+01	4.5E+00	2.4E+00	1.2E+00

Cells are shaded if the value is greater than 1.0

EEQ - Ecological Effects Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level

TABLE 8-6
TERRESTRIAL FOOD CHAIN MODEL - CONSERVATIVE SCENARIO - PISCIVOROUS RECEPTORS
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Chemical	Piscivorous Receptors			
	Great Blue Heron		Raccoon	
	NOAEL EEQ	LOAEL EEQ	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics				
ACENAPHTHENE	3.0E-02	3.0E-03	4.4E-03	2.2E-03
ANTHRACENE	7.7E-02	7.7E-03	2.0E-03	2.0E-04
BENZO(A)ANTHRACENE	1.3E-01	1.3E-02	2.0E+00	2.0E-01
BENZO(A)PYRENE	1.0E-01	1.0E-02	2.5E-01	2.5E-02
BENZO(B)FLUORANTHENE	8.8E-02	8.8E-03	5.6E-02	5.6E-03
BENZO(G,H,I)PERYLENE	7.3E-02	7.3E-03	2.6E-02	2.6E-03
BENZO(K)FLUORANTHENE	8.8E-02	8.8E-03	3.1E-02	3.1E-03
CHRYSENE	1.3E-01	1.3E-02	1.9E+00	1.9E-01
DIBENZO(A,H)ANTHRACENE	2.5E-02	2.5E-03	4.7E-02	4.7E-03
FLUORANTHENE	3.3E-01	3.3E-02	6.7E-02	3.3E-02
FLUORENE	3.8E-02	3.8E-03	7.8E-03	3.9E-03
INDENO(1,2,3-CD)PYRENE	6.5E-02	6.5E-03	2.3E-02	2.3E-03
PHENANTHRENE	3.1E-01	3.1E-02	7.8E-01	7.8E-02
PYRENE	2.7E-01	2.7E-02	9.1E-02	5.5E-02
Pesticides/PCBs				
4,4'-DDE	3.0E+00	5.1E-01	4.1E-02	8.2E-03
4,4'-DDT	2.0E-04	3.5E-05	5.5E-06	1.1E-06
ALPHA-CHLORDANE	1.1E-02	2.2E-03	6.3E-03	3.2E-03
AROCLOR-1260	1.2E+00	1.2E-01	3.9E+00	3.9E-01
AROCLOR-1268	6.6E+00	6.6E-01	2.2E+01	2.2E+00
DIELDRIN	3.7E-01	3.7E-02	1.8E+00	1.8E-01
Metals				
ARSENIC	5.5E-01	1.8E-01	1.4E+01	1.4E+00
CADMIUM	9.0E-02	6.5E-03	1.7E-01	1.7E-02
CHROMIUM	1.2E+00	2.5E-01	5.0E-01	1.2E-01
COPPER	6.7E-02	5.1E-02	3.5E-01	2.7E-01
LEAD	3.7E+01	3.7E+00	6.8E+00	6.8E-01
MERCURY	2.8E+00	2.8E-01	7.3E-01	1.5E-01
NICKEL	2.0E-02	1.4E-02	4.9E-02	2.5E-02
SILVER	4.8E-02	4.8E-03	1.4E-01	1.4E-02
ZINC	7.5E-01	8.3E-02	8.8E-02	4.4E-02

Cells are shaded if the value is greater than 1.0

TABLE 8-7
TERRESTRIAL FOOD CHAIN MODEL - AVERAGE SCENARIO - INSECTIVOROUS AND HERBIVOROUS RECEPTORS
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Chemical	Herbivorous Receptors				Insectivorous Receptors			
	Bobwhite Quail		Meadow Vole		American Robin		Short-tailed Shrew	
	NOAEL EEQ	LOAEL EEQ	NOAEL EEQ	LOAEL EEQ	NOAEL EEQ	LOAEL EEQ	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics								
BENZO(A)ANTHRACENE	1.3E-03	1.3E-04	2.7E-02	2.7E-03	2.2E-02	2.2E-03	1.6E-01	1.6E-02
CHRYSENE	1.3E-03	1.3E-04	2.7E-02	2.7E-03	2.2E-02	2.2E-03	1.6E-01	1.6E-02
FLUORANTHENE	4.1E-03	4.1E-04	1.6E-03	8.0E-04	5.2E-02	5.2E-03	5.0E-03	2.5E-03
PHENANTHRENE	3.4E-03	3.4E-04	1.9E-02	1.9E-03	3.6E-02	3.6E-03	4.3E-02	4.3E-03
Pesticides/PCBs								
4,4'-DDE	6.1E-03	1.0E-03	1.2E-04	2.4E-05	4.9E+00	8.5E-01	3.3E-02	6.7E-03
4,4'-DDT	6.5E-03	1.1E-03	1.1E-04	2.2E-05	6.0E+00	1.0E+00	4.1E-02	8.1E-03
AROCLOR-1254	4.6E-03	4.6E-04	2.0E-02	2.0E-03	2.0E+00	2.0E-01	3.2E+00	3.2E-01
AROCLOR-1260	3.0E-04	3.0E-05	1.0E-03	1.0E-04	1.5E-01	1.5E-02	2.4E-01	2.4E-02
AROCLOR-1268	2.2E-04	2.2E-05	7.7E-04	7.7E-05	1.1E-01	1.1E-02	1.7E-01	1.7E-02
Metals								
ARSENIC	2.4E-02	7.9E-03	9.9E-01	9.9E-02	3.0E-01	1.0E-01	3.5E+00	3.5E-01
CADMIUM	1.0E-02	7.4E-04	5.6E-02	5.6E-03	7.5E-01	5.4E-02	6.5E-01	6.5E-02
CHROMIUM	4.3E-02	8.6E-03	2.9E-02	7.2E-03	7.1E-01	1.4E-01	1.3E-01	3.2E-02
COPPER	5.9E-03	4.5E-03	7.1E-02	5.5E-02	9.6E-02	7.3E-02	2.3E-01	1.8E-01
LEAD	9.7E-02	9.7E-03	3.0E-02	3.0E-03	1.4E+00	1.4E-01	1.2E-01	1.2E-02
MERCURY	1.7E-01	1.7E-02	1.3E-01	2.6E-02	2.4E+00	2.4E-01	2.9E-01	5.9E-02
SILVER	1.2E-04	1.2E-05	4.4E-04	4.4E-05	1.6E-02	1.6E-03	2.2E-02	2.2E-03
ZINC	5.2E-02	5.8E-03	1.7E-02	8.6E-03	2.4E+00	2.6E-01	1.3E-01	6.5E-02

Cells are shaded if the value is greater than 1.0

EEQ - Ecological Effects Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level

TABLE 8-8
TERRESTRIAL FOOD CHAIN MODEL - AVERAGE SCENARIO - PISCIVOROUS RECEPTORS
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Chemical	Piscivorous Receptors			
	Great Blue Heron		Raccoon	
	NOAEL EEQ	LOAEL EEQ	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics				
BENZO(A)ANTHRACENE	2.3E-02	2.3E-03	2.0E-01	2.0E-02
CHRYSENE	2.9E-02	2.9E-03	2.5E-01	2.5E-02
Pesticides/PCBs				
4,4'-DDE	3.4E+00	5.9E-01	2.8E-02	5.6E-03
AROCLOR-1260	2.2E-01	2.2E-02	4.2E-01	4.2E-02
AROCLOR-1268	7.1E-01	7.1E-02	1.4E+00	1.4E-01
DIELDRIN	8.8E-02	8.8E-03	2.5E-01	2.5E-02
Metals				
ARSENIC	3.3E-01	1.1E-01	4.9E+00	4.9E-01
CHROMIUM	6.2E-01	1.2E-01	1.4E-01	3.6E-02
LEAD	1.4E+01	1.4E+00	1.5E+00	1.5E-01
MERCURY	1.2E+00	1.2E-01	1.9E-01	3.8E-02

Cells are shaded if the value is greater than 1.0

EEQ - Ecological Effects Quotient
NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level

TABLE 9-1
COPCs AND CONTAMINANTS EXCEEDING SCREENING CRITERIA
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Media	Criteria (1)	Contaminants Exceeding Criteria	
		Organic Compounds	Metals
Surface Water	AWQC -CCCC	DDT	Aluminum Lead
	MCL	-	Thallium
Sediment	Region IX PRGs	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)flouranthene Dibenzo(a,h)anthracene Aroclor 1268	Aluminum Arsenic Iron Lead Manganese
	Soil DECs	Benzo(a)pyrene	Arsenic Lead
Groundwater	MCL	Trichlorethene Tetrachloroethene	Arsenic Cadmium
	GA Groundwater Objectives	Trichlorethene Tetrachloroethene	Cadmium
Soil	Region IX PRGs	Benzo(a)pyrene Benzo(a)anthracene Benzo(b)flouranthene Benzo(k)flouranthene Chrysene Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene Napthalene Pyrene Flouranthene Carbazole 1,2,4-Trimethylbenzene Aroclors 1254, 1248	Aluminum Arsenic Iron Lead Manganese
	Soil DECs	Benzo(a)pyrene Benzo(a)anthracene Benzo(b)flouranthene Benzo(k)flouranthene Chrysene Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene Total Petroleum Hydrocarbons	Arsenic Beryllium Lead

(1) Criteria - AWQC - CCCC: Ambient Water Quality Criteria Chronic
MCLs: Maximum Contaminant Levels
Region IX PRGs: Preliminary remediation goals, industrial commercial exposure
Soil DECs: RIDEM industrial commercial exposures
GA Groundwater Objectives: RIDEM groundwater objectives for GA aquifers

FIGURES

FIGURE 1-4

BUILDING 185 STORAGE SHED COMPLEX
VIEW TO THE NORTH
NUSC DISPOSAL AREA
STUDY AREA SCREENING EVALUATION
NUWC, MIDDLETOWN RHODE ISLAND

Building 185, North Side of pavement, showing two open shed storage areas. The shed in foreground has no roof. View is to the north. Photo taken June 2003, Tetra Tech NUS, Inc.

FIGURE 8-1
NAVY TIERED APPROACH
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND

Navy Ecological Risk Assessment Tiered Approach

RPM Input and Risk Management Consideration[3]

Step 8: Risk Management

Tier 1. Screening Risk Assessment (SRA): Identify pathways and compare exposure point concentrations to bench marks.

Step 1: Site visit; Pathway Identification/Problem Formulation; Toxicity Evaluation

Step 2: Exposure Estimate; Risk Calculation (SMDP)[1]

Proceed to Exit Criteria for SRA

Exit Criteria for the Screening Risk Assessment: Decision for exiting or continuing the ecological risk assessment.

1) Site passes screening risk assessment. A determination is made that the site poses acceptable risk and shall be closed out for ecological concerns.

2) Site fails screening risk assessment: The site must have both complete pathway and unacceptable risk. As a result the site will either have an interim cleanup or moves to the second tier.

Tier 2. Baseline Ecological Risk Assessment (BERA): Detailed assessment of exposure and hazard to "assessment endpoints" (ecological qualities to be protected). Develop site specific values that are protective of the environment.

Step 3a: Refinement of Conservative Exposure Assumptions[2] (SRA)- ---**Proceed to Exit Criteria for Step 3a**

Step 3b: Problem Formulation - Toxicity Evaluation; Assessment Endpoints; Conceptual Model; Risk Hypothesis (SMDP)

Step 4: Study Design/DQO - Line of Evidence; Measurement Endpoints; Work Plan and Sampling & Analysis Plan (SMDP)

Step 5: Verification of Field Sampling Design (SMDP)

Step 6: Site Investigation and Data Analysis (SMDP)

Step 7: Risk Characterization

Proceed to Exit Criteria for BERA

Exit Criteria Step 3 a Refinement

1) If re-evaluation of the conservative exposure assumptions (SRA) support an acceptable risk determination then the site exits the ecological risk assessment process.

2) If re-evaluation of the conservative exposure assumptions (SRA) do not support an acceptable risk determination then the site continues in the Baseline Ecological Risk Assessment process. **Proceed to Step 3b.**

Exit Criteria Baseline Risk Assessment

1) If the site poses acceptable risk then no further evaluation and no remediation from an ecological perspective is warranted.

2) If the site poses unacceptable ecological risk and additional evaluation in the form of remedy development and evaluation is appropriate, proceed to third tier.

Tier 3. Evaluation of Remedial Alternative (RAGs C)

a. Develop site specific risk based cleanup values.

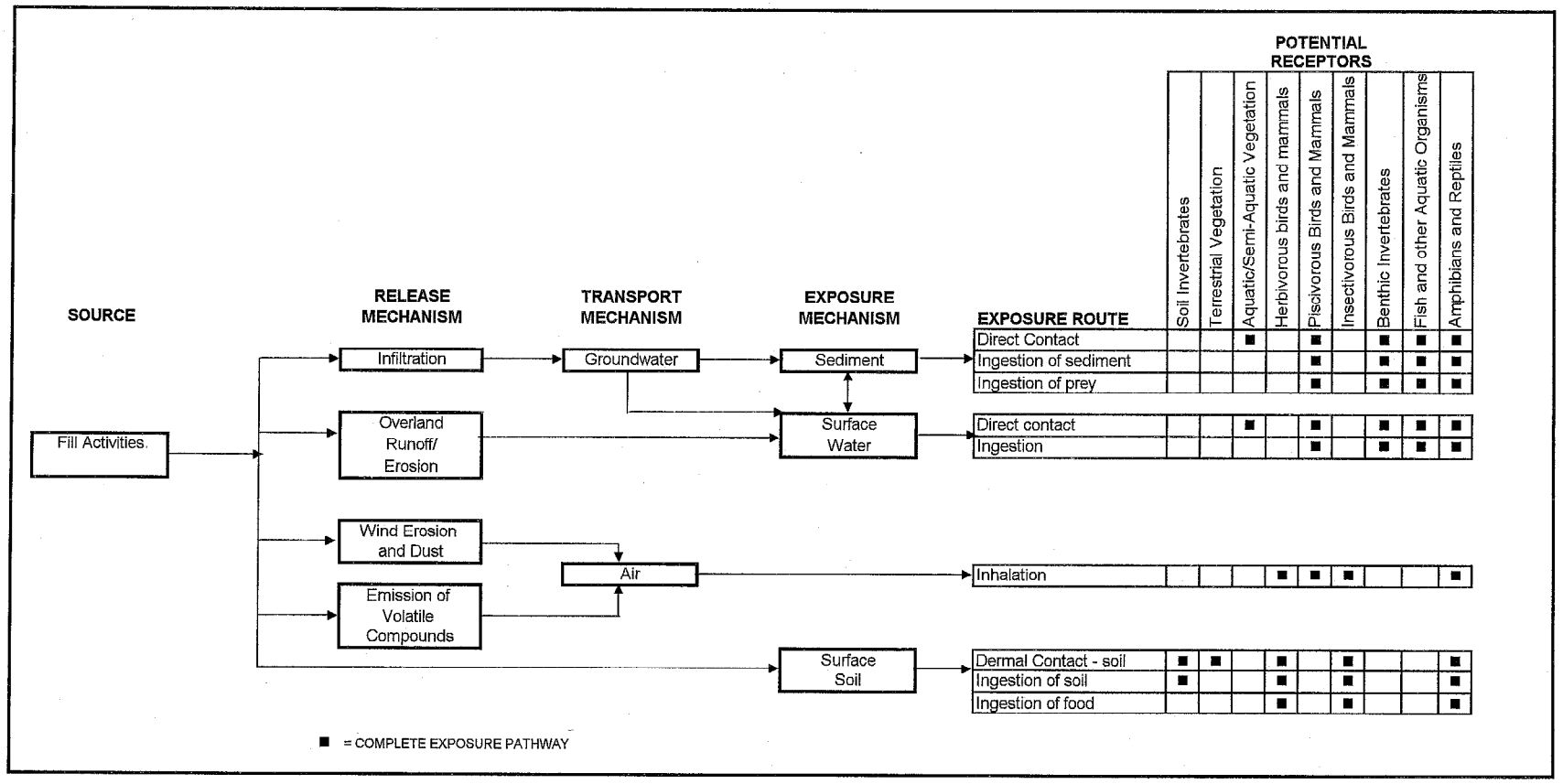
B. Qualitatively evaluate risk posed to the environment by implementation of each alternative (short term) impacts and estimate risk reduction provided by each (long-term) impacts; provide quantitative evaluation where appropriate. Weigh alternative using the remaining CERCLA 9 Evaluation Criteria. Plan for monitoring and site closeout.

Notes: 1) See EPA's 8 Steps ERA Process for requirements for each Scientific Management Decision Point (SMDP).

2) Refinement Includes but is not limited to background, bioavailability, detection frequency. Etc.

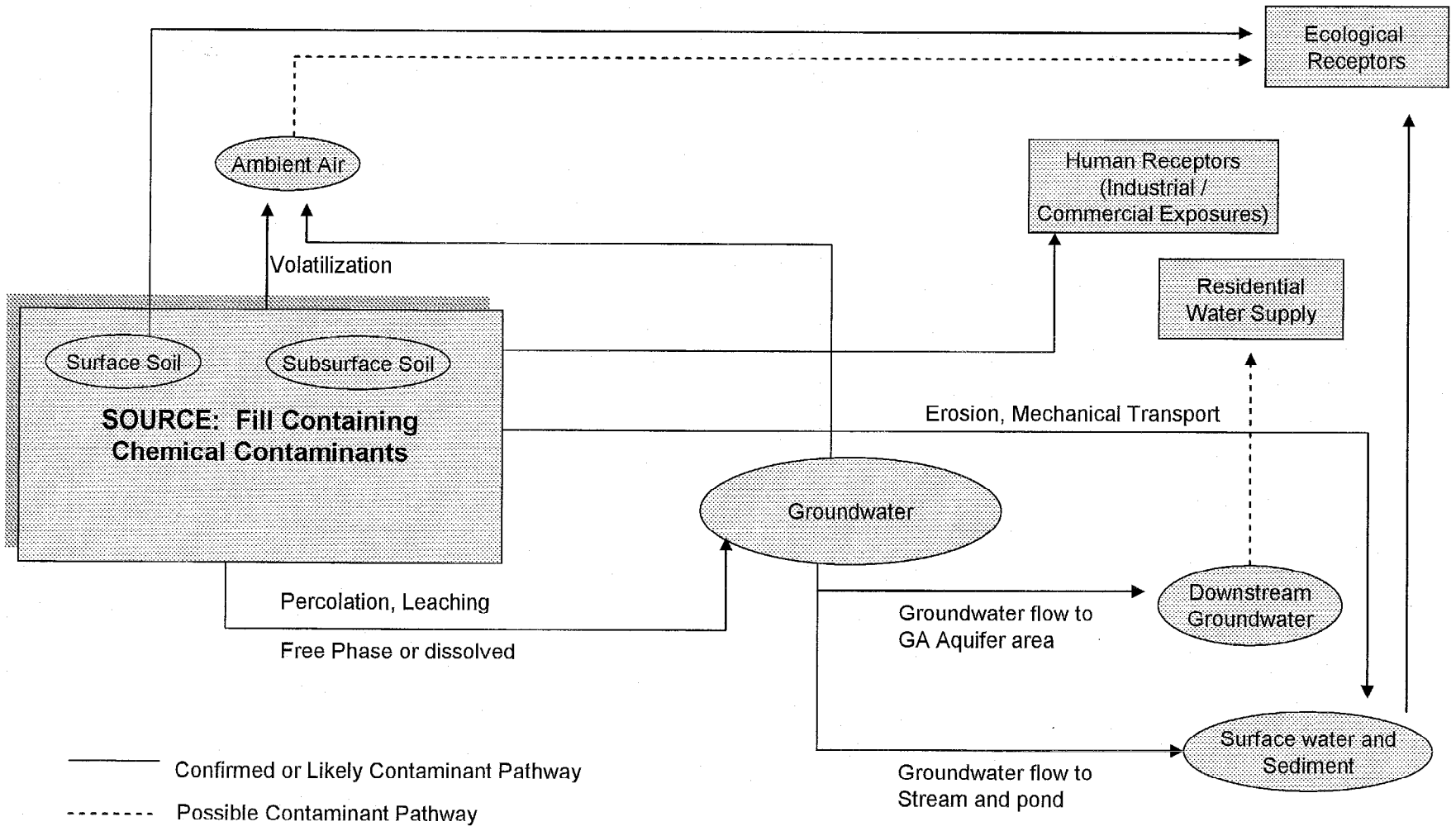
3) Risk Management is incorporated throughout the tiered approach.

FIGURE 8-2
ECOLOGICAL CONCEPTUAL SITE MODEL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND



Blank space indicates incomplete exposure pathway or relatively insignificant, or not applicable, potential exposure.

FIGURE 9-2
FIRST TIER CONCEPTUAL SITE MODEL
DRAFT STUDY AREA SCREENING EVALUATION
NUSC DISPOSAL AREA
NUWC, MIDDLETOWN, RHODE ISLAND



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APPENDIX A

PHOTOS AND VIDEOS OF TEST PIT EXCAVATIONS

APPENDIX B

FIELD LOGS

B1 – TEST PIT LOGS
B2 – BORING LOGS
B3 – WELL CONSTRUCTION LOGS

B1 – TEST PIT LOGS

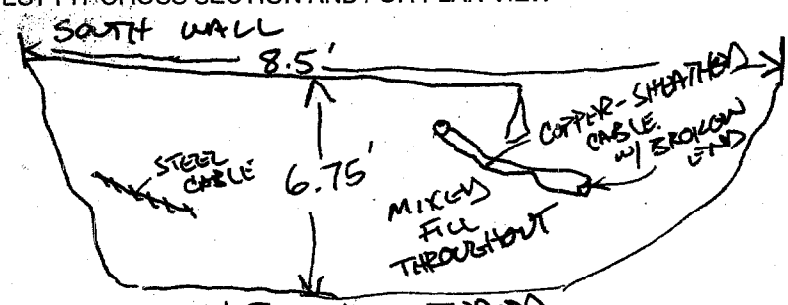
TEST PIT LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP01
DATE: 8-11-03
TtNUS Representative: T. DURGAN

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: FID Source (ppm)	PID/FID READING: FID BZ (ppm)
0		GRASS/SHRUB SURFACE				
1–5		FILL. MIXTURE OF SILT, F-C SAND F-C GRAVEL, COBBLES & BOULDERS. MAN-MADE DEBRIS NOTED INC. BRICK, CONCRETE, ASPHALT RUBBLE, METAL PIPE, METAL CABLE (@ 4' BGS ON WEST END) AND A COPPER-SHEATHED	FILL SW	DA-S-TP01-0001-01 8-11-03 @ 1200	0.4	0.0
6–7		STEEL OR ALUM. CABLE CROSSING THE EAST END @ 1.25' BGS. EOP @ 6.75' BGS. STOPPED EXCAVATION DUE TO		DA-S-TP01-0304-01 8-11-03 @ 1140	2.0	↓
		COLLAPSING SIDEWALLS.		DA-S-TP01-0607-01 8-11-03 @ 1130 BOTTOM SAMPLE.	0.0	0.0

TEST PIT CROSS SECTION AND / OR PLAN VIEW



Water Level Depth: NOT ENCOUNTERED.

Pit Dimensions: Length: 8.5 Width: 3' Depth: 6.75'

Equipment Used: TAKEUCHI SM. EXC.

REMARKS:

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: PHOTO'S PRIOR TO EXC., EACH WALL.

Tetra Tech NUS, Inc.

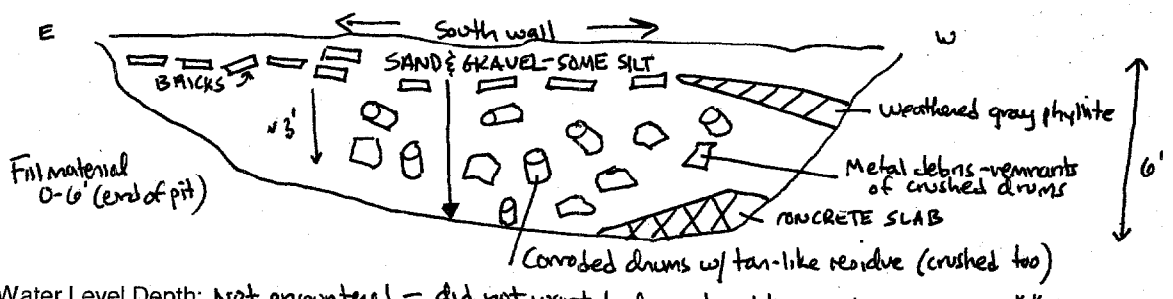
TEST PIT LOG

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI

TEST PIT No.: TP02
DATE: 8-13-03
TtNUS Representative: K Jalkut

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm) + Headspace (HS)	PID/FID READING: BZ (ppm)
0		Grass / Weeds @ surface				
1	SAND & GRAVEL - SOME SILT	SAND AND GRAVEL - SOME SILT. - Mixture of f-c sand, well graded; f & c subang to subrounded gravel 1/2-2 in, cobbles to 4 in, brown-gray brown - Yellow + Red bricks (east end to middle) - Weathered gray phyllite - broken (west end) - Corroded drums w/ tar-like residue, black - Metal debris - remnants of crushed drums	GM	DA-S-TP02-0001-01 (0-1') @ 1255 hr Fill DA-S-TP02-0102-01 (1-2') @ 1315 hr *	Source = 0 ppm HS: 0-1' PID = 4.7 ppm FID = 1.2 ppm	0 ppm
2	fewer gravels	GRAVELLY SAND - SOME SILT - Similar mixture to above w/ fewer f-c gravels - Cobbles to 3.25 in - Brown to dark brown - Corroded drums w/ tar-like residue (west end)	SM	DA-S-TP02-0203-01 (2-3') @ 1245 hr DA-S-TP-DUP02-01 (2-3') @ 1250 hr.	Source = 0 ppm HS (2-3'): PID = 10.5 ppm FID = 2.3 ppm	0 ppm
3	SAND & GRAVEL - SOME SILT	SAND AND GRAVEL - SOME SILT				
4		- Similar mixture to above (0-2'); More gravels than 2-3' - less coarse sand visible - mainly f-m sand - Visible drums w/ tar-like residue (west end); none on east end - More metal debris - remnants of crushed drums	GM		Source = 0 ppm	0 ppm
5						
6		- More fine gravel vs. f+c gravel @ 5'; damp, brown - More coarse sand (f-c sand) visible - F-c gravel up to 2 in; dk gray - Damp; Slabs of concrete @ 6' (west end)		DA-S-TP02-0506-01 (5-6') @ 1230 hr Concrete slab @ west end	Source = 0 ppm HS (5-6') FID/PID = 0 ppm	0 ppm

TEST PIT CROSS SECTION AND / OR PLAN VIEW NOT TO SCALE



Water Level Depth: Not encountered - did not want to drag tar-like residue to water **

Pit Dimensions: Length: 17' Width: 5' MAX Depth: 6' (west end) Equipment Used: Takeuchi TB175 excavator (small)

REMARKS: Drum source area - corroded drums visible in sidewalls + bottom - appear to extend N+S into sidewalls. Residue is tar-like inside drums - breaks off easily in chunks when not hot outside ** petroleum-like odors to residue

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: Excavation prior to digging; all walls - video; drum in excavator jaw

* Collected sample of tar at RIDEMs request + navy approval - sent to lab

** In increased temp, tar-like residue melts + spreads out (determined at later time)

*** w/ navy approval, did not delineate extent of drums or excavate to water table in case material is brought down w/ excavation

OVER-PACK 1 DRUM W/ TAR-LIKE RESIDUE (~50% OF DRUM INTACT - 55gal?)
CONTAINERIZE SOME REMNANTS OF DRUMS FOR ∫ AS IDW.

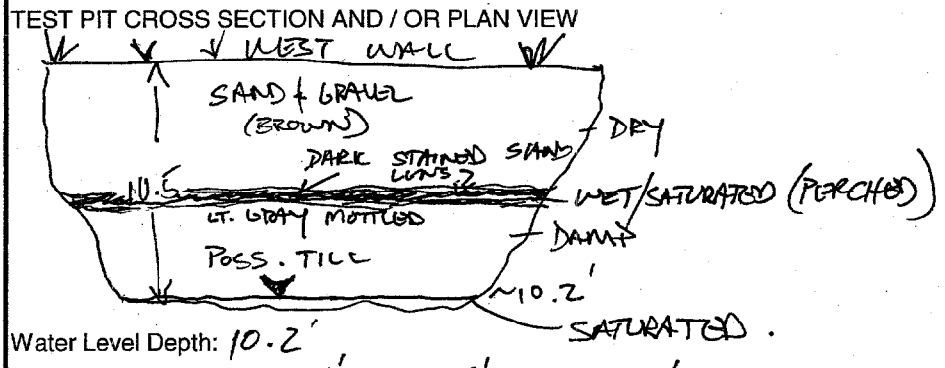
TEST PIT LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP05
DATE: 8-11-03
TtNUS Representative: T. DORGAN

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: FID + PID Source (ppm)	PID/FID READING: FID + PID BZ (ppm)
0		GRASS SURFACE				
5	BROWN/ GRAY	SAND + GRAVEL. MOSTLY F-C WELL GRADED SAND. SOME F-C GRAVEL, FEW COBBLES + TRACE ROUNDED BOULDERS.	SW	DA-S-TP05-0001-01 @ 1545	0.0	0.0
10	BLACK / LT. GRAY MOTTLED W/ YELLOW-ORANGE	TRACE CONCRETE SAND @ UPPER CONTACT WITH DARK BROWN-BLACK @ 6.5'. POSS. TILL. DENSE MIXTURE OF CLAY, SILT, SAND, GRAVEL, TRACE COBBLES + BOULDERS	SP LN / ML/SM	DENSE. WET DA-S-TP05-0607-01 @ ~~1545~~ 1445	0.0	0.0
	EOPC 10.5'	END. EXCAVATION @ 10.5' WATER TABLE ENCOUNTERED. @ ~10.2'	GGS	DA-S-TP05-0910-01 @ 1515 + DA-S-TP-DUP01-01 @ 1520	0.0	0.0
		NO SIGN OF CONTAMINATION NOTED ON GROUNDWATER ENTERING EXCAVATION. NO ODOR OR SHEEN NOTED.				

TEST PIT CROSS SECTION AND / OR PLAN VIEW



Water Level Depth: 10.2'

Pit Dimensions: Length: 9.5' Width: 3-4' Depth: 10.5' Equipment Used: SM. EXCAVATOR

REMARKS:

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: DIG. STILLS + VIDEO EACH SIDE SHOWN.

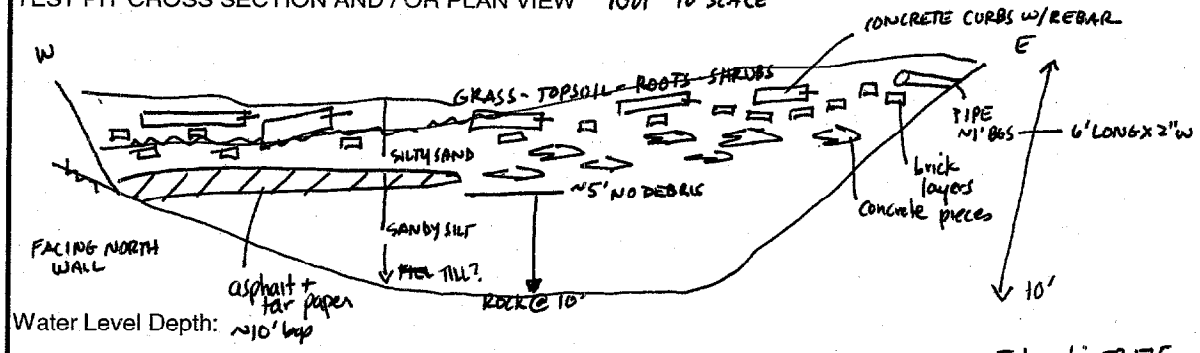
TEST PIT LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP06
DATE: 8-13-03
TtNUS Representative: K Jalkut

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm) + Headspace (HS)	PID/FID READING: BZ (ppm)
0		Grass/Shrub surface w/roots				
1, 2, 3	SILTY SAND; coarser sand ?	-SILTY SAND – Mostly f-m sand, poorly graded, brown, dnf, organic roots – visible concrete curbs w/rebar - up to 5' long – brick layer (yellow, red, black) – concrete chunks – asphalt ? – (more coarse sand - more well graded – blackish/brownish/gray color)	SM FILL	DA-S-TP06-0001-01 (0-1') @ 1015hr DA-S-TP06-0304-01 (3-4') @ 1005hr (MS/MSD)	Source = 0 HS-0-1' PID 5.2 FID 0 Source = 0 PID - 5.6 FID - 0	0
4, 5, 6	(gravels) ?; SILTY SAND	– f/m sand mostly; tr. gravel up to 2" – bricks - reddish orange color to soil – burlap (green)/asphalt ?/tar paper visible on south wall; asphalt/tar on north wall	FILL	NO VISIBLE DEBRIS 5-6'	Source-0	0
7, 8	~7'	SANDY SILT – mostly silt, f-c sand, brown	SM NATIVE ?	NO VISIBLE DEBRIS 6-7' POT. NATURAL SOIL @ 7' NO VISIBLE DEBRIS 7-10'	Source-0	0
9, 10	~9.5'	~~POSSIBLE TILL - UNSORTED~~ DENSE MIX OF SAND, SILT, C-GRAVEL, CLAY-SIZED PARTICLES, BROWN, WET @ 10'. VISIBLE PHYLLITE @ 10'	SC	DA-S-TP06-0910-01 (9-10') @ 0950hr	Source-0 HS-9-10' FID = 0 PID = 0	0

TEST PIT CROSS SECTION AND / OR PLAN VIEW NOT TO SCALE



Water Level Depth: ~10' bgs

Pit Dimensions: Length: ~22' Width: ~4-5' Depth: ~10'

Equipment Used: Takeuchi TB 175 excavator (small)

REMARKS: – Possible organic sheen on groundwater - grayish, blocky, breaks apart + does not reform

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: Area prior to excavation; possibly all but south wall (too unstable to get photo); video

Note - Piece of green burlap visible on south wall @ ~4' bgs
Color change from grayish/brownish/blackish to reddish-orange @ ~4' - coincides w/more bricks
No visible petroleum sheen or odors on soils or water

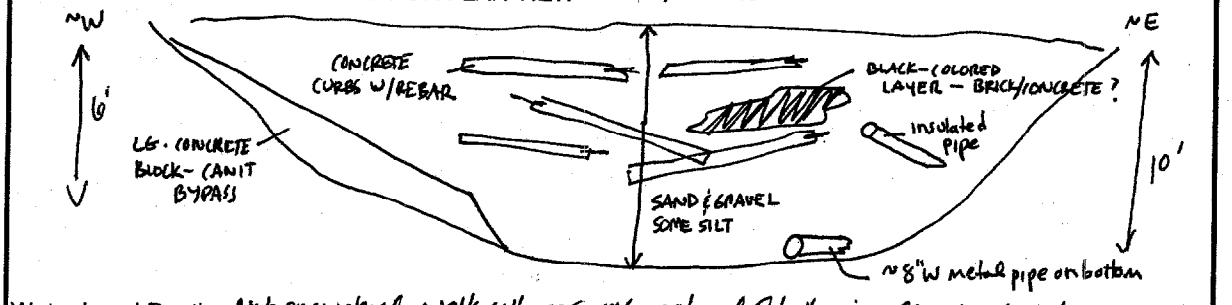
Tetra Tech NUS, Inc.

TEST PIT LOG

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP 07
DATE: 8-12-03
TtNUS Representative: K Jalkut

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm) Headspace	PID/FID READING: BZ (ppm)
0		SHRUB SURFACE – OPEN ENDED METAL CYLINDER ON SURF / 12x12" LONG TIMBERS				
1	SAND & GRAVEL - SOME SILT	SAND AND GRAVEL - SOME SILT. - Mixture of f-c sand, well graded; f+c gravel, subrounded ½-3 in; construction rubble (concrete, brick, metal etc.), brown cobbles > 3"	GM/ FILL	DA-S-TP07-0001-01 (0-1') @ 1245 hr	Source = 0 HS - 0-1' FID - 0 PID - 0	0
2						
3	FILL ↓	– Similar to above w/ subangular gravel		DA-S-TP07-0304-01 (3-4') @ 1230 hr	Source = 0 HS 3-4' FID - 0	0
4	DEBRIS	– Black concrete/brick – fireproof brick? – Clinkers ? – cobbles		(TARGETED SOIL AROUND BLACK LAYER)	PID - 0	
5						0
6	SILTY SAND & GRAVEL	– Similar to above			Source - 0	
7						
8		– Similar to above w/ debris incl. insulated pipe (3-4" w)			Source - 0	0
9		– Similar to above w/ additional constr. debris, phyllite fragments – Debris includes – fire proof brick, cinder blocks, plastic, concrete w/ rebar, 8" w pipe section		DA-S-TP07-0910-01 (9-10') @ 1140 hr	Source - 0 HS 9-10' FID - 0 PID - 0	0
10				DAMP BOTTOM		

TEST PIT CROSS SECTION AND / OR PLAN VIEW NOT TO SCALE



Water Level Depth: Not encountered – walls collapse @ 10' – material @ bottom is soft – close to water

Pit Dimensions: Length: ~15' Width: ~5' Depth: ~10' Equipment Used: Takeuchi TB175 excavator (small)

REMARKS: No petroleum-like stains visible. Black colored layer may be concrete/brick or clinkers

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: Before excavation; all walls; video

P. Kulpa (RIDEM) onsite w/ Navy personnel (K. Manley) @ ~11:30 AM
Permission by P. Kulpa to back fill once sampled.

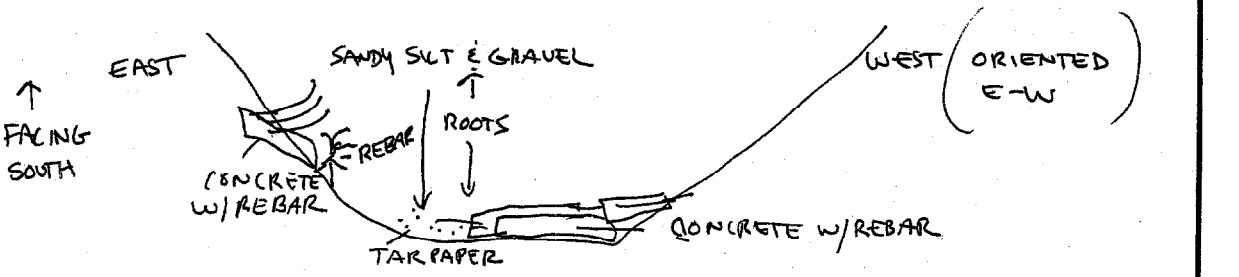
Tetra Tech NUS, Inc.

TEST PIT LOG

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP08
DATE: 8/15/03
TtNUS Representative: KJ / TD

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.) SHRUBS	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm)	PID/FID READING: BZ (ppm)
1	SANDY SILT & GRAVEL	SANDY SILT & GRAVEL / FILL - DK BROWN F/C SAND, W/G, ANGULAR GRAVELS F+C, COBBLES, DAMP, ROOTS	GM	MOUNDED SURFACE DA-S-TP08-0001-01 (0-1') @ 1150 FILL	Source= 0	0
2					HS= 0 PID 0 FID	
3		CONCRETE W/REBAR - CURBING		DA-S-TP08-0304-01 (3-4') @ 1130	Source= 0	0
4		- DAMP		DA-S-DUP-05-01 @ 1140	HS= 0 PID 0 FID	
5						
6					Source= 0	0
7		CONCRETE W/REBAR / SANDY SILT & GRAVEL / FILL TAR PAPER LIKE SUBSTANCE W/ FIBERS SLAG		DA-S-TP08-0708-01 @ 1115 hr	HS= 17.0 (PID)	
8				(7-8') V. MOIST	1.9 (FID) TAR LIKE PAPER IN HS JAR	

TEST PIT CROSS SECTION AND / OR PLAN VIEW



Water Level Depth: NOT ENCOUNTERED. BOTTOM BLOCKED BY CONCRETE CURBS W/REBAR (COULD NOT BYPASS)
Pit Dimensions: Length: 13 Width: 3-4 Depth: ~~7.5~~ 6.0' Equipment Used: Takeuchi TB 175

REMARKS: ALL FILL MATERIAL

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: Pre excavation; all walls

PK + K. Marley onsite @ ~10. Offsite @ 1115.
TK requested Xtra pits @ TP09 based on hits by metal detector - Navy approve 6' depth per PK - no Xtra silt fence needed per PK.

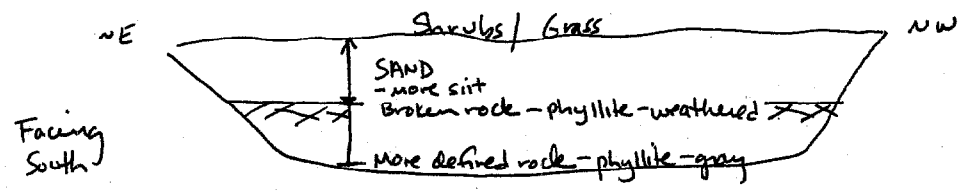
TEST PIT LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP09
DATE: 8-14-03
TtNUS Representative: K Jalkut

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm) + Headspace	PID/FID READING: BZ (ppm)
0		Shrubs / Grass Surface - Roots				
0.5'	SAND	SAND - TR SILT - Mostly f-m sand, poorly graded, loose, dk brown, dry, organic roots	SP	DA-S-TP09-0001-01 (0-1') @ 1410 hr	Source=0 HS-0-1' FID=0 PID=0	0
1	- More silt	SAND - SOME SILT - Similar to above w/ more silt, reddish brown	SM	DA-S-TP09-0102-01 (1-2') @ 1350 hr 1345 hr 8-14-03 DA-S-TP-DUP04-01 (1-2') @ 1350 hr	Source=0 HS-1-2' FID-0 PID-0	0
2	weathered rock	Broken rock - little to no soil - phyllite - crumbles w/ finger pressure	Broken Rock	No samples for lab → rock	0	0
3	Rock	- more definition to rock Phyllite - weathered - fissile - gray	Rock			
		End of Pit @ ~3'				

TEST PIT CROSS SECTION AND / OR PLAN VIEW Not to scale



Water Level Depth: Beneath rock - not encountered

Pit Dimensions: Length: ~11 Width: ~3 Depth: ~3 Equipment Used: Takeuchi TB175 excavator (small)

REMARKS: All likely native soils. No debris observed. No stains or odors.

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: Prior to excavation, all walls; video

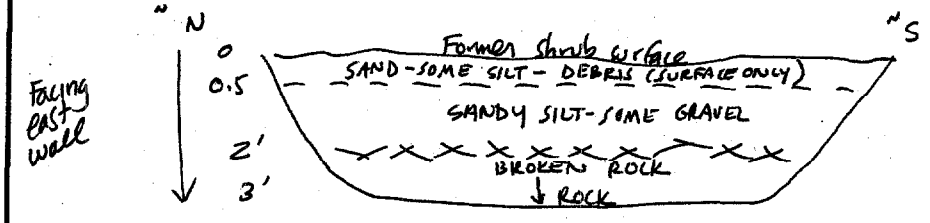
Tetra Tech NUS, Inc.

TEST PIT LOG

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP 10
DATE: 8-14-03
TtNUS Representative: K Jalkut T. Dorgan

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm) Headspace	PID/FID READING: BZ (ppm)
0		Former shrub surface - now cleared				
1	Sand-some silt	Topsoil - SAND - SOME SILT. f-m sand, poorly graded, organic roots, dark brown, dry, fill debris (1 nail, plastic, metal strip, steel cable)	SM Fill 0-0.5'	DA-S-TP10-0001-01 (0-1') @ 1500hr	Source=0 HS-0-1' FID-0 PID-8.1	0
2	~1' Till?	SANDY SILT - SOME GRAVEL Mostly silt, tr. clay-sized particles, f. sand, poorly graded, f&c gravel up to 2in - subangular, yellow-brn dense	GM?	Potential native soil Till ?? DA-S-TP10-0102-01 (1-2') @ 1455hr	Source=0 HS 1-2' FID-0 PID-21.2	0 (?)*
3	~2' rock	Broken rock w/ little soil similar to 1-2'. Bedrock @ ~2.5' - Weathered, fissile, phyllite (more defined than @ 2')	Rock	No sample for lab analysis	Source-0	0
		End of pit @ ~3'				

TEST PIT CROSS SECTION AND / OR PLAN VIEW



Water Level Depth: Not encountered. Below rock @ end of pit ~3'

Pit Dimensions: Length: ~11 Width: ~3 Depth: ~3 Equipment Used: Takeuchi TB175 excavator → small

REMARKS: Shallow bedrock - weathered - 1st encountered @ ~2' bgs. More defined @ ~3' bgs. Shallow - surface debris 0-0.5'.

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: Pre-excavation; all walls - video too

* PID reading may not be real - instrument is very warm (direct sunlight concern).

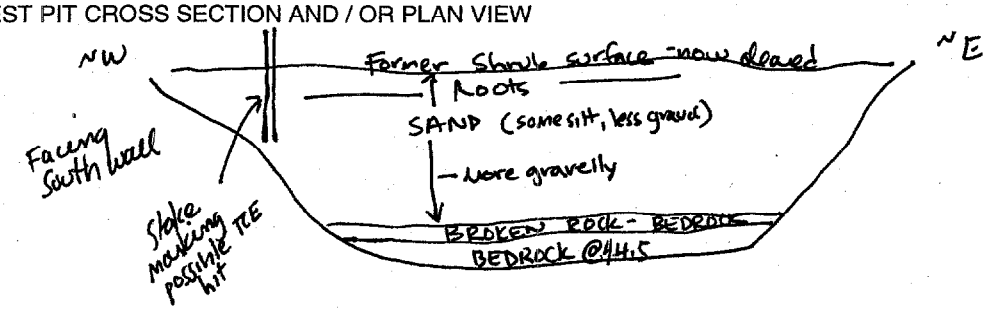
TEST PIT LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP11
DATE: 8-14-03
TtNUS Representative: K. Jalkut

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm) & Headspace (HS)	PID/FID READING: BZ (ppm)
0						
1	SAND -more silt than gravel	SAND - SOME SILT - TR. GRAVEL Mostly fine, some med. sand, poorly graded, coarse subangular gravel to 1", loose, dk brown, organic roots	SP	Topsoil DA-S-TP11-0001-01 (0-1') @ 0920 hr No stains, debris, or odors Potentially native soil	Source = 0 HS 0-1' PID-2.6 FID-0	0
2 3	-more gravel than silt	SAND - SOME GRAVEL - TR. SILT Mostly f-m sand, tr. coarse sand, poorly graded, subrounded & subangular coarse gravel up to 1.5 in, brown, dry, loose - Similar to above (@ 2')	SP SP	DA-S-TP11-0203-01 (2-3') @ 0910 hr Potentially native soil DA-S-TP11-0304-01 (3-4') @ 0850 hr	Source = 0 HS 2-3' PID-NR* FID-0 HS 3-4' PID-NR*	0
4 5	Bedrock	- visible rock fragments (broken rock) Bedrock @ 4' - Weathered, fissile phyllite End of pit @ ~4.5'	Rock	Bedrock 4-4.5'	FID-0 Source-0 HS @ 4' (rock) PID-NR* FID-0	0

TEST PIT CROSS SECTION AND / OR PLAN VIEW



Water Level Depth: Not encountered - below top of rock

Pit Dimensions: Length: ~12 Width: ~3 Depth: ~4.5 Equipment Used: Takeuchi TB175 excavator (small)

REMARKS: Excavation directly under stake that marked a possible TCE hit w/ soil gas. Likely all native soils. Based soil sample collection by collecting soil samples in vicinity of TCE hit from soil gas

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: Excavation area, prior to digging; all walls - video too

* NR - Not recorded - not likely accurate - instrument in sun - too hot.

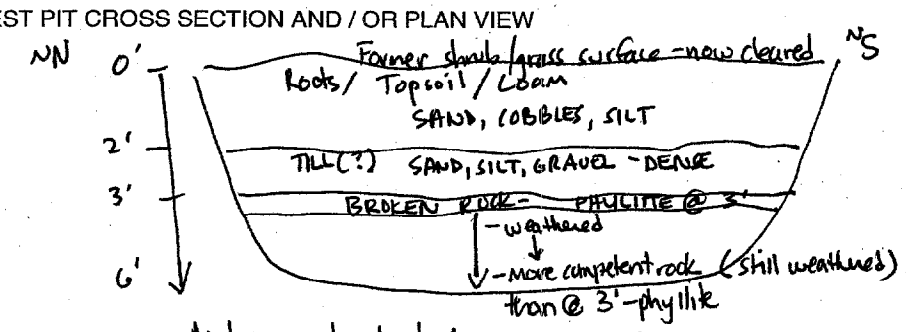
TEST PIT LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP 12
DATE: 8-13-03
TtNUS Representative: K Jalkut

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm) + Headspace (ppm)	PID/FID READING: BZ (ppm)
0		Former shrub/grass surface - now cleared				
1	SAND, COBBLES, SILT	SAND - SOME COBBLES - SOME SILT - f-m sand, poorly graded, rounded to subrounded cobbles up to 4in, organic roots, dry, dense, dk brown to gray brown	GM	DA-S-TP12-0001-01 (0-1') @ 1525 hr Topsoil / Loam	Source=0 HS 0-1' FID-0 PID-0	0
				DA-S-TP12-0102-01 (1-2') @ 1515 hr	Source-0 HS 1-2' FID=0 PID=0	0
2	TILL?	SAND - SOME SILT - TR. GRAVEL - f-m sand, poorly graded, coarse, sub-angular gravel up to 2", dk-gray to brown, dense	SM/ TILL?	DA-S-TP12-0203-01 (2-3') @ 1505 hr	Source-0 HS (2-3') FID-0 PID-0	0
3		- Change in color to brown only				
	Bedrock @ ~3'	Bedrock - weathered phyllite, soft, angular pieces (broken rock) up to 6" in length - Fissile	ROCK	No soil samples for lab analysis 3-6' (end of pit)	Source=0 HS (3-6') FID-0 PID-0	0
4						
5						
6		- Similar to above but rock is more competent than above (EOP@6')				

TEST PIT CROSS SECTION AND / OR PLAN VIEW



Facing east wall

Water Level Depth: Not encountered - below top of rock

Pit Dimensions: Length: ~12 Width: ~3.5 Depth: ~6

Equipment Used: Takeuchi TB175 Excavator (Small)

REMARKS: No debris observed - potentially all native soil. Possibly till above bedrock. Bedrock looks mound on "plateau". No petroleum stains or odors found

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: Prior to excavation; all walls - video too

Tetra Tech NUS, Inc.

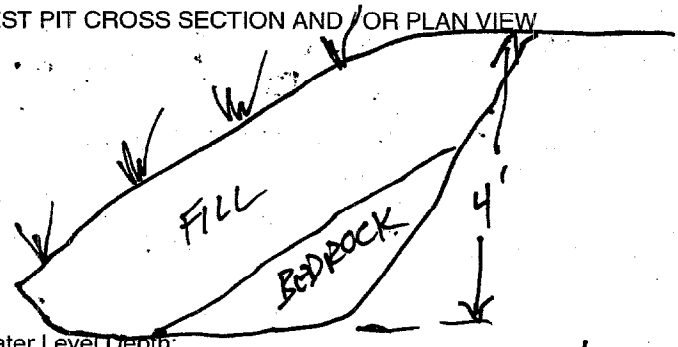
TEST PIT LOG

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP12-A
DATE: 8-15-03
TtNUS Representative: T. DORGAN

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm)	PID/FID READING: BZ (ppm)
0		VINE @ GRAND SURFACE.				
2		FILL. SILTY, SAND. ABUNDANT MAN-MADE DEBRIS INC. STEEL FRAME/BEAM, ALUM. SHEET METAL PLASTIC, FIBERGLASS PANEL + METAL WIRE.	SM/FILL	DA-S-TP12A-0001-01 @ 1445	0 PID + FID	0
4	~2.5-3'	BEDROCK (SAPROLITIC) @ ~2.5-3' BGS PHYLLITE/SHALE. LT. GRAY				
		EOT @ 4' BGS				

TEST PIT CROSS SECTION AND/OR PLAN VIEW

TP12 → (LOOKING SOUTH)



Water Level Depth:

Pit Dimensions: Length: 6' Width: 3' Depth: 4' MAX. Equipment Used: SM. EXCAVATOR

REMARKS: TEST PIT ADDED PER PAUL KULPA (RIDOH) REQUEST TO INVESTIGATE MAGNETIC ANOMALY HE FOUND USING A SCHONSTEDT MAG. LOCATOR LIKELY CAUSE BY 3' LONG STEEL FRAME + METAL WIRE.

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: PHOTO OF PIT FROM ABOVE LOOKING EAST + OF STEEL FRAME.

TEST PIT LOG

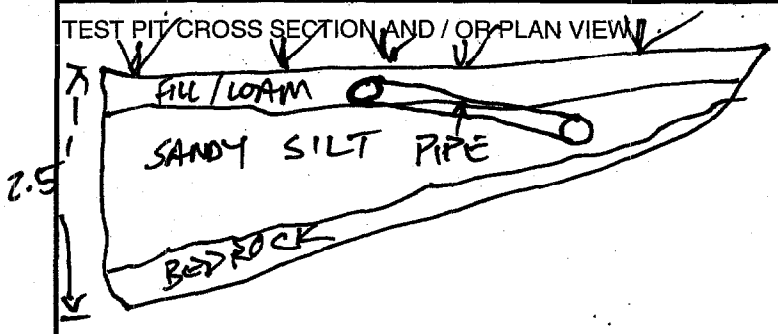
Tetra Tech NUS, Inc.

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP12-B
DATE: 8-15-03
TtNUS Representative: T. DURGIAN

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm)	PID/FID READING: BZ (ppm)
0		SHRUB/VINES @ SURFACE				
	6"	UPPER 6": LOAM. SILTY, FINE POORLY GRADED SAND, ROOT FIBER & LEAF LITTER ABUNDANT. SANDY, SILT. MOSTLY SILT SOME F-C SAND, TRACE GRAVEL OVERLYING SAPROLITIC	SP	PIPE (2" DIAM) IN UPPER 6" BENT & BROKEN STEEL. ~4' LONG. DA-S-TP12-B-0001-01 @ 1415	0 PID & FID	0
2		BEDROCK (PHYLLITE/SHALE) DEPTH TO BEDROCK VARIES, DUE TO SLOPE OF ROCK SURFACE, FROM 1.5-2.5.				
2.5'		EOP @ 2.5' BGS		NO VIS. OR OLFACTORY EVIDENCE OF CONTAMINATION FROM EITHER THE PIPE OR SOILS.		

TEST PIT CROSS SECTION AND / OR PLAN VIEW

LOOKING SOUTH



Water Level Depth:

Pit Dimensions: Length: 5' Width: 3' Depth: 2.5'

Equipment Used: SM. EXCAVATOR

REMARKS: TEST PIT ADDED PER PAUL KURPA (RIDEM) REQUEST TO INVESTIGATE MAGNETIC ANOMALY HE FOUND USING A SCHONSTEDT MAG. LOCATOR. MOST LIKELY CAUSED BY STEEL PIPE.

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: 1 PHOTO OF TEST PIT & 1 OF PIPE.

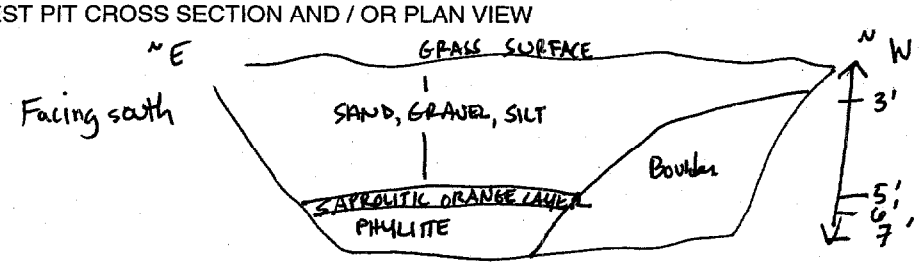
Tetra Tech NUS, Inc.

TEST PIT LOG

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP13
DATE: 8-15-03
TtNUS Representative: K. Jalkut / T. Dorgan

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm) + Headspace (ml)	PID/FID READING: BZ (ppm)
0		Grass surface				
1, 2	SAND & GRAVEL, SILT	SAND AND GRAVEL-SOME SILT - f-c sand, well graded, f-c gravel, subangular and subrounded up to 3 in, organic roots, dry, dk brown	GM	DA-S-TP13-0001-01 (0-1')@ 0930 hr	Source-0 HS- 0-1' FID- 4.1 PID- 5.2	0
3, 4	saprolite	~~8-15-03~~ - Boulder @ ~~south~~ west end of pit (could not bypass)	Boulder	DA-S-TP13-0203-01 (2-3')@ 0935 hr DA-S-TP13-0405-01 (4-5') @ 0900 hr (MS/MSD)	Source-0 HS 2-3' FID-0 PID-0 Source-0 HS 4-5' FID-0.9	0 0
5, 6, 7	Boulder @ 3-4' west end	Bedrock - saprolitic, decomposed metamorphic rock, fissile, orange - Phyllite bedrock more discernable End of pit @ ~7'	Rock		PID-4.1 Source-0 HS (6-7') FID-0 PID-0	0

TEST PIT CROSS SECTION AND / OR PLAN VIEW



Water Level Depth: Not encountered - water below top of rock

Pit Dimensions: Length: ~13.5 Width: ~3 Depth: ~7

Equipment Used: Takeuchi TB175 excavator (small)

REMARKS: Likely all native material. No debris observed. No petroleum staining or odors

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

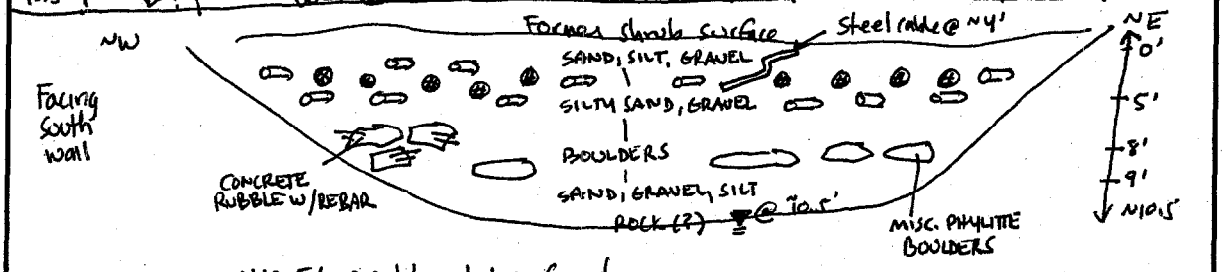
PHOTO LOG: Prior to excavation, all walls, video too

TEST PIT LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NUSC Disposal Area SA-08 TEST PIT No.: TP 14
PROJECT NUMBER: N8856-0530 DATE: 8-14-03
LOCATION: Newport, RI TtNUS Representative: K Jalkut

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm) Headspace(H)	PID/FID READING: BZ (ppm)
0		Former shrub surface - now cleared				
1 2 3	SAND, SOME SILT, GRAVEL DEBRIS	SAND - SOME SILT - SOME GRAVEL - f/m sand, tr. c. sand, poorly graded - f+c gravel, subrounded/subangular to 2" - roots, brown, damp — DEBRIS INCL. CORRODED CANS, CIRCULAR MESH SCREENS (~5 in diam)	SP/GP FILL	DA-S-TP14-0001-01 (0-1')@ 1210 hr NO DEBRIS START OF DEBRIS @ ~3'	Source=0 HS 0-1' FID-0 PID-1.2	0
4 5 6	SILT, SAND GRAVEL	— LONG STEEL CABLE SILTY SAND - SOME GRAVEL - f/m sand, tr. c. sand, poorly graded - f+c gravel, subrounded - subangular - gray brown	SM/GM FILL	DA-S-TP14-0506-01 (5-6')@ 1200 hr	Source-0 HS 5-6' FID-0 PID-1.8	0
7 8	DEBRIS	— DEBRIS INCL. - CORRODED CANS, MORE CIRCULAR MESH SCREENS, METAL STRAPPING, CONCRETE RUBBLE w/ REBAR (FORMER CURBS (?)) RED-BROWN CORRODED DEBRIS — PHYLLITE BOULDERS - LOOSE	BOULDERS	DEBRIS ENDS @ ~8' at boulders	Source-0	0
9 10	SAND, GRAVEL, SILT ROCK	SAND AND GRAVEL - SOME SILT. - F-C sand, well graded, f+c gravel up to 1.5 in - subrounded, red-brown, damp ROCK (?) - HARD SURFACE	SW/GW	DA-S-TP14-0910-01 (9-10')@ 1150 hr MS/MSD NO DEBRIS/STAINING	Source-0 HS 9-10' FID-0 PID-2.1	0
TEST PIT CROSS SECTION AND / OR PLAN VIEW						
10.5	?	WET @ ~10.5' - ON TOP OF ROCK ?				



Water Level Depth: ~10.5' - possibly at top of rock

Pit Dimensions: Length: ~16.5' Width: ~4.5' Depth: ~10.5' Equipment Used: Takeuchi TB 175 excavator (small)

REMARKS: Corroded cans may have been pressurized - rounded bottoms, approx. 6" length - found in large # open-ended 3'-6' bgs. Associated w/wire mesh screens. Likely all fill on top of rock (incl. loose boulders)

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: Prior to excavation, all walls, cans in excavator bucket
- No oil or other stained soil observed. No odors w/olfactory sense
- Debris ends @ ~8' on west end (concrete rubble w/rebar) + 6' on east end (cans)

TEST PIT LOG

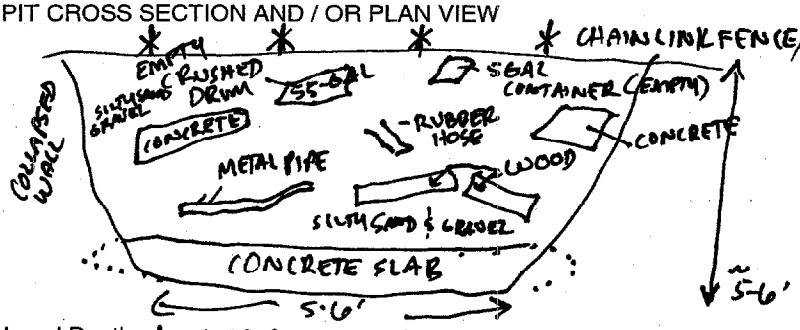
Tetra Tech NUS, Inc.

H 8/12/03

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP0215
DATE: 8-11-03/8/12/03
TtNUS Representative: T. DORGAN

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm)	BZ (ppm)
0		VEGETATED GROUND SURFACE w/ MASHAT SCALE FROM ADJACENT PARKING-LOT. 1ST EXC. BUCKET PULLS OUT AN OLD ~5GAL CONTAINER w/ BLACK TAR-LIKE RESIDUE. 0.0ppm PID & FID. 2ND EXC. BUCKET REMOVES A WHITE POLYETHYLENE CONTAINER (~15 GAL CAPACITY) EMPTY, 0.0ppm PID & FID. NO MARKINGS. 3RD EXC. BUCKET UNCOVERS A RUSTED 55 GAL. DRUM CARCASS (0.0ppm PID & FID). ALSO, A POSS. PIPE SCREW.				
2'		STOP EXC. TEMPORARILY. 0-1' - SILTY SAND & GRAVEL FILL - SIMILAR TO 2-3', 5'-6' - BROWN, DAMP. FILL SILTY SAND & GRAVEL - F-C SAND, F+C GRAVEL, SUBROUNDED, WELL GRADED, BROWN, DAMP	ALL FILL	DA-S-TP15-0001 @ 1000 8/12/03	0	0
3'		RUBBER HOSE AT S. WALL - BLACK BOULDERS - > 3'				
4'		BRICK, CONCRETE SLABS 2-4' WIDE 3' LONG, WOOD DEBRIS, METAL PIPE ~4' LONG - 3" DIAM; NAILS, WIRE. RUBBER ? HOSE AT SOUTH END (WALL) BLACK		DA-S-TP15-0203 @ 0950 8/12/03	0	0
5'-6'	FILL	MASSIVE CONCRETE SLAB 5'-6' WIDTH AT BOTTOM - CAN'T BYPASS - SIDEWALLS COLLAPSING - SILTY SAND & GRAVEL - F-C SAND, WELL GRADED, BROWN, DAMP SUBROUNDED TO SUBANGULAR TO 4"	GM	DA-S-TP15-0506 @ 0940 8/12/03	0	0

TEST PIT CROSS SECTION AND / OR PLAN VIEW



Water Level Depth: NOT ENCOUNTERED

Pit Dimensions: Length: 10' Width: ~5'-6' Depth: 5-6'

Equipment Used: TAKEUCHI EXC. TB175

REMARKS: CRUSHED DRUMS WERE EMPTY - NO FLUIDS OBSERVED
NO VISIBLY STAINED SOILS. ALL FILL MATERIAL

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: D16. PHOTOS - NORTH, SOUTH, WEST WALLS - CAN'T GET PHOTO OF EAST WALL - UNSAFE TO ACCESS

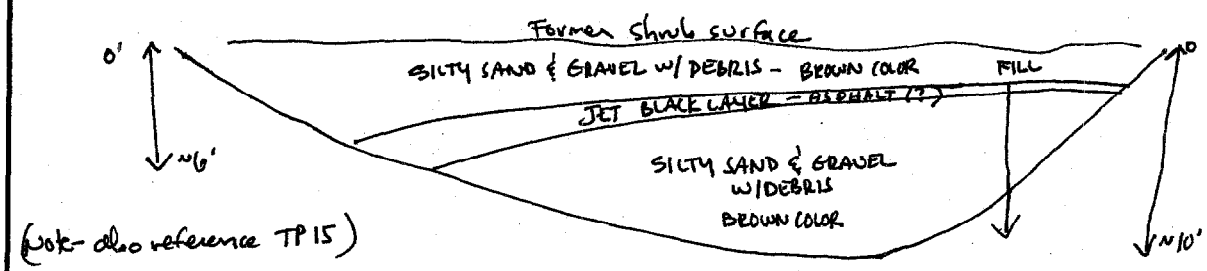
TEST PIT LOG

Tetra Tech NUS, Inc.

PROJECT NAME: NUSC Disposal Area SA-08
PROJECT NUMBER: N8856-0530
LOCATION: Newport, RI
TEST PIT No.: TP 15A
DATE: 8-12-03
TtNUS Representative: K Jalkut

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION: Soil/Waste Characteristics (lithology, density, color, moisture, etc.)	USCS	Remarks/ Sample ID and Time	PID/FID READING: Source (ppm)	PID/FID READING: BZ (ppm)
0		Former Shrub surface - now cleared				
1 2 3	Silty Sand & Gravel Debris	SILTY SAND AND GRAVEL @ 8-12-03 - f/c sand, f+c gravel up to ~2.5 in, subrounded, subangular, brown, twisted metal debris concrete curb w/ rebar JET BLACK COLORED LAYER - MATERIAL MAY BE ASPHALT (?) - TBD	GM/ FILL	No sample for lab from 0-1' DA-S-TP15A-0203-01 (2-3') @ 1235 hr targeted soil above jet black material (was some black material in it)	Source - 0 HS 2-3' PID - 0 PID - 0	0
4 5 6	Jet black layer - ? asphalt?	- black layer on north wall at ~6' ~~thick on~~ west end; 3' ~~thick on~~ east end @ 8-12-03 (i.e. depth)	Black Layer	DA-S-TP15A-0506-01 (5-6') @ 1445 hr	Source = 0 HS (5-6') PID - 0 PID - 0	0
7 8	Silty, Sand & Gravel w/ debris	SILTY SAND AND GRAVEL - Similar to material from 0 to ~3' - Brown coloration	GM/ Fill		Source - 0	0
9 10		- Construction debris, more metal EOP @ ~10' - hole collapsing		DA-S-TP15A-0910-01 (9-10') @ 1435 hr	Source - 0 HS 9-10' PID - 0 PID - 0	0

TEST PIT CROSS SECTION AND / OR PLAN VIEW



(Note - also reference TP 15)

Water Level Depth: Not encountered

Pit Dimensions: Length: ~15' Width: ~4-6' Depth: ~6' (west end, ~10' east end) Equipment Used: Takeuchi TB 175 excavator (small)

REMARKS: Likely all fill material. Test pit excavated perpendicular to TP15 - at RIDEM's request + Navy approval based on signals from RIDEM's metal detector

Note: Draw stratification lines at the approximate boundary between soil types for this test pit and show depths.

PHOTO LOG: Not Prior to excavation - north, west, east walls only - access too difficult to shoot South wall

Note - Targeted soil above jet black layer for sample analysis per RIDEM request + Navy approval (K. Manley). Collected sample of jet-black colored material at RIDEM's request + Navy approval (K. Manley / Ritchie Muchado ?). Also collected sample of jet black material for P. Kulpa - RIDEM - sample to be released when TtNUS results avail. for Navy. Sample being held in sample refrigerator @ K. Manley office until release to P. Kulpa.

B2 – BORING LOGS

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N1 8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: VJ
ELEVATION FROM:

BORING NO.: SB01
START DATE: 8-19-03
COMPLETION: DATE: 8-19-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0			No sample 0-1' due to asphalt + road base nature				ASPHALT SURFACE = 6IN		USED DEDICATED BIT TO PENETRATE ASPHALT.	
1				Fill soils likely	LOOSE	BROWN	GRAVEL-SAND-SILT MIXTURE. (F-C SAND, WELL GRADED, F+C (1/2-3/4") ANG. GRAV., ROCK FRAGS)	GM	ROAD BASE FILL 6-12IN BGS	
2			DA-S-SB01-0102-01 (1-2') 8-19-03 @ 0840 hrs				SILTY GRAVEL-SOME SAND. (F-C SAND, WELL GRADED F+C (1/2-1") SUBANG. GRAVEL)	GM	LESS SAND THAN 0.5-1' MORE ROADBASE 1-2' (?)	MAX FID = 74.9 ppm @ 2' (clamp) HS (FID) 1-2' = 50.1 ppm
3		3'/5'		Silts / Sands / Gravels	DENSE	GRAY BROWN	SILT - TR. FINE SAND (OXIDIZED SAND INTERVALS)	ML	WET @ 2' (LOCKED IN FINES)	FID SCAN = 2.4 ppm 2-3'
							SAND-SOME SILT-TR. GRAVEL. (Fine sand, poorly graded, fine (<1/2") subang. gravel - more oxidized zones; no visible bedding	SP	DRY @ 2.5' Possibly native soils	HS (FID) 2-3' = 145.1 ppm
4					?	?	?	?	POOR/PARTIAL RECOVERY - SOIL MAY HAVE COMPRESSED IN THE ACETATE SLEEVE	NO FID READINGS 3-5' (no material recovered)
5										
6			DA-S-SB01-5575-01 (5.5-7.5') 8-19-03 @ 0915 hrs MS/MSD		Dense	Brown	GRAVEL - SOME SAND - SOME SILT (C.C. subang. gravel to 1 1/4 in, tr. f. gravel, SR <1 1/2", f-c sand, well graded, SIH, dk phyllite fragment	GM	Dry to 7.5'	FID scan 5.5-7.5 = 0ppm HS = 2.3 (FID) ppm
7										
8					Dense	Gray Brown	SILT, possibly clay-sized particles	ML	wetness due to fines (?)	FID scan = 0ppm HS 7.5-8' = 0ppm (FID)

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Can't tell due to wetness associated w/ fines
OTHER OBSERVATIONS: No PID available - malfunction occurred 8/18/03 - requested replacement anticipate delivery by late AM.

Pay Items - 3 sleeves to 14'

Tetra Tech NUS, Inc.

BORING NO.: SB01

PAGE: 1 OF 2

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N1 8886
LOGGED BY: K. Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: DY
ELEVATION FROM:

BORING NO.: SB01
START DATE: 8-19-03
COMPLETION: DATE: 8-19-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET) 8	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
9		5'/5'	DA-S-SB01-0809-01 (8-9') 8-19-03 @ 0950hrs	Silt	Dense	Gray Brown	SILT, possibly clay-sized particles	ML	wetness due to fines (?)	FID scan 8-9' = 6.4ppm; HS (8-9') = 18ppm (FID)
10			No samples for lab 9-11'	Till	Dense	Brown	GRAVEL - SOME SAND - SOME SILT (f-c gravel, angular, f-c sand, well graded, silt, rock frags)	GM	Possible till - oxidized, unsorted	FID scan 9-11' = 0ppm (FID); HS = 0ppm w/FID 9-11'
11										
12		4'/5'	No samples for lab 11-14'	Rock	Loose	Gray	Phyllite - weathered bedrock crumbles w/finger pressure	Bedrock	Possible bedrock surface	FID scan 11-14' = 0ppm (FID); HS = 0ppm (FID) 11-14'
13										
14							EOB @ ~14' bgs (refusal w/DPT) Backfill w/cuttings, followed by bent. chips + sand, patch asphalt			

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous - macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Can't tell due to wetness associated w/fines
OTHER OBSERVATIONS: See p. 1 of 2

Tetra Tech NUS, Inc.

BORING NO.: SB01

Tinus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: VJ
ELEVATION FROM:

BORING NO.: SB02
START DATE: 8-18-03
COMPLETION: DATE: 8-18-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0			No samples for lab 0-1' due to asphalt/roadbase nature	Fill material	—	Black	Asphalt surface ~6in	Fill		
1					Loose	Brown (DK)	Roadbase material - granular asphalt, sand, gravel, silt	Fill		
2		4.5'/5'	DA-S-SB02-0102-01 8-18-03 @ 1430 hrs (1-2')	Silts + Sands	Dense	Brown	SILTY SAND (f-m sand, poorly graded, organic roots	SM	Dry. Possibly native soil below 1' (?)	FID/PID scans=0ppm FID HS=209.5ppm PID HS=0 PPM
3					Dense	Brown	SAND - SOME SILT - TR. GRAVEL (f-m sand, poorly graded, coarse gravel to 3/4in diam., subangular)	SM	Dry.	
4			DA-S-SB02-0304-01 8-18-03 @ 1455 hr (3-4')				- oxidized intervals (sand)			FID scan=13.4ppm PID scan=0ppm FID HS=17.3ppm PID HS=0ppm
5					?	?	- less silt, more oxidized intervals ? (assume similar to above)	SP ?	Partial recovery - possibly compressed soil	
6			DA-S-SB02-5565-01 8-18-03 @ 1505 hrs (5.5-6.5')		Dense	Brown	- Similar to material from 2-4.5' (much less silt)	SP	Dry.	FID scan=110ppm PID scan=0ppm FID HS=35.6ppm PID HS=0ppm
7				Till Layer (?) ~7.5'	Dense	Brown	GRAVEL - SOME SAND - SOME SILT (F+C arg, grav. up to 1.5" diam, f-c sand, well graded, silt)	GM	Possible start of till @ 6.5'. Dry.	FID/PID scan + HS=0ppm
8					Loose	Gray	Phyllite - weathered bedrock (crumbles w/ finger pressure)	Bedrock	Bedrock @ ~8' 7.5 Dry. by 8-18-03	FID/PID scan =0ppm No headspace

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Dry to refusal (water in rock unit not encountered)
OTHER OBSERVATIONS: No man-made debris viewed

Pay items - 2 sleeves to 8.5'

Tetra Tech NUS, Inc.

BORING NO.: SB02

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N 8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: VJ
ELEVATION FROM:

BORING NO.: SB02
START DATE: 8-18-03
COMPLETION: DATE: 8-18-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET) 8	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
		3.5'/3.5'	NO samples for lab	Rock	Loose	Gray	Phyllite - similar to above	Bedrock	Dry. Bedrock @ 8' continues	
8.5									No headspace 8-8.5'	
							EOB @ 8.5'. Refusal w/ DPT			
							Backfill using cuttings, then additional bent. chips / sand patch asphalt			

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Dry to 8.5' (water in rock unit - not encountered)
OTHER OBSERVATIONS: No man-made debris viewed

Tetra Tech NUS, Inc.

BORING NO.: SB02

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: VY
ELEVATION FROM:

BORING NO.: SB03
START DATE: 8-19-03
COMPLETION: DATE: 8-19-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0			No sample 0-1 due to asphalt + road base			Black	Asphalt surface			
1				Fill	Loose	Tan-Brown	Mix of sand, silt, gravels, weathered rock frags (w/oxidized surfaces) = Road base material	Fill	Dry. Road base.	
2			DA-S-SB03-0102-01 8-19-03 1040 hrs (1-2')		Loose-Med Dense	Brown	SAND - SOME SILT - SOME GRAVEL (f-m sand, poorly graded, fine subrounded to sub angular gravel to 1/2 in, rock chips	SP / Fill	Still likely roadbase material or other fill. Slight petroleum odor	FID scan = 56.7 ppm 1-2' HS (FID) 1-2' = 572.3 ppm
3		4'/5'		SAND-SILT MIX	Dense	Dk brown to orange brown	SANDY SILT (f. sand, poorly graded w/ oxidized intervals)	SM	Possibly native soil @ ~2.5'. Dry	HS (FID) 2-3' = 28.2 ppm
4			DA-S-SB03-0304-01 8-19-03 1045 hrs (3-4')	SILT	Dense	Gray-Black	SILT - much less f. sand than above	ML	Dry.	FID scan = 38.4 ppm (3-4') FID HS = 345.7 PPM (3-4')
5					(?)	(?)	(?) Assume similar to above (?)		Compressed soils - partial recovery	
6					Dense	Gray-Black	SILT - similar to material (3.5-4') above	ML	Dry.	FID scan = 0 ppm 5-6' HS (FID) = 0 ppm 5-6'
7		4'/5'	DA-S-SB03-0607-01 8-19-03 1110 hrs (6-7')	SILT SAND MIX	Dense	Gray-Brown	SILT - SOME SAND - TR GRAVEL (f. sand, poorly graded, f. subrounded gravel to 1/4" (1 or 2 pieces)	SM-~~ML~~ KJ 8-19-03	No olfactory evidence of odors Dry.	FID scan = 162.2 ppm FID HS = 167.9 ppm 6-7'
8					Dense	Orange Brown	- oxidized intervals in the f. sand			FID scan = 0 ppm 7-8' FID HS = 0 ppm 7-8'

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Soil appears saturated @ ~10' bgs.
OTHER OBSERVATIONS: Note - No PID yet (waiting on delivery); no man-made debris observed

Bag items 3 sleeves to ~14'

Tetra Tech NUS, Inc.

BORING NO.: SB03

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: [illegible]
ELEVATION FROM:

BORING NO.: SB03
START DATE: 8-19-03
COMPLETION: DATE: 8-19-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
8			No samples for lab	Till	Dense to v. Dense	Brown	SAND AND GRAVEL - SOME SILT (f-c sand, well graded, fine angular gravel to 1/2 in, c. gravel (ang.) to 1", silt, mixture - all unsorted	GM	Possible till - all unsorted weathered rock frags. Dry.	FID scan = 0ppm 8-9'
9										FID HS = 0ppm 8-9'
							- assume material continues (?)		Partial recovery - compressed soil	
10										
			No samples for lab				SAND AND GRAVEL - SOME SILT - similar material as at 8-9'		Till continues - Saturated @ 10'	FID scan = 0ppm 10-11'
11										FID HS = 0ppm 10-11'
							- More coarse angular gravel observed			FID scan 11-13.5' = 0 ppm
12							- more rock frags observed			FID HS 11-13.5' = 13.9ppm
		4' / 8" KJ 8-19-03					- no olfactory evidence of odors			
13										
				~13.5' Rock						
14					Dense	Gray to orange brown	BEDROCK CONTACT - Weathered, oxidized, crumbly metamorphic rock - appears to be phyllite	Rock	Rock @ ~13.5' Rock crumbles w/ finger pressure	FID scan 13.5-14' = 0ppm
		KJ 8-19-03	KJ 8-19-03						Partial recovery to 14' - Refusal w/ DPT @ ~14'	FID HS on rock = 0 ppm
15							EOB @ 14' - backfill w/ cuttings, bent. chips, sand. Repair asphalt surface w/ cold patch.			
16										

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Soil appears saturated at ~10' bgs.
OTHER OBSERVATIONS: Note - No PID yet (awaiting delivery)

Tetra Tech NUS, Inc.

BORING NO.: SB03

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: VV
ELEVATION FROM:

BORING NO.: SB04
START DATE: 8-18-03
COMPLETION: DATE: 8-18-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0							Asphalt surface			
			No sample for lab 0-1' - asphalt + roadbase mat.	Asphalt		Black		FILL	Use delicated bit to go thru asphalt	FID/PID scan = 0ppm
1					Loose	Brown	Roadbase = Mix of f-c sand, wg, f+c ang. gravel, silt, rock frags		- Dry. Roadbase material	
			DA-S-SB04-0102-01 (1-2') 8-18-03 1525 hrs	Fill Soils	Loose	Gray Brown	SAND AND GRAVEL - SOME SILT (similar to above w/ang. + subang. gravel)	GM	Possible continuation of roadbase (?)	PID/FID HS = 0ppm
2										PID/FID scan = 0ppm
		3.5'/5'	DA-S-SB04-2535-01 (2.5-3.5') 8-18-03 1530 hrs							
3					Dense		SANDY SILT	SM	Possibly native soil Strong olfactory	PID Malfunction FID HS = 1021 ppm 2-3'
				Silts			SILTY SAND		evidence of petroleum odors - visible sheen	FID scan = 238.8 FID HS = 222.6 ppm
4				Sand	?		?		Compressed soils - partial recovery only	
				&						
5				Gravels						
					Dense	Gray Brown	SILT - TR GRAVEL	GM	Petro odors + sheen (olfactory evidence)	NO FID/PID
6									Wet - possible @ 5-6'	
		5.4'/5'			Dense	Gray Brown	GRAVEL - SOME SILT - SOME SAND (f-m sand, poorly graded, f+c ang grav. to 1" rock frags)	GM	Till like w/exception of pg sands (?) Just coarse layer?	
7	8/8/8						- similar to above w/ f-c sand			
8							SAND - f/c sand, well graded	SW	Strong petro odor - visible sheen	

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Water possible @ 5-6' interval
OTHER OBSERVATIONS: Heavy rain today. PID malfunctioned briefly. No FID/PID readings ~5-9' (raining heavily). No man-made debris observed

Pay items 3 sleeves to 13'

Tetra Tech NUS, Inc.

BORING NO.: SB04

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB04
START DATE: 8-18-03
COMPLETION: DATE: 8-18-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
8				Silt	Soft	Brown	SILT	ML	Fines holding water	
9										
10			DA-S-SB04-0910-01 (9-10') 8-18-03 1600 hr DUP06@ 1615 hr	Sand	Loose	Brown	SAND - SOME SILT (f-m sand, poorly graded)	SM	Heavy rain still falling - check accuracy of readings Petro sheen + odors	NO FID/PID Scan FID HS = 237 PID HS = 337
11	8-18-03		DA-S-~~SB04~~ SB-DUP06-01	Silt	Dense	Gray to orange brown	SAND - SOME GRAVEL (f-c sand, well graded, f+c subrounded gravel to 1")	SW ~~SP~~/GPW	Petro odor + sheen	No more FID/PID readings due to rain
					Dense	Gray Brown	SILT			
12		3'/3'		Till?	Dense	Brown-Gray to orange brown	GRAVEL - SAND - SILT MIXTURE (unsorted, dense, f-c sand, well graded, f+c angular gravel 1/2-1" rock frag)	GM	Likely top of till unit	
13				Rock						
14					Dense	Gray-Black	Bedrock contact @ ~13' - weathered phyllite w/ oxidized intervals. Crumbles w/ finger pressure	Rock	Rock @ ~13' bgs Refusal w/ DPT @ ~13'	
15									Backfill w/ cuttings bent. chips, sand, patch asphalt	
16										

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Possible ▽ @ 5-6' bgs
OTHER OBSERVATIONS: Suspect conc. of FID/PID readings given rain. Odors were detectable (petroleum).

Tetra Tech NUS, Inc.

BORING NO.: SB04

Tnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N 8856
LOGGED BY: K Jolkut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: W
ELEVATION FROM:

BORING NO.: SB05
START DATE: 8-19-03
COMPLETION: DATE: 8-19-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0							Asphalt = 3in = black surface			
					Loose	Brown	Roadbase = 3in = mix gravel, sand, silt, rock frags		Dry.	
1				Fill Soils + debris	Loose	Brown	SAND - SOME GRAVEL - TR SILT (f-c sand, well graded, f-c subrounded - subang. gravel to 1", charcoal-like material	SP/Fill		FID/PID scan = 0ppm
			DA-S-SB05-0102-01 8-19-03 1500 hr (1-2')						Frothy charcoal like pieces - almost pumice like fill	FID/PID HS = 0ppm
2									Dry	
		4'/5'	DA-S-SB05-0203-01 8-19-03 1530 hr (2-3')	BOULDER	Loose/Broken	Gray	BOULDER - weathered phyllite - crumbly		Boulder 2-2.7'	
3					Denser than above	Brown Gray	GRAVEL - SOME SAND (similar to 0.5-1' w/ more gravel) + rock frags	GP/FILL	PID HS = 5.7ppm	FID/PID scan = 0ppm FID HS = 5.7ppm
			DA-S-SB05-0304-01 8-19-03 1600 hr (3-4')						Dry FID HS = 2.5ppm	NO FID/PID scan PID HS = 9.7ppm (3-4')
4				Fill Soils + debris			- clinker material observed			
					?	?	? (Assume similar to above ?)		Partial recovery - compressed soils	
5							GRAVEL - SOME SAND - similar to 2.7'-4' w/ fill	GP/FILL	Dry.	FID/PID scan = 0 FID/PID HS = 0
				~5.5'	Loose	Light Gray	Bedrock contact @ 5.5' - weathered phyllite - crumbles w/ finger pressure		Rock @ ~5.5' bgs	(5-5.5')
6		2.5'/3'								
7										
8							EOB @ ~8' bgs - backfill w/ cuttings, bent chips, sand, patch asphalt			

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous - macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Below rock
OTHER OBSERVATIONS: Fill materials observed to ~5.5' bgs - on top of shallow rock

Pay items - 2 sleeves to 8'

BORING NO.: SB05

Tetra Tech NUS, Inc.

PAGE: 1 OF 1

Tnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N 8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: KJ
ELEVATION FROM:

BORING NO.: SB06 ~~MW05~~ (DPT)
START DATE: 8-18-03
COMPLETION: DATE: 8-18-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0							Asphalt - 6"			
			No sample 0-0.15' (asphalt)						Asphalt surface	
1			DA-S-~~MW05~~ SB06-0515-01	SILTY GRAVEL	loose	brown	SILTY GRAVEL - SOME SAND - f. subrounded gravel up to 1/2"; silt - f/c sand, well graded	GM -	Damp. Partial road base material (?)	HS - 0.5-1.5' FID/PID = 0
			(0.5-1.5') @ 1340hr					FILL	Source = 0 ppm (FID/PID)	
2				SILT-SAND	dense	dk brown	SILT - SOME SAND - TR. GRAVEL - f. sand, poorly graded - c. gravel to 3/4" - subround./subang.	SM -	Damp. Source = 0 ppm (FID/PID)	HS = 1.5-2.5' FID/PID = 0
		3.5'/5'		11-8-11-03				FILL		
3			DA-S-~~MW05~~ SB06-2535-01	~~2.5~~ SANDY SILT		brown	SANDY SILT - TR. GRAVEL - f. sand, poorly graded - f. gravel to 1/2" - subang./subround.	SM-ML	Dry. Source = 0 ppm, (FID/PID)	HS = 2.5-3.5' FID = ~~0~~ 19.3 PID = ~~19.3~~ 0
			(2.5-3.5') @ 1400hr					~~FILL?~~		
4				ROCK STARTS 3.5'		gray	POT: BEDROCK @ 3.5' - appears to be weathered phyllite - not much in sleeve	ROCK	Source = 0 ppm, FID/PID	NO HS reading @ 3.5'
					?	?	(assumption)	?	Partial recovery - possibly due to compression	
5										
					dense	gray	BEDROCK - METAMORPHIC - PHYLLITE OR SLATE - - v. slight shine on cleavage surfaces - fissile (breaks on bedding planes) - weathered/altered - crumbles w/ finger pressure	ROCK	Appears dry Source = 0 ppm, FID/PID	HS = 5-6' FID - 22.6 PID - 0
6										
		2'/2.5'								
7										
							End of boring @ 7.5' - refusal w/ sleeve. Backfill w/ cuttings, bent chips, sand, patch asphalt. No well installed at DPT location			
8										

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous - macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Not encountered. Silt + rock layers appear dry - below rock (?)
OTHER OBSERVATIONS: Location in "secure storage area" - rear grid pt F30 - hit via soil gas for TPH compounds

[Pay items 2 sleeves 7.5' TP]

Tetra Tech NUS, Inc.

BORING NO.: MW05

PAGE: 1 OF 1

Note: HS = Jar headspace reading. Used dedicated bit through asphalt.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N 8856
LOGGED BY: K. Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: KJ
ELEVATION FROM:

BORING NO.: 2 1/24/03 MW07 SB07
START DATE: 8-18-03
COMPLETION: DATE: 8-18-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0							Grass surface			
			DA-S- ~~MW07~~ SB07 -0102-01 8-18-03 1220 hrs (1-2')	Silt Sand Gravel	Loose	Dk brown	Root mat: 0-0.2' SILTY SAND - TR. GRAVEL (f-m sand, poorly graded,	SM	Damp top soil possibly native soil over rock	FID/PID scan = 0
1							f. gravel to 1/4 in, subangular			FID HS = 0 PID HS = 0
				cobble			- Similar to above w/ 1 interval of black, fissile, weathered, phyllite cobble		Dry.	
2				~2'						
		4.75'/5'	No samples for lab		Loose	Gray Brown	Bedrock contact @ ~2' - weathered phyllite, crumbles w/ finger pressure	Rock	Dry. Rock @ ~2'	
3										
							- so weathered, resembles f-c sand			
4										
5					?	?	? - (assume similar to above)		compressed soil/weathered rock - partial recovery	
		5'/5'			Loose	Gray Brown	Bedrock continues @ 5'-10' weathered phyllite		Xtra sleeve for rock confirmation	
6										
7										
8										

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Below rock.
OTHER OBSERVATIONS: No man-made debris observed

Pay items 2 sleeves to 10'

BORING NO.: MW07 (DPT)

Tetra Tech NUS, Inc.

PAGE: 1 OF 2

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N 8856
LOGGED BY: K Jolkut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Low
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: [illegible]
ELEVATION FROM:

BORING NO.: ~~MW07~~ 9 SB07
START DATE: 8-18-03
COMPLETION: DATE: 8-18-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
8			No samples for lab	Rock	Loose	Gray Brown	Weathered phyllite - crumbly			
9										
10							End of boring @ 10' - backfill w/ bent chips + sand. No well installed at DPT location			
11										
12										
13										
14										
15										
16										

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Below rock
OTHER OBSERVATIONS: No man-made debris observed.

BORING NO.: MW07 (DPT)

Tetra Tech NUS, Inc.

PAGE: 2 OF 2

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N1 8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: VJ
ELEVATION FROM:

BORING NO.: SB08 ~~MW02~~ (DPT)
START DATE: 8-19-03
COMPLETION: DATE: 8-19-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0							Asphalt surface = 3in			
			No sample 0-1' due to roadbase material		Loose	Gray-brown	Roadbase material - gravel, sand, silt asphalt (3 in)			
1					Loose	Red-Brown	SAND - SOME GRAVEL	SW		
			DA-S-~~MW02~~ SB08-0102-01 (1-2') @ 1645 hr	Rock. Fill soils			- f/c sand, well graded - coarse, subrounded gravel to 3/4 in	Fill	Source = 0 w/ FID+PID (0.5-2')	HS 1-2' FID - 0
2										PID - 0
		3.5'/5'			Dense	brown	SILTY SAND - SOME GRAVEL. Mostly f-c sand, well graded, silt, c. gravel to 1" - subrounded/subangular	SM-GM Fill	Damp (fines?) Source = 0ppm (2-3.8')	HS 2-2.7' FID - 9.7
3					Soft	brown	SANDY SILT - mostly silt, f. sand, poorly graded	SM-ML ~~Fill (?)~~	wet (fines?) Possibly native @ 3'	PID - 0
4				Sandy Silt Native?	?	?	(?)	?	Partial recovery - Soil may have compressed in the acetate sleeve.	
5										
6					Soft	brown	SANDY SILT - Mostly silt, f. sand. poorly graded	SM-ML ~~Fill (?)~~	Source = 0 ppm (5-6') FID+PID	HS 5-6' FID - 5.6 PID - 0
		4'/4'	DA-S-~~MW02~~ SB08-0607-01 (6-7') @ 1700 DA-S-MW-DUP07-01 (6-7') Duplicate	Till-like	dense	brown-red brn	SANDY GRAVEL - SOME SILT. F-c angular gravel to 1.5in, f/c sand, well graded, silt, unsorted	GM-Natural	Till-like; dry Source = 0 FID/PID 6-7' ~~Possibly native @ 6'~~	HS 6-7' FID - 2.5 PID - 0
7				Rock @ 7'	dense	light gray	PHYLLITE - BEDROCK - WEATHERED - crumbles w/ finger pressure; metamorphic - slight sheen to "cleavage" surfaces - fissile; platy minerals aligned	ROCK	Bedrock Source = 0 7-9' FID/PID	HS 7-9' FID - 0
8										PID - 0

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Possibly @ shallow depth - ~4' (not sure if moisture content due to fines) Till/Rock appeared dry 6-9' bgs. (?)
OTHER OBSERVATIONS: Borehole location in "paved area" - end closest to Area 185 structures Near GH350/GH400 grid points. Note - HS = Jar Headspace readings

Pay Items [2 sleeves 9 ft TD]

Tetra Tech NUS, Inc.

BORING NO.: MW02

PAGE: 1 OF 2

Tinus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N 8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB08e MW02 (DPT)
START DATE: 8-19-03
COMPLETION: DATE: 8-19-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
8			no samples for lab analysis	Rock	dense	light gray	Bedrock - Similar to description 7-8'	Rock	Bedrock; dry	See p. 182
9										
							END OF DPT BORING @ 9' - REFUSAL w/ DPT			
							Backfill w/ bent. chips and cuttings patch asphalt. No well installed at DPT boring. Returned + installed a mont. well in a boring adjacent to DPT hole			

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Possibly @ shallow depth - not sure if moisture content due to fines; Till/Rock appeared dry from 6-9' bgs (?)
OTHER OBSERVATIONS: Borehole location in "Paved Area" - end closest to Area 185 structures Near GH 350/GH400 grid points. Note - HS = Jar headspace readings

BORING NO.: MW02

Tetra Tech NUS, Inc.

PAGE: 2 OF 2

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N8856
LOGGED BY: K Jolkut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: VJ
ELEVATION FROM:

BORING NO.: SB-09 MW01 (DPT)
START DATE: 8-19-03
COMPLETION: DATE: 8-19-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0							Former shrub/grass surface - now cleared			
			No samples for lab analysis		loose	brown	SILTY SAND - Mostly f-m sand, poorly graded, silt, organic roots, twigs	SM/FILL	Damp Topsoil/Rootmat	HS 0-0.5' PID 22.3 FID 5.7
1				Fill Soil + debris			- yellow+red bricks + concrete (0.5-1.3')		Source Scan = 0ppm FID/PID	HS 0.5-1.3' FID-0 PID-5.2
							- no visible debris (1.3-1.7')		(0-1.5')	HS 1.3-1.7' PID-2.6 PID-2.1
2							CONSTRUCTION DEBRIS/WEATHERED PHYLLITE		- Broken rock pieces	
		3'/5'				14 8-19-03	- Asphalt, tiles, unidentified green material (1.7-2.5')		Note - Acetate sleeve intact upon retrieval	HS 1.7-2.5' FID-17.8 PID-12.5
3							- Concrete (2.5-3')		Source Scan = 0ppm FID/PID (1.5-3')	HS 2.5-3 FID-17.3 PID-9.3
								?	Note - Partial recovery - Soil may have compressed - Size/nature of debris may have precluded recovery	
4				?			?			
5										
				Till-like	dense	brown-orange brn.	SAND AND GRAVEL - SOME SILT	GM	TILL (?)	
6							- F/C sand, well graded, silt, f&c angular gravel 1/4-1.5in		Source scan = 0ppm FID/PID	10-8-19-03 HS ~~5-8'~~ 5-8.8' FID-0
		3.8'/5'					- Appears to be unsorted mixture		Possibly native soil @ 5 ft bgs.	PID-0
7							- No debris visible (5-10')			
8										

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Not encountered
OTHER OBSERVATIONS: Borehole location in vicinity of TP02 Near E400 grid point

[3 spoons (sleeves) 13' TD] (pay items)

Note: HS = Jar headspace readings

BORING NO.: MW01

Tetra Tech NUS, Inc.

PAGE: 1 OF 2

Tinus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB-10 MW06 (DPT)
START DATE: 8-19-03
COMPLETION: DATE: 8-19-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0							Former shrub area - cleared			
			No samples for lab analysis		loose	brown	SILTY SAND - SOME GRAVEL	SM	Topsoil, damp.	
1							- mostly f. sand, poorly graded - coarse subround gravel to 3/4" - 1 piece phyllite to 1in - black		(0-1') Source = 0 FID 0 PID	HS: 0-3' PID-0 FID-0
					dense	brown	- f/m sand visible; still poorly graded	SM/GM	(1-2') Source = 0 FID 0 PID	
2				Fill Soils			- c. gravel to 1.25 in - subround/subang. (more gravel than above)			
		3'/5'					- more silt than above		(2-3') Source = 0 FID 0 PID	
3					dense	brown	- silt % increases (not sandy silt)		Damp to v. damp. (Fines ?)	
								?	Note - partial recovery. No debris - soil may have compressed in acetate sleeve.	
4				(?)	?	?	?			
5										
					dense	brown	SAND AND GRAVEL - SOME SILT	GM	Dry. Source = 0 ppm FID/PID	HS 5-8.2 FID-0 PID-0
6							- f/m sand, poorly graded			
		3.2'/5'					- f-c gravel, subrounded-subangular to 1"			
7						orange brown to brown	- oxidized interval (2in) - iron oxidation ?			
							- possibly clay-sized particles w/ shake test (material stays in suspension)			
8							- increased % of gravel - subangular			

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous - macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Not encountered - possibly below rock (?)
OTHER OBSERVATIONS: Location in vicinity of TP08 - near grid pt D500

[Pay items: 3 sleeves, 13' TD]

BORING NO.: MW06

Tetra Tech NUS, Inc.

PAGE: 1 OF 2

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB-10
START DATE: MW06 (DPT)
COMPLETION: DATE: 8-19-03
MON. WELL NO.: 8-19-03
CHECKED BY: N/A

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
8		(See page 1)	No samples for lab analysis				8-8.2' - similar to soil 5-8'		Source = 0ppm	
9				?	?	?		?	Note - partial recovery - possibly due to soil	
									Compression or gravels (?) Acetate sleeve intact.	
10				Fill/soil/debris						
					—	—	DEBRIS & WEATHERED ROCK FRAGS - concrete / phyllite fragments	Fill		HS: 10-10.5 FID/PID = 0
11					dense	brown	SAND AND GRAVEL - SOME SILT	GM	Source = 0ppm FID/PID	HS 10.5-11.5 FID/PID = 0
		2.2'/3'					- similar to soil @ 5' - angular gravel to 1"; clinkers (?) - debris	Fill	Clinkers = coal-like material (almost like charcoal briquette)	
12				Rock @ 11.5'		gray-blk to gray brown to orange-brown	BEDROCK - WEATHERED/ALTERED - phyllite (oxidized portions) / fissile.	Rock	Source = 0 ppm FID/PID	HS 11.5-12.5 FID/PID = 0
13							(assumption)	?	Note - partial recovery; per driller - refusal w/ sleeve @ 13' - bedrock.	
							END OF BORING @ 13' - Refusal		Did not recover material 12.2-13 ft bgs.	
							- Backfill w/ bent. chips and sand - No well installed @ DPT location			

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous - macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Not encountered - possibly below rock
OTHER OBSERVATIONS: Location in vicinity of TP08 - near grid pt B500

BORING NO.: MW06

Tetra Tech NUS, Inc.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08
PROJECT NO.: N 8856
LOGGED BY: K Jolkut
DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: KJ
ELEVATION FROM:

BORING NO.: SB-11 / MW08
START DATE: 8-18-03
COMPLETION: DATE: 8-18-03
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET) 0	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
							Grass surface. Root mat 0-0.4'			
1			No samples for lab -	Silts Sands + Gravels	Loose	Brown	SILTY SAND - SOME GRAVEL (f-c sand, well graded, f-c subrounded gravel to 1") roots	SM	Organic topsoil. Dry. Likely native soils	FID/PID scan = 0ppm
2		5'/5'								FID HS = 0 PID HS = 0
3					Loose m. Dense		SAND AND GRAVEL - SOME SILT (f-c sand, well graded, f. gravel to ½" subrnd, less silt than above, more gravel.	GM	Dry.	FID/PID scan = 0 FID HS = 0 PID HS = 0
4										
5				Rock @ 4.4'	Loose	Gray Black	Bedrock - weathered, broken, crumbly rock - phyllite (?) or slate (?) Fissile - resembles circular chips	Rock	Very degraded!	FID/PID scan = 0 FID HS = 0 PID HS = 0
6										
7		4'/5'								No additional HS readings
8										

Misplaced original field copy

TYPE OF DRILLING RIG: GeoProbe 6610 DT
METHOD OF ADVANCING BORING: DPT
METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS: Below rock - not observed 0-15'
OTHER OBSERVATIONS: No samples for lab analysis due to proximity to TP13
No man-made debris encountered.

Pay items: 3 sleeves - 15'

BORING NO.: MW08

Tetra Tech NUS, Inc.

PAGE: 1 OF 2

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area SA-08

PROJECT NO.: N8856

LOGGED BY: K Jaikut

DRILLED BY (Company/Driller): GeoSearch/EDI - B. Law

GRD. SURFACE ELEVATION:

TRANSCRIBED BY:

ELEVATION FROM:

BORING NO.: SB-11 / MW08

START DATE: 8-18-03

COMPLETION: DATE: 8-18-03

MON. WELL NO.: N/A

CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
8			No samples for lab		Loose	Gray	Weathered rock - phyllite			
9										
10							Assume similar rock type as above		Partial recovery 5-10' - compressed, degraded rock.	
11							Weathered phyllite continues - v. broken rock			
12		4'/5'					- minimal evidence of oxidized surfaces (orange-like)			
13										
14										
15							Assumption		Partial recovery 10-15'	
16							EOB @ 15' - Backfill w/rock chips, soil, bent chips, sand. No well installed @ DPT location			

TYPE OF DRILLING RIG: GeoProbe 6610 DT

METHOD OF ADVANCING BORING: DPT

METHOD OF SOIL SAMPLING: Continuous-macro core system - 5' acetate sleeves

METHOD OF ROCK CORING: N/A

GROUNDWATER LEVELS: Below rock - not observed 0-15'

OTHER OBSERVATIONS: No samples for lab analysis due to proximity to TP13

BORING NO.: MW08

Tetra Tech NUS, Inc.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: DJ
ELEVATION FROM:

BORING NO.: MW01B
START DATE: 8-21-03
COMPLETION: DATE: 8-22-03
MON. WELL NO.: MW01B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0							Ground surface			
			No samples for analysis – location close to			Brown			4in casing	
1										
			TP02 from which soil samples were collected				Cuttings appear to be similar to			
2				Silts, Sand w/ debris		Gray-Brown	Silty SAND or Silt, Sand	SM		
3							– visible metal debris w/cuttings			
4										
5										
							– visible metal debris – strapping w/ cuttings pieces			
6										
7										
							– visible metal fragments w/ cuttings			
8										

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: NX wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS: Using roller bit to advance through soil to top of rock

4 1/4 ID augers
4in casing to 10'
Telescope 3in @ 10'–12'

BORING NO.: MW01 B

Tetra Tech NUS, Inc.

PAGE: 1 OF 5

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K. Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: VJ
ELEVATION FROM:

BORING NO.: MW01B
START DATE: 8-21-03
COMPLETION: DATE: 8-22-03
MON. WELL NO.: MW01B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
8			No soil samples for lab analysis	Silt, Sand		Gray-Brown	- Cuttings resemble silt + sand		4in casing	
9							- No visible debris in cuttings			
10										
11				ROCK@10'		Dark Gray	Bedrock Surface - Telescope 3in casing + advance to seat casing @ 12'		Significant color change - wash out hole + tub prior to advance thru rock	
12							casing (3in) seated			
END 8/21 START 8/22 13		CORE 1 2.7/3.5'	12-13' 2min 34sec		VERY BROKEN		SLATE / PHYLLITE • VERY WEATHERED. CRUMBLES W/FINGER PRESSURE • FISSILE. SOME SHINYNESS EVIDENT • POSSIBLE EVIDENCE OF CRENULATIONS ?		[CORE] PEN. = 3.5' RAN OUT OF STROKE REC. = 2.7' ROCK NO WATER LOSS C-1	
14			13-14' 2min 48sec				• MOST PIECES 1/4 IN THICK (CHIPS) • NO FRACTURES (DISTINCT) EVIDENT - ALL BROKEN ROCK		RQD (C1) = 0% 0IN/42" (NO PIECES > 4in)	
15			14-15' 1min 54sec				• EVIDENCE OF IRON STAINS ON 90% OF PIECES		- SUDDEN DROP W/ BARREL - SOFT ZONE (?)	
16		CORE 2	15-15.5' 43 sec; 15.5-16.5' 2min 43sec				SIMILAR ROCK AS IN CORE 1		LARGEST PIECES = 2IN (2 OF THEM)	

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: NONE
METHOD OF ROCK CORING: NX Wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS: USING SERIES 10 DIAMOND (MORE SUITABLE FOR DOLOMITE OR V. HARD ROCK VS. WEATHERED SHALE → PHYLLITE)

BORING NO.: MW01B

Tetra Tech NUS, Inc.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: VB
ELEVATION FROM:

BORING NO.: MW01B
START DATE: 8-21-03
COMPLETION: DATE: 8-22-03
MON. WELL NO.: MW01B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
16		CORE 2 (CONT.	15.5-16.5' - SEE P. 2		VERY BROKEN	GRAY - DK GRAY	SLATE/PHYLLITE - WEATHERED		CORE 2 PEN=5 FT REC=4.5 FT	
			16.5-17.5' = 2 MIN 34 SEC				• SIMILAR TO C-1			
17							• FISSILE - BREAKS ALONG BEDDING PLANES		NO WATER LOSS FOR C-2	
		4.5'/5'	17.5-18.5' = 2 MIN 28 SEC				• HIGHER % OF PIECES APPROX 1-2 IN THICK VS. 1/4 IN THICK IN CORE 1		RQD = 0% 0 IN (>4 IN length) / 60 IN	
18										
			18.5-19.5'				• IRON STAINS ON MAJORITY OF PIECES		LARGEST PIECE = 3 IN (1 PIECE)	
19							• NO DISTINCT COLOR CHANGE FROM CORE 1			
			= 2 MIN 15 SEC 19.5-20.5'							
20										
			= 2 MIN 4 SEC							
		CORE 3	20.5-21.5'		VERY BROKEN	GRAY - DK GRAY	SLATE/PHYLLITE - WEATHERED		CORE 3 PEN=5 FT REC=4.5 FT	
21										
			= 1 MIN 20 SEC 21.5-22.5'				• SIMILAR TO CORE 1 + CORE 2			
22							• FISSILE		RQD = 0% 0 IN (>4 in length) / 60 IN	
		4.5'/5'					• NEARLY HORIZONTAL BREAKS ALONG BEDDING PLANES - NO DISTINCT FRACTURES			
			= 1 MIN 52 SEC 22.5-23.5'				• LESS IRON STAINING THAN IN PREVIOUS RUNS		LARGEST PIECE = 3 IN (1 piece)	
23										
			= 2 MIN 24 SEC 23.5-24.5'				• ROCK CHIPS COMPLETELY DEGRADED 23-24' - MUSH-LIKE		POSSIBLE WATER ZONE BASED ON DEGRADATION OF ROCK	
24			= 3 MIN 44 SEC							

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: NX wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS: See p. 2

BORING NO.: MW01B

Tetra Tech NUS, Inc.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: VJ
ELEVATION FROM:

BORING NO.: MW01B
START DATE: 8-21-03
COMPLETION: DATE: 8-22-03
MON. WELL NO.: MW01B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
24		CORE 3 CONT	SEE PAGE 3		V. BROKEN	GRAY-DK GRAY	SLATE/PHYLLITE - SIMILAR TO PGS 1-3			
25			24.5-25.5'				• AT 25' - COMPLETELY DEGRADED ROCK ALMOST MUSH-LIKE		POSSIBLE WATER ZONE AT 25'	
			= 6 MIN 20 SEC (*)					*	WATER LOSS = 5 GALS 24.5-25.5'	
26		CORE 4	25.5-26.5'		V. BROKEN	DK GRAY	SLATE/PHYLLITE - SIMILAR TO RUNS 1-3 FOR ROCK TYPE		CLEAN OUT TUB PRIOR TO TOO MANY WEATHERED	CORE 4 RUN ROCK CHIPS
			= 4 MIN				- MINIMAL ±IRON STAINING (25.5-26.5') AT TOP		CORE 4 PEN = 4.5' REC = 3.5'	
27			26.5-27.5'						RQD = 0% (no pieces > 4 in L)	
		3.5'/4.5'	= 3 MIN				• NO OTHER ±IRON STAINS EVIDENT BELOW 26.5' TO END OF CORE 4 RUN		0 IN/54 IN	
28			27.5-28.5'						LARGEST PIECE = 2 IN length	
			= 5 MIN 5 SEC				= COMPLETELY DEGRADED @ 28'		POSSIBLE WATER ZONE @ 28' DUE TO DEGRADATION OF ROCK	
29			28.5-29.5'				• SOME VISIBLE LOW ANGLE FRACS - ~20° ALONG BEDDING		10-GALLON WATER LOSS	
			= 5 MIN 13 SEC				• PIECES POSSIBLY MORE COMPETENT 29-30' (LONGER BUT STILL LESS THAN 2 IN)		MORE COMPETENT ROCK AT END OF RUN	
			29.5-30.10							
30			9 MIN 22 SEC		LESS BROKEN		• ACTUAL MEASUREMENT @ 30' mark OR EQUAL TO = 29' 3" (confirmation of depth)		- DIFFICULT TO CORE - JAMMING - ABOVE COMPETENT PART	
		CORE 5	30-30.5 = 2 min 18 sec		MORE COMPETENT	LIGHT GRAY	SLATE/PHYLLITE - similar to RUNS 1-4 FOR ROCK TYPE		CORE 5: PEN = 5' REC = 5'	
31		5'/5'					• 2 pieces > 4 in length		RQD = 10 IN/60 IN x 100	
			30.5-31.5 = 2.5 min				• somewhat mottled coloration gray/white		= 16.6% OVERALL	
32							• Fissility is less pronounced in upper portion of core 5			

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: NX wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS: (*) LONG CORING TIME B/C WATER PRESSURE KEPT INCREASING - DRILLER POLLED UP DRILL STEM SEVERAL TIMES TO AVOID BLOWING HOSE. PRESSURE > 150 PSI

Tetra Tech NUS, Inc.

BORING NO.: MW01B

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY: VG
ELEVATION FROM:

BORING NO.: MW01B
START DATE: 8-21-03
COMPLETION: DATE: 8-22-03
MON. WELL NO.: MW01B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
32			31.5-32.5 = 3 MIN		MORE COMPETENT THAN ABOVE	LIGHT GRAY/WHT	SLATE/PHYLLITE		CORE 5 CONTINUED	
33							• Several pieces ~3in in length • Low angle breaks along bedding			
			32.5-33.5 = 3.5 min				• Limited iron stains @ 33-33.5' ± brown			
34							core pieces			
			33.5-34.5 = 4 MIN				• Pitted nature observed - open, irregular shaped pits in rock - weathered out mineral (?) 1/4-1/2 in diameter		Hit pits w/acid - no fizzing - not likely carbonate minerals (former)	
35							• Fissility more evident on pitted pieces than above - more degraded at lower end.			
			34.5-35.5 = 4.5 MIN						Some iron stains brown pitted pieces	
36		CORE 6			MUCH MORE COMPETENT THAN ABOVE	LIGHT GRAY TO WHITE	SLATE/PHYLLITE		CORE 6	
			35.5-36.5 = 2 MIN				• Pitted nature to rock from 35.5-36.5' • NO iron stains evident on degraded pitted pieces		PEN = 4.5' REC = 4.5' RQD = 37 IN/54 IN x 100 = 68.5%	
37		4.5'/4.5'								
			36.5-37.5 = 3 MIN				• Low angle to nearly horiz. break			
38							• Limited visible fissility - more competent than previous runs			
			37.5-38.5 = 3 MIN							
39							• 1 piece exhibits iron stains @ ~39'. Piece more degraded than above and has a high angle fracture w/ ~70°			
			38.5-39.5 = 3 MIN 20 SEC							
40			39.5-40' = 3 MIN				• ~~Back to more competent rock~~			
							END OF CORING AT ~40'. BOTTOM OF HOLE MEASUREMENT AT 39.9' (~40')			

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: NX Wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS: See p. 2. Set 1 1/4" well (OD). See well construction log

BORING NO.: MW01B

Tetra Tech NUS, Inc.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW02B
START DATE: 8-26-03
COMPLETION: DATE: 8-26-03
MON. WELL NO.: MW02B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0							Asphalt surface			
			No samples for lab analysis				- Roadbase ↓		Dedicated bit through asphalt used	
1						Brown Gray	Silt + Sand size cuttings			
2							- Advance 3in casing			
3										
4										
5										
6										
7				Rock @ ~6		Gray	Color change - Seat 3in casing 2' into weathered rock		Washout borehole + mud tub prior to coring into rock	
8										

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: NX Wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.: MW02B

Tetra Tech NUS, Inc.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW02B
START DATE: 8-26-03
COMPLETION: DATE: 8-26-03
MON. WELL NO.: MW02B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
8		CORE 1	8-9' = 1 min 54 sec	Slate to Phyllite	Weathered	Light Gray	SLATE/PHYLLITE		CORE 1 PEN = 3' REC = 2'	CORE 1 - 0ppm w/FID
9							• Sheen to rock surface but no visible crenulations		RQD = 0% - 0in/36in x 100 = 0%	0ppm w/PID
		2'/3'	9-10' = 2 min				• All surfaces exhibit iron stains		No pieces >4in length	
10							• 1/4-1/2 in thickness to weathered chips		- Grainy texture observed on pieces	
			10-11' = 46 secs				• Fissile - mostly all horiz. breaks along bedding planes		(cemented sand grains - possibly schist-like (?))	
11							• Pieces crumble easily w/ finger pressure		Lost ~5 gals @ 10'	
		CORE 2	11-12' = 2 min 30 sec				SLATE/PHYLLITE cont. - similar rock type as Core 1		CORE 2 Pen = 5' Rec = 5'	
12							• Fewer iron stains relative to Core 1			
			12-13' = 2 min 38 sec				• More low angle fractures (~25°)		Per driller - lost ~10 gals 12-16'.	
13										
		5'/5'	13-14' = 2 min 9 sec						RQD Core 2 = 4.5in/60in x 100 = 7.5%	
14							Picking up a granular texture on phyllite surface @ ~14'			
			14-15' = 3 min 46 sec	Quartz Schist (?) (Granular interval) PHYLLITE		Tan Brown	ROCK CHANGE TO QUARTZ SCHIST (?) - Grainy texture (metamorphosed sand interval ?)		(1 piece > 4in in run)	CORE 2 - 1.5 ppm w/FID
15							- High angle fractures on schist pieces			0ppm w/PID
			15-16' = 3 min 12 sec				- Lose sign of phyllite w/ granular texture			Checked inst. status - working ok
16						Light Gray	SLATE/PHYLLITE evident @ bottom			

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: NX wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS: Rock change @ ~14' - phyllite to quartz schist (?) - or is this a precipitate? Sands may likely have mixed w/ mud prior to metamorphosis.

Tetra Tech NUS, Inc.

BORING NO.: MW02B

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K. Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW02B
START DATE: 8-26-03
COMPLETION: DATE: 8-26-03
MON. WELL NO.: MW02B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
16		CORE 3	No samples for lab analysis		Weathered to broken	Dark Gray	SLATE/PHYLLITE - similar to Core 1 + part of Core 2 run		CORE 3: PEN = 5' REC = 5'	
17			16-17' = 1min 27sec				• Shiny surface/sheen to rock surface		RQD = 0% 0in/60in	
18			17-18' = 3min 10sec				• Graphitic sheen? Fresh surface is v. dark gray		X100 = 0% No pieces >4in length	
19		5'/5'	18-19' = 2min 8sec				• Few pieces show iron stains btwn chips or frags • Fissile - chips ~1/4-1/2in thick		Driller reports loss of ~10gals 16-21'	
20			19-20' = 3min 10sec				• Horizontal to low angle fractures - along bedding • No granular texture noted as observed in Core Run 2.			
21			20-21' = 2min 39sec							
22		CORE 4	21-22' = 2min 40sec				SLATE/PHYLLITE - similar to above • Iron stains noted 21-22' btwn rock chips		CORE 4: PEN = 5' REC = 5' RQD = 0% 0in/60in	NO FID OR PID readings >0ppm over interval
23		5'/5'	22-23' = 2min 57 sec				• Graphitic nature to fresh surface - v. dark gray		X100% = 0% No pieces >4in length	
24			23-24' = 3min 5 sec				• Seeing more oxidized surfaces @ ~2-2.5' • Fissile - breaks readily along bedding planes		Driller reports loss of 15 gals 21-26'	

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: NX Wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.: MW02B

Tetra Tech NUS, Inc.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW02B
START DATE: 8-26-03
COMPLETION: DATE: 8-26-03
MON. WELL NO.: MW02B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
24		CORE 4 (cont.)	24-25' = 2min 20 sec		Weathered to broken	Dark Gray	- No oxidized surfaces evident from 24-26 ft.			
25							- Horizontal to low angle fractures			
			25-26' = 2min 15sec							
26										
		CORE 5	26-27' = 1min 49sec			Light - DK Gray	SLATE/PHYLLITE		CORES: PEN=5' REC=4'7"	NO FID/PID readings >0ppm over rock
27					Weathered + Broken still but better/more competent than last run. seemingly		• Dark color noted on v. fresh surface		RQD=0% 0in/60in	
			27-28' = 2min 16 sec				- graphitic sheen/shine		X100% = 0% No pieces >4in length	
28							• Though no pieces >4in length - rock seems more competent than prev. runs		High angle fractures	
		4.7'/5'	28-29' = 2min 20 sec				• Some crenulations noted		@ 1-1.5' and @ 2.5' (45-60°)	
29							- Significantly degraded rock @ ~29-30'		Driller reports loss of ~10 gals along interval	
			29-30' = 2min 40 sec				Slightly oxidized surfaces (iron stains)			
30							- Rocks chip severely broken - all fragments about 1" long			
			30-31' = 2min 19 sec							
31										
		CORE 6	31-32' = 1min 47 sec		More competent than above	Light/DK Gray	SLATE/PHYLLITE		CORE 6 PEN=5' REC=5'	NO FID/PID readings >0ppm over interval
32							• DK color noted on fresh surfaces			

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: NX Wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.: MW02B

Tetra Tech NUS, Inc.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW02B
START DATE: 8-26-03
COMPLETION: DATE: 8-26-03
MON. WELL NO.: MW02B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
32		CORE 6 CONT.	32-33' = 1 min 40 sec		More compet. than above	Light Gray to DK Gray	SLATE / PHYLLITE CONT.		CORE 6 RQD = 17.5 in/60 in x 100% = ~29%	
33							- Graphitic sheen to rock surface			
		5'/5'	33-34' = 1 min 58 sec				- No crenulations observed. No significant iron stains		(4 pieces > 4 in length)	
34					Softer		- More weathered rock @ ~33-34'. Iron stains evident for this interval		Broken/soft rock @ ~33-34'	
			34-35' = 1 min 45 sec		More competent		- Fissile - horiz. fracs. along bedding		Driller reports overall loss of 10 gals in Core Run 6	
35							- Trace evidence of iron stains @ ~35'			
			35-36' = 1 min 50 sec							
36										
		CORE 7	36-37' = 2 min 34 sec		(Completely increasing w/ depth) as expected	Lighter Gray	SLATE / PHYLLITE		CORE 7 PEN = 5' REC = 5'	FID/PID = 0 ppm over rock core
37							- Several broken pieces - gravel size at top of run		RQD = 19 in/60 in x 100% = ~32%	
		5'/5'	37-38' = 1 min 28 sec				- Less crumbly w/ depth. No obvious sheen or presence of crenulations		(3 pieces > 4 in length)	
38							- Frac @ ~38-39' higher angle (~45°) - rest are nearly horiz.		Driller reports overall loss of 10 gals in Core Run 7	
			38-39' = 1 min 30 sec			Darker Gray	- Darker coloration - both outside/inside surfaces			
39										
			39-40' = 1 min 23 sec							
40										

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: NX Wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

Tetra Tech NUS, Inc.

BORING NO.: MW02B

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW02B
START DATE: 8-26-03
COMPLETION: DATE: 8-26-03
MON. WELL NO.: MW02B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
40		CORE 7 CONT	40-41' = 1 min 36 sec			Dark Gray	SLATE/PHYLLITE CONT.			
41							- some iron stains evident at end of run			
		CORE 8	41-42' = 1 min 30 sec		Most competent of all prev. runs		SLATE/PHYLLITE		CORE 8: PEN=5' REC=5'	
42							- slightly granular texture at top of run		RQD= 24in/60in x 100% = ~40% (5 pieces > 4in length)	
			42'-43' = 50 sec							
43		5'/5'				Dark Gray	- Fissile in parts - horiz. breaks at times			FID/PID=
			43'-44' = 1 min				- Dark coloration - inside/outside surfaces			0 ppm over rock
44							- Graphitic sheen/shine present			
			44-45' = 1 min 26 sec							
45										
			45-46' = 1 min 53 sec				- Higher angle fracs at bottom of run (~25°)		Checked actual TD - measures 44.8' bgs - coring off a little.	
46										
							EOB @ 44.8' (actual)			
47							Install well - see well log			
48										

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: NX Wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

Tetra Tech NUS, Inc.

BORING NO.: MW02B

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW03B
START DATE: 8-27-03
COMPLETION: DATE: 8-27-03
MON. WELL NO.: MW03B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0							Ground surface			
			-			Brown			Drill area @ TP11 Approx. 6' north of soil gas hit	
1						Gray				
							- Advance 3" casing			
2							- Silts, Sands in cuttings			
3										
4										
						Gray	Bedrock @ ~4' - color change		Encountered weathered rock @ ~4' in TP11 Cleaned out tub prior to seating casing	Open w/ FID/PID - water in tub + BZ
5										
6							- Rock very soft, weathered			
							- Seated 3" casing 4' into rock (4'-8')			
7										
8										

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: Rollerbit used after attempts failed @ coring w/ NX wireline
GROUNDWATER LEVELS: ~18' per driller
OTHER OBSERVATIONS: Location about 15-20' above pond

BORING NO.: MW03B

Tetra Tech NUS, Inc.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW03B
START DATE: 8-27-03
COMPLETION: DATE: 8-27-03
MON. WELL NO.: MW03B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
8										
		0'/1'	8-9' = 2min 49 sec w/multiple try's				- lost 50 gal water @ 8-9'		Problems w/ drilling - problems w/ hose	
9							- Multiple starts/stops			
							- lost 200 additional gals water 9-10' as soon as drilling started - no water recirculating		No recovered core 8-10' - Potential fracture zone @ 9'	
10										
						Gray to Gray-Brown	Rollerbit through rock (weathered)		Switch to rollerbit @ 10' and advance rollerbit thru weathered rock	
11										
12							- easy to advance thru w/ rollerbit		No retrievable core 10-24'	
13										
							- Shale-like cuttings			
14							V. soft weathered rock			
15										
16										

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: Rollerbit after attempts failed @ coring w/ NX wireline
GROUNDWATER LEVELS: ~18' per driller
OTHER OBSERVATIONS: Location about 15-20' above pond

BORING NO.: MW03B

Tetra Tech NUS, Inc.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW03B
START DATE: 8-27-03
COMPLETION: DATE: 8-27-03
MON. WELL NO.: MW03B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
16		N/A	N/A -			Gray to Gray-Brown			No retrievable core - Used rollerbit to advance thru weathered rock for purposes of creating a corehole for subsequent installation of a well.	
17										
18							- Shale-like cuttings - degraded			
19							- possible water table per driller			
20										
21										
22							- Shale-like cuttings - degraded			
23										
24							EOB @ ~24'. Install well -		see well log	

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA to initiate pilot hole; drive & wash to advance boring
METHOD OF SOIL SAMPLING: None
METHOD OF ROCK CORING: Rollerbit after attempts failed @ coring w/ NX wireline
GROUNDWATER LEVELS: ~18' per driller
OTHER OBSERVATIONS: Location about 15-20' above pond

BORING NO.: MW03B

Tetra Tech NUS, Inc.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/Geosearch/D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW04B
START DATE: 8-27-03
COMPLETION: DATE: 8-29-03
MON. WELL NO.: MW04B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
0							Ground surface			
			No samples for lab from 0-8'						Advance to 8' via 4¼"x 8in OD HSA	
1							Refer to test pit log TP01 for soil descriptions from 0-8'			
2										
3										
4										
5										
6										
7										
END 8-27-03 8										

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA 0-16' (4¼"x 8" OD HSA); 3 inch casing from 16'-18'; coreberred 18'-45'
METHOD OF SOIL SAMPLING: Continuous split-barrel in 2' intervals from 8'-16' only. No samples 0-8'
METHOD OF ROCK CORING: NX wireline
GROUNDWATER LEVELS: At top of rock or just below. No gw in OB materials noted
OTHER OBSERVATIONS:

BORING NO.: MW04B

Tetra Tech NUS, Inc.

Tnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): EDI/Geosearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW04B
START DATE: 8-27-03
COMPLETION: DATE: 8-29-03
MON. WELL NO.: MW04B
CHECKED BY:

	DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
8-28-03	8										
		4 4		DA-S-MW04B-0810-01 8-28-03@ 0740 hrs (8-10')	Silty Sand Gravel + Fill debris	SOFT/LOOSE	BROWN	SILTY SAND - SOME GRAVEL (f. sand, poorly graded, f+c subangular and	SM/	Fines appear to hold water (wet)	FID Scan: 1.4 PID Scan: 0.6
	9	7 9	0.6'/2'					subrounded gravel 1/2-1.25in diam.,	FILL		
								concrete)			FID HS = 2.8 PID HS = 0.9
	10										
START 8-29-03		2		No samples for lab		Loose		- Similar to above w/ fine+med sand, more concrete			FID Scan = 0.0 PID Scan = 0.0
	11	4	0.7'/2'								
		20									FID HS = 0.0 PID HS = 0.0
	12	24									
		8	0.6'/2'			Loose		- Similar to above		Poor recovery - fines are wet but sands are dry	FID Scan = 0.0 PID Scan = 0.0
	13	6									
		14									FID HS = 0.0 PID HS = 0.8
	14	16									
		7	1.5'/2'	DA-S-MW04B-~~0810~~-1416-01 8-29-03 @ 0800 hr (14-16')	Rock	Loose		- Similar to above w/ visible concrete (14-15')			FID Scan = 0.0 PID Scan = 0.2
	15	11									
		16				Broken rock	Gray	WEATHERED BEDROCK - SHALE/SLATE	ROCK	Bedrock @ 15' Clean area + install 3" casing	FID HS = 0.0 PID HS = 1.0
	16	42						- Degraded; crumbles easily w/ finger pressure; iron stains brown pieces		wet (?)	

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA 0-16' (4 1/4" x 8" OD HSA); 3 inch casing from 16'-18'; coreberrel 18'-45'
METHOD OF SOIL SAMPLING: Continuous split-barrel in 2' intervals from 8-16' only. No samples 0-8'
METHOD OF ROCK CORING: NX wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS: Rig problems on 8/28/03. Broke CATHEAD. Left site after 1 sample collected to repair rig. Returned 8/29/03 w/ repaired rig + resumed work

Tetra Tech NUS, Inc.

BORING NO.: MW04B

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jaikut
DRILLED BY (Company/Driller): EDI/Geosearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW04B
START DATE: 8-27-03
COMPLETION: DATE: 8-29-03
MON. WELL NO.: MW04B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
16					Chips	Gray	- Degraded rock cuttings in washwater - shale-like to slate-like		Install 3" casing 0-16'. Advance 3" casing to 18' to seat it in rock	
17										
18				slate/ phyllite	Broken	Gray to Gray Brown				
19		CORE 1 1.4'/2'	18-19' = 2 min				SLATE / PHYLLITE • Shiny surface to broken pieces • Iron stains visible btwn pieces (oxidized) • Nearly all horizontal breaks to low angle fractures • Bottom portion more degraded than top		Initiate CORE 1 @ 18' PEN = 2' REC = 1.4' RQD = 0% 0 in/24 in x100% = 0% No pieces > 4 in length (18-20')	FID/PID scan = 0.0/0.0
20			19-20' = 2 min 32 sec							
21		CORE 2 4.8'/5'	20-21' = 1 min 50 sec				SLATE / PHYLLITE - similar to core • Near vertical fracture ~20.75'-21'		CORE 2 Pen = 5' Rec = 4.8' RQD = 0% - similar to above. No pieces > 4 in length	
22			21-22' = 2 min 17 sec	pits			• All surfaces w/ iron stains - oxidized btwn breaks too - dk red-brown • Small pits observed - vesicular-like		Lost 30 gal H_2O from 20-25'	
23			22-23' = 2 min 1 sec				• Fissile • Small vertical frac 22.5'-23' • Strongly pitted - small circular to irregular shaped pits up to 1/2 in diam		Pits do not react w/ acid - weathered out, non-calcareous mineral ?	FID/PID scan = 0.0/0.0
24			23-24' = 2 min 18 sec				• Near vertical fracture @ 23.5 - 24.5'			

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA 0-16' (4 1/4" x 8" OD HSA); 3 inch casing from 16'-18'; coreborred 18'-45'
METHOD OF SOIL SAMPLING: Continuous split-barrel in 2' intervals from 8'-16' only. No samples 0-8'
METHOD OF ROCK CORING: NX wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS: Pitted texture starting @ ~22-23' - weathered out mineral (?)

BORING NO.: MW04B

Tetra Tech NUS, Inc.

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI / Geosearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW04B
START DATE: 8-27-03
COMPLETION: DATE: 8-29-03
MON. WELL NO.: MW04B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
24		END CORE 2	24-25' = 2min 34 sec		Broken	Gray Brown	SLATE/PHYLLITE - Similar to Core 1 - soft, degraded rock, oxidized, crumbles w/ finger pressure		- Unidentified brown stain or coloration (old oxidized surface (?))	
25										
26		CORE 3	25-26' = 1min 24 sec	mostly slate/phyllite		Light Gray	SLATE PHYLLITE - similar to core runs 1+2 • weathered, degraded		CORE 3 PEN=5' REC=5' RQD - 0% similar to runs 1+2. No pieces >4in length	FID/PID scan = 0.0/0.0
27		5'/5'	26-27' = 2min 7 sec				• oxidized surfaces brown (core breaks dk orange brown coloration) • pieces < 1in thick to 2in thick			
28			27-28' = 2min 16 sec	slate/phyllite quartz schist	Pitted texture	Tan + Gray	• At 27' - sm. vertical break, pitted, granular texture, cemented sands • Additional pitted texture, weathered, pits w/ oxidized coloration in them		Interval w/ Quartz schist? Foliated (?) Lens (?)	
29			28-29' = 2min 41 sec				• Sm. vertical break along oxidized seam • Additional breaks in coarser grain material - quartz schist (?)		No water loss during Core 3 run	
30			29-30' = 3min 4 sec	phyllite + quartz schist			• Most frac. along bedding - horiz. • Additional pitted texture - weathered out mineral (?) - brown coloration brown breaks			
31		CORE 4 5'/5'	30-31' = 1Min 40 sec	QUARTZ SCHIST		Light Gray Tan-Brown	SLATE/PHYLLITE to ~30.5' QUARTZ SCHIST • Foliated, granular texture • Red-brown coloration on grains - oxidized (?)		CORE 4: PEN=5' REC=5' RQD = ~38% 23in/60in x 100% = ~38%	FID/PID scan = 0.0/0.0
32			31-32' = 2min 6 sec				• Vertical break in sands @ ~31'; sl. pitted • Dk brown coloration to vert. break		1 piece approx. 4.5" in length; other total 23in for pieces >4in length	

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA 0-16' (4 1/4" x 8" OD HSA); ~3 inch casing from 16'-18'; corebarred 18'-~45'
METHOD OF SOIL SAMPLING: Continuous split-barrel in 2' intervals from 8-16' only. No samples 0-8'
METHOD OF ROCK CORING: NX wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS: At ~27' - possible interval of quartz schist in the phyllite to ~29' can still make out ~~remn~~ remnants of phyllite too

Tetra Tech NUS, Inc.

BORING NO.: MW04B

Tnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/Geosearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW04B
START DATE: 8-27-03
COMPLETION: DATE: 8-29-03
MON. WELL NO.: MW04B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
32		CORE 4 CONT.	32-33': 2min 20 sec	Quartz Schist		Gray brown to Brown	QUARTZ SCHIST - Foliated (?) • No fissility visible • Vertical break ~33-33.5'		CORE 4 CONT. Lost ~10 gals overall in Core 4 run	~~FID~~/PID Scan = 0.0/0.0
33			33-34': 1min 44 sec			Red-brown to Brown	• Oxidized, vertical seams approx. 3" long - not connected to one another - weathered		Circular, swirly texture too	
34			34'-35': 2min 40 sec				• Additional pitted texture - more elongated, weathered, not filled, red-brown • Low angle breaks @ bottom of run			
35		CORE 5	35-36': 1min 7 sec				QUARTZ SCHIST CONT. - similar to above - - dk black coloration on some of the granular pieces - weathered; iron stains on weathered pieces - Additional pits observed		CORE 5 PEN=5' REC=5' RQD= 10in/60in x100 = 16-17%	NO FID/PID Readings > 0.0/0.0 on rock
36			36'-37': 2min 38 sec							
37		5'/5'	37'-38': 2min	Slate/phyllite	V. SOFT	Light Gray	SLATE / PHYLLITE @ ~37' - Fissile nature returns - Shiny surface visible - Some crenulations visible - Nearly horizontal breaks - along bedding - Fewer iron stains btwn breaks (rare) - Breaks occur w/ slight finger pressure		Very degraded @ ~38' - Mush-like - very soft rock.	
38			38'-39': 2min 10sec							
39			39'-40': 2min							
40										

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA 0-16' (4¼" x 8" OD HSA); ~3 inch casing from 16'-18'; corebarrel 18'-~45'
METHOD OF SOIL SAMPLING: Continuous split-barrel in 2' intervals from 8'-16' only. No samples 0-8'
METHOD OF ROCK CORING: NX wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS: Quartz Schist (?) extends from ~27' at start to about 37' * (MIX)

Tetra Tech NUS, Inc.

BORING NO.: MW04B

Ttnus Form 0018

BORING LOG FOR: NUSC Disposal Area
PROJECT NO.: 8856
LOGGED BY: K Jalkut
DRILLED BY (Company/Driller): EDI/GeoSearch / D. Crawford
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: MW04B
START DATE: 8-27-03
COMPLETION: DATE: 8-29-03
MON. WELL NO.: MW04B
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING: TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
40		CORE 6			Broken	Light Gray	SLATE/PHYLLITE		CORE 6 PEN=5'	NO FID/PID
			40-41': 1min 37 sec				- similar to rock @ ~37'		REC = 3.3'	reading >0.0/0.0
41							- minimal evidence of oxidation btwn core breaks		RQD = 0% (no pieces > 4in length)	over rock
			41-42': 3min 51sec	slate/ phyllite						
42		3.3'/5'					- Fissile; nearly horiz. breaks			
			42-43': 3min 37 sec				- Degraded rock			
43							- shiny surface			
			43-44': 2min 7sec							
44										
			44-45': 3min 16 sec							
45							EOB @ 45'. Install well. See well log for details			
46										
47										
48										

TYPE OF DRILLING RIG: Mobile B-59
METHOD OF ADVANCING BORING: HSA 0-16' (4¼" x 8" OD HSA); 3 inch casing from 16'-18'; corebarrel 18'-45'
METHOD OF SOIL SAMPLING: Continuous split barrel in 2' intervals from 8'-16' only. No samples 0-8'
METHOD OF ROCK CORING: NX wireline
GROUNDWATER LEVELS:
OTHER OBSERVATIONS: See previous page

BORING NO.: MW04B

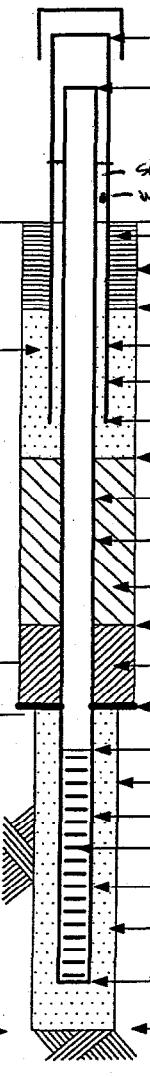
Tetra Tech NUS, Inc.

Ttnus Form 0018

B3 – WELL CONSTRUCTION LOGS

BEDROCK MONITORING WELL CONSTRUCTION LOG — TETRA TECH NUS, INC.

PROJECT NAME: NUSC Disposal Area
PROJECT NO: 8856
PROJECT LOCATION: Newport, RI
WELL NO: MW01B
CLIENT: Navy
BORING NO: MW01B
CONTRACTOR: EDI/GeoSearch
DRILLER: D. Crawford
BORING LOCATION: ~5ft NW side of TP02 (test pit w/ tar filled drums)
LOGGED BY: K Jaikut
DATE: 8-22-03
CHECKED BY:
DATE:
PAGE: 1 OF 1



ELEVATION TOP OF PROTECTIVE CASING	
ELEVATION TOP OF RISER PIPE	
GROUND ELEVATION	
LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE (Ft.)	2.98 } Field meas.
LENGTH OF RISER PIPE ABOVE GROUND SURFACE (Ft.)	2.80 by 8-22-03
TYPE OF SURFACE SEAL	Cement
DIA. SURFACE SEAL BGS (In.)	<1' (not a pad)
DEPTH TO BOTTOM OF SURFACE SEAL (Ft.)	~1
I.D. OF PROTECTIVE CASING (In.)	~4
TYPE OF PROTECTIVE CASING	Steel s/u guard pipe
DEPTH BOTTOM OF PROTECTIVE CASING (Ft.)	~2
DEPTH BOTTOM OF DRAIN LAYER (Ft.)	~3.5
RISER PIPE (In.) I.D.: 1	O.D.: 1.3
TYPE OF RISER PIPE	Sched. 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Bentonite chips
DEPTH TOP OF SEAL (Ft.)	~8
TYPE OF SEAL	Bentonite chips
DEPTH BOTTOM OF SEAL (Ft.)	~9.3
DEPTH TO BEDROCK (Ft.)	~10
DEPTH TO RING (Ft.)	N/A
DEPTH TOP OF PERVIOUS SECTION (Ft.)	~10 (*)
DIAMETER OF BOREHOLE (In.)	~ 3in (2.9)
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
TYPE OF OPENINGS	0.010 slots
PERVIOUS SECTION (In.) I.D.: 1	O.D.: 1.3
TYPE OF FILTER PACK AROUND PERVIOUS SECTION	~20 U.S Sieve size (No 2)
DEPTH BOTTOM OF PERVIOUS SECTION (Ft.)	38.9 (~39')
DEPTH BOTTOM OF FILTER PACK (Ft.)	39.9 (~40')

Notes: - Installed a 1' long sump below the pervious section
(*) - Brought sand filter pack up above OB/rock interface - it may settle to top of rock over time

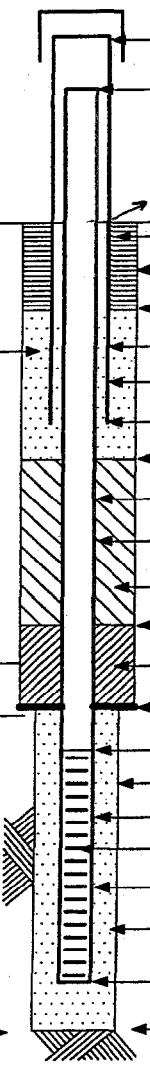
GENERAL NOTE:

1. Entry of 0.00 for Ground Elevation, Elev. Top of Riser Pipe & Elev. Top of Protective Casing Indicates that Surveyed Ground Elevation Not Available.

BEDROCK MONITORING WELL CONSTRUCTION LOG — TETRA TECH NUS, INC.

PROJECT NAME: NUSC Disposal Area
PROJECT NO: 8856
PROJECT LOCATION: Newport, RI
WELL NO: MW02B
CLIENT: Navy
BORING NO: MW02B
CONTRACTOR: EDI/GeoSearch
DRILLER: D. Crawford
BORING LOCATION:
LOGGED BY: K Jalkut
DATE: 8-26-03
CHECKED BY:
DATE:
PAGE: 1 OF 1

ELEVATION TOP OF PROTECTIVE CASING
ELEVATION TOP OF RISER PIPE
GROUND ELEVATION



LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE (Ft.): N/A (Flush-mount)
LENGTH OF RISER PIPE ABOVE GROUND SURFACE (Ft.): N/A (Flush-mount)
TYPE OF SURFACE SEAL: cement
DIA. SURFACE SEAL BGS (In.): 1'x1' pad
DEPTH TO BOTTOM OF SURFACE SEAL (Ft.): ~8.5in (0.7')
I.D. OF PROTECTIVE CASING (In.): 5 11/16
TYPE OF PROTECTIVE CASING: Flushmount - steel top w/PVC collar
DEPTH BOTTOM OF PROTECTIVE CASING (Ft.): ~10in (~.83')
DEPTH BOTTOM OF DRAIN LAYER (Ft.): ~2
RISER PIPE (In.) I.D.: 1" O.D.: 1.3'
TYPE OF RISER PIPE: Schedule 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE: Bentonite Chips
DEPTH TOP OF SEAL (Ft.): ~3.5
TYPE OF SEAL: Bentonite Chips
DEPTH BOTTOM OF SEAL (Ft.): ~5.5
DEPTH TOP OF PERVIOUS SECTION (Ft.): 6.8
DIAMETER OF BOREHOLE (In.): ~[illegible]-3in (2.9in)
TYPE OF PERVIOUS SECTION: Schd. 40 PVC
TYPE OF OPENINGS: 0.010 slots
PERVIOUS SECTION (In.) I.D.: 1 O.D.: 1.3
TYPE OF FILTER PACK AROUND PERVIOUS SECTION: No. 2 sand (20 US Sieve)
DEPTH BOTTOM OF PERVIOUS SECTION (Ft.) + sump: 44.8 (~45')
DEPTH BOTTOM OF FILTER PACK (Ft.): 44.8 (~45')

Note - Top of rock @ ~6' bgs. Screen length approx. 38'. Small portion of area near interface is not screened - riser only.
- Requested filter pack be installed approx. 0.5 ft above interface - may settle over time.

GENERAL NOTE:

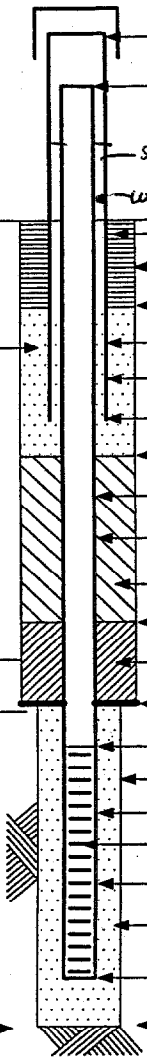
1. Entry of 0.00 for Ground Elevation, Elev. Top of Riser Pipe & Elev. Top of Protective Casing Indicates that Surveyed Ground Elevation Not Available.

BEDROCK MONITORING WELL CONSTRUCTION LOG — TETRA TECH NUS, INC.

PROJECT NAME: NUSC Disposal Area
PROJECT LOCATION: Newport, RI
CLIENT: Navy
CONTRACTOR: EDI/GeoSearch
DRILLER: D. Crawford
LOGGED BY: K Jalkut
DATE: 8-27-03
CHECKED BY:
DATE:

PROJECT NO: 8856
WELL NO: MW03B
BORING NO: MW03B
BORING LOCATION: At testpit 11

PAGE: 1 OF 1



ELEVATION TOP OF PROTECTIVE CASING
ELEVATION TOP OF RISER PIPE
GROUND ELEVATION
DEPTH TO BEDROCK (Ft.) ~4
DEPTH TO RING (Ft.) N/A
END OF BORING @ ~24 Ft.

LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE (Ft.)	~3.5
LENGTH OF RISER PIPE ABOVE GROUND SURFACE (Ft.)	~3.3
TYPE OF SURFACE SEAL	Cement
DIA. SURFACE SEAL BGS (In.)	~10 (not a pad)
DEPTH TO BOTTOM OF SURFACE SEAL (Ft.)	~1
I.D. OF PROTECTIVE CASING (In.)	4
TYPE OF PROTECTIVE CASING	Steel Guard Pipe
DEPTH BOTTOM OF PROTECTIVE CASING (Ft.)	~1.5
DEPTH BOTTOM OF DRAIN LAYER (Ft.)	2
RISER PIPE (In.) I.D.: 1 O.D.:	1.3
TYPE OF RISER PIPE	Sched. 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Bent. chips
DEPTH TOP OF SEAL (Ft.)	2
TYPE OF SEAL	Bent. chips
DEPTH BOTTOM OF SEAL (Ft.)	~3.5
DEPTH TOP OF PERVIOUS SECTION (Ft.)	~4
DIAMETER OF BOREHOLE (In.)	~3
TYPE OF PERVIOUS SECTION	Schedule 40 PVC
TYPE OF OPENINGS	0.010 slots
PERVIOUS SECTION (In.) I.D.: 1 O.D.:	1.3
TYPE OF FILTER PACK AROUND PERVIOUS SECTION	No. 2 sand (US Sieve Size 20)
DEPTH BOTTOM OF PERVIOUS SECTION (Ft.)	~24
DEPTH BOTTOM OF FILTER PACK (Ft.)	~24

GENERAL NOTE:

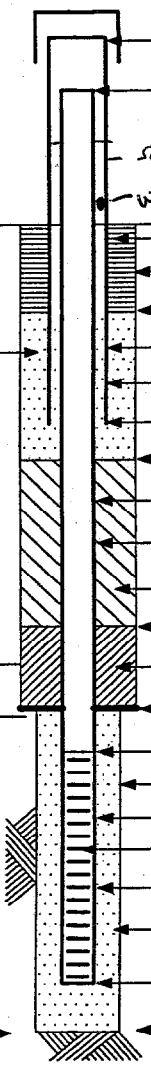
1. Entry of 0.00 for Ground Elevation, Elev. Top of Riser Pipe & Elev. Top of Protective Casing Indicates that Surveyed Ground Elevation Not Available.

BEDROCK MONITORING WELL CONSTRUCTION LOG — TETRA TECH NUS, INC.

PROJECT NAME: NUSC Disposal Area
PROJECT LOCATION: Newport RI
CLIENT: Navy
CONTRACTOR: EDI/Geosearch
DRILLER: D. Crawford
LOGGED BY: K Jalkut
DATE: 8-29-03
CHECKED BY:
DATE:

PROJECT NO: 8856
WELL NO: MW04B
BORING NO: MW04B
BORING LOCATION: At test pit TP01 location

PAGE: 1 OF 1



ELEVATION TOP OF PROTECTIVE CASING:
ELEVATION TOP OF RISER PIPE:
GROUND ELEVATION:
DEPTH TO BEDROCK (Ft.): ~15
DEPTH TO RING (Ft.): N/A

LENGTH OF PROTECTIVE CASING ABOVE GROUND SURFACE (Ft.)	~2'
LENGTH OF RISER PIPE ABOVE GROUND SURFACE (Ft.)	~1.9
TYPE OF SURFACE SEAL	Cement
DIA. SURFACE SEAL BGS (In.)	~10 (not a pad)
DEPTH TO BOTTOM OF SURFACE SEAL (Ft.)	~1
I.D. OF PROTECTIVE CASING (In.)	4
TYPE OF PROTECTIVE CASING	Steel Guard Pipe
DEPTH BOTTOM OF PROTECTIVE CASING (Ft.)	~3
DEPTH BOTTOM OF DRAIN LAYER (Ft.)	4.3
RISER PIPE (In.) I.D.: 1 O.D.: 1.3	
TYPE OF RISER PIPE	Sched. 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	Bent. chips
DEPTH TOP OF SEAL (Ft.)	~12.5
TYPE OF SEAL	Bentonite chips
DEPTH BOTTOM OF SEAL (Ft.)	~14.5
DEPTH TOP OF PERVIOUS SECTION (Ft.)	~15
DIAMETER OF BOREHOLE (In.)	~3
TYPE OF PERVIOUS SECTION	Sched. 40 PVC
TYPE OF OPENINGS	0.010 slots
PERVIOUS SECTION (In.) I.D.: 1 O.D.: 1.3	
TYPE OF FILTER PACK AROUND PERVIOUS SECTION	No. 2 sand (U.S Sieve size 20)
DEPTH BOTTOM OF PERVIOUS SECTION (Ft.)	~45'
DEPTH BOTTOM OF FILTER PACK (Ft.)	~45'

- Using bottom 3" of (non-slotted area) screen to serve as sump
- Brought filter pack up above interface

GENERAL NOTE:

1. Entry of 0.00 for Ground Elevation, Elev. Top of Riser Pipe & Elev. Top of Protective Casing Indicates that Surveyed Ground Elevation Not Available.

APPENDIX C

SAMPLE COLLECTION LOGS

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: NUSC Disposal Area
Sample ID: DA-A-MW01B-01

Tetra Tech NUS Job No./PMS 8856
QC: DA-A-MWDUP08-01 (If applicable)

Sample Method: 1" Portable bladder Pump
Depth Sampled: 27 Feet Screened Interval Depth 15-45 feet
Sample Date & Time: 09/04/03 1445 hours DUP08/Dup@1500
Sampler(s): Daniel Hartigan
Data Recorded By: Daniel Hartigan Signature: D Hartigan
Notes:
Well located immediatly downgradient of testpit-02, drums.

H&S Survey Meter PID 0.0/FID 0.0 PPM
Pre-pump insertion WL 11.64 ft
Field Instrument Group A/B/C/D
Post - pump insertion WL 11.69 ft

Analysis	Bottle Lot#	Analysis	Bottle Lot #	Analysis	Bottle Lot #
VOCs		TAL Metal			
SVOCs		Diss. Metal			
Pest/PCBs					

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cum. Volume Purged liters	Temp °C	Spec. Cond. 2 uS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
11:40	11.64	CPM 6	60	0	19.58	0.497	6.03	366	2.25	31.0	BEGIN PURGE
1150		"	60		19.40	0.500	5.97	367.6	1.94	24.5	
1200	11.68	↑ "	85		17.55	0.294	5.89	372.8	1.00	31.1	
1210	11.67	↑ "	90		17.22	0.272	5.89	381.5	0.88	16.8	
1220	11.68	"	90		17.23	0.259	5.88	389.6	0.84	11.8	
1230	11.68	"	90		17.25	0.260	5.90	395.1	0.82	12.2	
1240	11.68	"	90		17.18	0.255	5.87	400	0.78	6.72	
1250	11.68	"	90		17.15	0.255	5.88	405.4	0.75	5.99	
1300	11.69	"	90		17.14	0.259	5.91	407.5	0.75	7.82	
1310	11.69	"	90		17.03	0.260	5.91	408.9	0.75	3.51	
1320	11.68	"	90		17.67	0.262	5.92	408.0	0.77	3.03	
1330	11.68	"	90		18.54	0.262	5.93	407.2	0.85	1.51	
1340	11.68	"	90		17.10	0.257	5.90	411.3	0.75	4.68	
1350	11.68	"	90		17.06	0.258	5.91	413.4	0.79	3.95	
→ log sheet was wet at bottom, see other page.											Page 2 →

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

Tt NUS Form 0009

Sample lables marked 4/9/03 dd/mm/yy instead of 09/04/03 (mm/dd/yy)

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: NUSC Disposal Area
Sample ID: DA-A-MW01B-01

Tetra Tech NUS Job No./PMS 8856
QC: DA-A-MWDUP08-01 (If applicable)

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cum. Volume Purged liters	Temp °C	Spec. Cond. 2 uS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
1400	11.68	CPM 6	90	~3.5	16.81	0.258	5.90	414.5	0.72	2.73	
1410	11.68	CPM 6	90		17.05	0.257	5.90	415.1	0.74	1.96	
1420	11.68	"	90		17.24	0.255	5.91	418	0.72	2.15	
1430	11.68	"	90		17.26	0.256	5.91	418.5	0.71	2.12	
1440	11.68	"	90		17.29	0.257	5.92	419.1	0.72	1.98	
1445											COLLECT SAMPLE

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

Tt NUS Form 0009

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: NUSC Disposal Area
Sample ID: DA-A-MW02B-01

Tetra Tech NUS Job No./PMS 8856-
QC: MS/MSD (If applicable)

Sample Method: Low stress w/mini bladder pump for 1" well
Depth Sampled: ~28 Feet bgs Screened Interval Depth 6.4-44.4 feet bgs
Sample Date & Time: 9/3/03 1450 hours N/A /Dup
Sampler(s): K Jaikut
Data Recorded By: K Jaikut Signature: K Jaikut
Notes:
MP = Top of PVC (stickup = ~0.24') from
TD = 43.82 - top of PVC
1" PVC well
1 well vol = ~1.6 gal using V = .163 r²h where r = .5, h = ~39'
Intake depth based on FID/PID HS readings on GW during well development

H&S Survey Meter 0 PPM Field Instrument Group A/B/C/D
Pre-pump insertion WL 4.82 ft Post - pump insertion WL 4.82 ft
Notes: No effervescence; pH @ 1.5 in 40ml vial; slight petroleum-like sheen on purge water + sample; visible in a bailer check. No LNAPL/DNAPL signal w/ interface probe. No NAPL

Analysis	Bottle Lot#	Analysis	Bottle Lot #	Analysis	Bottle Lot #
VOCs		TAL Metals			
SVOCs		Diss. Metals			
Pest/PCBs					

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cum. Volume Purged ~~liters~~ gals.	Temp °C	Spec. Cond. 2 µS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
1130	4.82	CPM 6 5/5	40	Filling tubing	and flow cell						
1155	4.82	CPM 4 10/5	60		22.67	0.301	6.37	-51.3	1.40	22.8	~25psi
1205 *	4.82	CPM 4 10/5	60		22.49	0.293	6.36	-55.5	0.68	8.48	Bright sun -
1215	4.82	CPM 4 10/5	60		22.57	0.292	6.37	-56.7	0.55	6.92	trying to keep cell
1225	4.82	CPM 4 10/5	60		22.55	0.290	6.34	-57.5	0.46	3.52	and tubing from
1235	4.82	CPM 4 10/5	60		22.87	0.291	6.32	-56.2	0.46	2.89	direct exposure
1245	4.82	CPM 4 10/5	60		22.53	0.289	6.33	-55.6	0.38	15.6	} disturbed
1255	4.87	CPM 4 10/5	60		22.71	0.289	6.36	-58.2	0.36	22.6	} tubing
1305	4.87	CPM 4 10/5	60		22.71	0.289	6.36	-58.2	0.36	104.3	} accidentally
1315	4.87	CPM 4 10/5	60		22.71	0.289	6.36	-58.2	0.36	13.6	
1325	4.87	CPM 4 10/5	60		22.71	0.289	6.36	-57.5	0.36	7.58	Low flow valve
1335	4.87	CPM 4 10/5	60		22.71	0.289	6.36	-58.2	0.36	4.53	associated w/ increase
1345	4.87	CPM 4 10/5	60		22.71	0.289	6.36	-58.2	0.36	3.65	gw temp. —
1355	4.87	CPM 4 10/5	60		22.71	0.289	6.36	-58.2	0.36	2.35	water in flow ce
1405	4.87	CPM 4 10/5	60		22.02	0.289	6.40	-60.6	0.28	1.23	exchanges in
1415	4.87	CPM 4 10/5	60	~2.2 gals	21.86	0.290	6.41	-60.3	0.27	1.15	10 minutes!

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

Tt NUS Form 0009

* Increased time btwn readings so that water in the flow cell could exchange fully

Weather (PM) - sunny, low 70s breezy → ~~p. sunny~~ mixed sun w/clouds by 2:30pm
ov. angle @ N12°45' bdrm w/ Dave - offsite 1330

m. 107 2

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: NUSC Disposal Area
Sample ID: DA-A-MW02B-01

Tetra Tech NUS Job No./PMS 8856
QC: _____ (If applicable)

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cum. Volume Purged ~~liters~~ gals.	Temp °C	Spec. Cond. 2 ~~M~~ µS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
1425	4.87	CPM 4 10/5	60		21.99	0.289	6.40	-60.1	0.26	0.92	removed umbella - too breezy
1435	4.87	CPM 4 10/5	60		21.97	0.289	6.40	-59.6	0.26	0.78	cell + meter still
1445	4.87	CPM 4 10/5	60		22.03	0.289	6.40	-59.6	0.26	0.62	covered from direct light

End purge. Parameters - achieved criteria specified in workplan

Start sampling @ 1450hrs.
End sampling @

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

Tt NUS Form 0009

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: NUSC Disposal Area
Sample ID: DA-A-MW03B-01

Tetra Tech NUS Job No./PMS 8856
QC: None (If applicable)

Sample Method: Low stress w/ mini bladder pump in 1" well
Depth Sampled: ~21 Feet bmp Screened Interval Depth ~4-24 feet bmp
Sample Date & Time: 9/5/03 1155 hours N/A /Dup
Sampler(s): K Jalkut
Data Recorded By: K Jalkut Signature: K Jalkut
Notes:
MP = top of PVC
steel s/u = 3.51'
PVC s/u = ~3.38'
- No product signal w/ interface probe (LNAPL or DNAPL) TD = 26.15' below PVC (?)
- No visible sheen on water surface in a bailer
- Pump intake ~2' off bottom due to low water level in well

H&S Survey Meter BZ/PID/well 0 0 0 PPM (PID+FID) Field Instrument Group A/B/C/D
Pre-pump insertion WL 20.94 ft (below top PVC) Post - pump insertion WL 20.95 ft (below top PVC)

Analysis	Bottle Lot#	Analysis	Bottle Lot #	Analysis	Bottle Lot #
VOCs		TAL metals			
SVOCs		DISS. Metals			
Pest/PCBs					

- No effervescence noted
- pH @ 1:5 for check
- No sheen observed on water
- No odors

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cum. Volume Purged liters	Temp °C	Spec. Cond. 2 M µS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
1010	20.95	CPM 4 5/5	50	Filling tubing	& flow	through cell.	Adjusting	flow rates			~25 psi
1030	20.96	CPM 6 5/5	70		17.42	0.327	6.11	348.2	2.56	7.44	~35 psi
1038	20.98	CPM 6 5/5	70		16.70	0.274	6.02	470.3	1.77	5.25	cloudy
1046	20.98	CPM 6 5/5	70		16.75	0.251	6.02	495.5	1.67	3.87	↓
1054	20.98	CPM 6 5/5	70		16.73	0.243	6.01	513.0	1.63	2.13	colorless/clear
1102	20.98	CPM 6 5/5	70		16.68	0.237	5.99	526.6	1.62	2.23	
1110	20.98	CPM 6 5/5	70		16.94	0.237	6.01	534.6	1.58	1.52	
1118	20.98	CPM 6 5/5	70		16.84	0.235	6.00	541.7	1.54	1.97	
1126	20.98	CPM 6 5/5	70		16.84	0.233	6.01	546.0	1.52	0.85	
1134	20.98	CPM 6 5/5	70	↓	16.92	0.231	6.03	548.4	1.53	0.65	
1142	20.98	CPM 6 5/5	70	~1.5 gallons	16.87	0.231	6.04	550.9	1.50	0.71	colorless/clear
1150	End purge + criteria in workplan met										
Sample @ 1155 hrs											
End sampling @											

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

Tt NUS Form 0009

- (AM) Weather - Sunny, less humid, 70s, breezy
- CPM = cycles per minute. Recharge = 5 sec Discharge = 5 sec (5/5)

PK onsite w/ Renee 1200 - 1:10 PM

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: NUSC Disposal Area
Sample ID: DA-A-MW04B-01

Tetra Tech NUS Job No./PMS 8856
QC: None (If applicable)

Sample Method: Low stress w/ mini bladder pump in 1" well
Depth Sampled: ~ 38 Feet bgs Screened Interval Depth 15-45 feet bgs
Sample Date & Time: 9 / 4 / 03 1400 hours N/A /Dup
Sampler(s): K Jalkut
Data Recorded By: K Jalkut Signature: KJalkut

H&S Survey Meter O2 / PW / Well 0 0 0 PPM FID+ PID Field Instrument Group A/B/C/D
Pre-pump insertion WL 16.22 ft (below PVC) Post - pump insertion WL 16.24 ft (below pvc)
No product signal w/ a bailer visible interface probe (CHAPLA ONAPC). No petro-like sheen in

Notes:
MP = top of PVC Iwell vol. = ~1.3 gal r=.5 h=~31' Barometric pressure: 756.4 mm Hg
Change in rock @ ~31' bgs; several FID readings also at this interval
(Targeted pump intake to above) TD = ~45' (below ground) ~46.5' (below PVC)

Analysis	Bottle Lot#	Analysis	Bottle Lot #	Analysis	Bottle Lot #
VOC		TAL metals			
SVOC		Dis. Metals			
Pest/PCB					

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cum. Volume Purged liters	Temp °C	Spec. Cond. 2 µS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
1150	16.24	CPM 4 10/5	60	Filling tubing and flow cell							~25 psi
1155	16.25	CPM 6 5/5	85	"							~30 psi
1215	16.27	CPM 6 5/5	85		15.76	0.326	6.81	273.3	1.33	2.2	
1225	16.28	CPM 6 5/5	85		15.73	0.323	6.75	385.4	0.81	1.57	
1235	16.29	CPM 6 5/5	80		15.82	0.321	6.76	424.9	0.53	0.12	
1245	16.29	CPM 6 5/5	80		15.55	0.319	6.76	442.2	0.54	0.57	
1255	16.29	CPM 6 5/5	85		15.62	0.317	6.77	451.1	0.40	0.00	
1301	16.29	CPM 6 5/5	85		15.58	0.317	6.78	455.2	0.39	0.00	
1307	16.29	CPM 6 5/5	85		15.61	0.316	6.77	460.0	0.36	0.00	
1313	16.29	CPM 6 5/5	85		15.29	0.316	6.78	463.3	0.35	0.00	
1319	16.29	CPM 6 5/5	85		15.32	0.315	6.80	446.0	0.35	0.00	* restarted YSI + ORP reading dropped
1325+1331		Missed reading - getting room protection for instruments + self									hamming
1337	16.29	CPM 6 5/5	85		15.26	0.316	6.80	459.0	0.33	0.00	
1343	16.29	CPM 6 5/5	85		15.36	0.312	6.80	462.6	0.32	0.00	
1349	16.29	CPM 6 5/5	85		15.33	0.315	6.80	463.8	0.32	0.00	
End purge - collected next per work plan											

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

Tt NUS Form 0009

- PM weather - overcast, low 70s, humid, breezy, scattered heavy showers
- Increased time btwn readings to ensure H2O in flow cell fully exchanges
- CPM = cycles per minute. Refill = 5 sec Discharge = 5 sec (5/5)

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - SOLID PHASE

Site Name: DUSC Disposal Area SA-05
Sample ID: DA-5-SD01-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: none (if applicable)

Sample Method: Direct Scoop
Depth Sampled: 0.5 feet
Sample Date & Time: 7/30/03 1220 hours Dup — hours
Sampler(s): L. Seydewitz, K. O'Neill

Data Recorded By: [signature] Signature

PID/OVA Monitor Reading: none recorded. ppm

TYPE OF SAMPLE: (Check all that apply)

- ___ Soil
- X Sediment
- ___ Lagoon/Pond
- X Grab
- ___ Trip Blank*
- ___ Rinsate Blank*
- ___ Field Duplicate collected
- ___ Other (Specify): ___

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) sandy silt (fine-medium sand)

SAMPLE DATA/REMARKS:

ANALYSIS	BOTTLE LOT NO.

NOTES/SKETCH:

- Sample collected upstream of culvert (~ 40')
- Very minimal water flowing over location at time of sampling

Tt NUS Form 0005A

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - SOLID PHASE

Site Name: DUSC Disposal Area SA-08
Sample ID: ~~DA-S-SD002-02~~ DA-S-SD02-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: DA-S-SD-DUP01-01 (if applicable)

Sample Method: Direct Scoop
Depth Sampled: 0.5 feet
Sample Date & Time: 7/30/03 1120 hours Dup 1130 hours
Sampler(s): L. Seydewitz, K'O'Neill

Data Recorded By: L. Seydewitz
Signature

PID/OVA Monitor Reading: not recorded ppm

TYPE OF SAMPLE: (Check all that apply)

- ___ Soil
- X Sediment
- ___ Lagoon/Pond
- X Grab
- ___ Trip Blank*
- ___ Rinsate Blank*
- X Field Duplicate collected
- ___ Other (Specify): ___

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) ~~silty~~ sandy silt, wet, brown

SAMPLE DATA/REMARKS:

ANALYSIS	BOTTLE LOT NO.

NOTES/SKETCH:
- Located approx 60' from confluence (upstream)
- The location has about 2' of water and is located at a bend in the stream.

Tt NUS Form 0005A

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - SOLID PHASE

Site Name: NUSC Disposal Area SA-08
Sample ID: DA-S-SD03-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: none (if applicable)

Sample Method: Direct Scoop (Grab)
Depth Sampled: 0.5 feet
Sample Date & Time: 7/30/03 0830 hours Dup — hours
Sampler(s): L. Seydewitz, K. O'Neill

Data Recorded By: L. Seydewitz
Signature

PID/OVA Monitor Reading: none recorded ppm

TYPE OF SAMPLE: (Check all that apply)

___	Soil	___	Trip Blank*
X	Sediment	___	Rinsate Blank*
___	Lagoon/Pond	___	Field Duplicate collected
X	Grab	___	Other (Specify): ___

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) sand w/ some silt, brown in color

SAMPLE DATA/REMARKS:

ANALYSIS	BOTTLE LOT NO.

NOTES/SKETCH:
Located approx. 15' from confluence

Tt NUS Form 0005A

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - SOLID PHASE

Site Name: DUSC Disposal Area SA-08
Sample ID: DA-S-SD04-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: none (if applicable)

Sample Method: Direct Scoop
Depth Sampled: 0.5 feet
Sample Date & Time: 7/31/03 1310 hours Dup — hours
Sampler(s): L. Seydewitz, K. O'Neill

Data Recorded By: L. Seydewitz
Signature

PID/OVA Monitor Reading: none recorded ppm

TYPE OF SAMPLE: (Check all that apply)

___	Soil	___	Trip Blank*
X	Sediment	___	Rinsate Blank*
___	Lagoon/Pond	___	Field Duplicate collected
X	Grab	___	Other (Specify): ___

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) sandy silt

SAMPLE DATA/REMARKS:

ANALYSIS	BOTTLE LOT NO.

NOTES/SKETCH:
- at mouth of 30" culvert
- there are numerous larger pieces of gravel here; the bank has been eroded away in places; minimal amt of sand/silt etc at this location
- located directly on side of road (~10' from dirt road)

Tt NUS Form 0005A

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - SOLID PHASE

Site Name: NUSC Disposal Area SA-08
Sample ID: DA-S-SD05-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: none (if applicable)

Sample Method: Direct Scoop
Depth Sampled: 0.5 feet
Sample Date & Time: 7/30/03 1015 hours Dup — hours
Sampler(s): L. Seydewitz, K. O'Neill

Data Recorded By: L. Seydewitz
Signature

PID/OVA Monitor Reading: not recorded ppm

TYPE OF SAMPLE: (Check all that apply)

___	Soil	___	Trip Blank*
X	Sediment	___	Rinsate Blank*
___	Lagoon/Pond	___	Field Duplicate collected
X	Grab	___	Other (Specify): ___

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) Sand w/ gravel (trace), brown moist

SAMPLE DATA/REMARKS:

ANALYSIS	BOTTLE LOT NO.

NOTES/SKETCH:
Located approx. 15' upstream of confluence

Tt NUS Form 0005A

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - SOLID PHASE

Site Name: DUSC Disposal Area SA-08
Sample ID: DA-~~S~~-SD06-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: none (if applicable)

Sample Method: Direct grab w/ scoop
Depth Sampled: 0.5 feet
Sample Date & Time: 2/29/03 1455 hours Dup — hours
Sampler(s): L. Seydewitz, K. O'Neill

Data Recorded By: L. Seydewitz
Signature

PID/OVA Monitor Reading: none recorded ppm

TYPE OF SAMPLE: (Check all that apply)

- ___ Soil
- X Sediment
- ___ Lagoon/Pond
- X Grab (VOCs)
- ___ Trip Blank*
- ___ Rinsate Blank*
- ___ Field Duplicate collected
- ___ Other (Specify): ___

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) sandy silt, light brown

SAMPLE DATA/REMARKS: Photo taken (disposable) (2 pictures taken)
area is mostly sand & gravel deposition

ANALYSIS	BOTTLE LOT NO.

NOTES/SKETCH:
Located approx. 25' from head of ~~stre~~ x1 pond

Tt NUS Form 0005A

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - SOLID PHASE

Site Name: DUSC Disposal Area SA-08
Sample ID: DA-S-SD02-01

Tetra Tech NUS Charge No. 8356-0550
QC Information: no/msd (if applicable)

Sample Method: Direct Grab w/ scoop
Depth Sampled: 0.5 feet
Sample Date & Time: 2/29/03 1430 hours Dup — hours
Sampler(s): L. Seydewitz, K. O'Neill

Data Recorded By: L. Seydewitz
Signature

PID/OVA Monitor Reading: not recorded ppm
(did not take w/ us in boat)

TYPE OF SAMPLE: (Check all that apply)

- ___ Soil
- X Sediment
- ___ Lagoon/Pond
- X Grab
- ___ Trip Blank*
- ___ Rinsate Blank*
- ___ Field Duplicate collected
- ___ Other (Specify): ___

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) partially decayed plant matter, organic mucky sand (fine sand) with silt, dark brown

SAMPLE DATA/REMARKS: Removed about 1" decaying vegetation before getting sediment for sample

ANALYSIS	BOTTLE LOT NO.	NOTES/SKETCH:

Tt NUS Form 0005A

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - SOLID PHASE

Site Name: NUSC Disposal Area SA-08
Sample ID: DA-S-SD08-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: none (if applicable)

Sample Method: Ponar Grab
Depth Sampled: 0.5 feet
Sample Date & Time: 7/29/03 1115 hours Dup — hours
Sampler(s): L. Seydewitz, K. O'Neill

Data Recorded By: L. Seydewitz
Signature

PID/OVA Monitor Reading: no reading ppm
(none recorded when on boat)

TYPE OF SAMPLE: (Check all that apply)

___	Soil	___	Trip Blank*
X	Sediment	___	Rinsate Blank*
___	Lagoon/Pond	___	Field Duplicate collected
X	Grab	___	Other (Specify): ___

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) brown/green mucky organic silt,

SAMPLE DATA/REMARKS:

ANALYSIS	BOTTLE LOT NO.

NOTES/SKETCH:
Located approx. center of pond (~150 from outfall)

Tt NUS Form 0005A

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - SOLID PHASE

Site Name: NUSC Disposal Area SA-08
Sample ID: DA-S-SD09-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: None (if applicable)

Sample Method: Ponar Grab
Depth Sampled: 0.5 feet
Sample Date & Time: 7/29/03 1100 hours Dup — hours
Sampler(s): L. Seyfenwitz, K. O'Neill

Data Recorded By: L. Seyfenwitz
Signature

PID/OVA Monitor Reading: not recorded ppm
(couldn't fit on boat)

TYPE OF SAMPLE: (Check all that apply)

___	Soil	___	Trip Blank*
X	Sediment	___	Rinsate Blank*
___	Lagoon/Pond	___	Field Duplicate collected
X	Grab	___	Other (Specify): ___

Description: (Sand, Clay, Muck, Peat, Dry, Moist, Wet, Etc.) organic muck (grey/dark)
sulfide odor, anaerobic (?)

SAMPLE DATA/REMARKS:

ANALYSIS	BOTTLE LOT NO.

NOTES/SKETCH:
Located approx. 15 feet from outfall

Tt NUS Form 0005A

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - LIQUID PHASE

Site Name: DUSC Disposal Site SA-08
Sample ID: DA-A-SL001-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: none (if applicable)

Sample Method/Device: Direct Dip (Grab)
Depth Sampled: 0.6 feet Total Depth 1.0 feet (SW Only)
Sample Date & Time: 7/31/03 1215 hours
Sampler(s): L. Seydewitz, K O'Neill

Recorded By: L. Seydewitz K O'Neill
Signature

TYPE OF SAMPLE: (Check all that apply)

- ___ Groundwater
- X Surface Water
- ___ Residential Supply
- X Grab
- ___ Composite
- ___ Trip Blank*
- ___ Rinsate Blank*
- ___ Field Duplicate Collected
- ___ Other (Specify):

* include sample source & lot No.

WELL PURGE DATA:

Well Depth	feet	Purge Start	hrs
Well Diameter	Inches	Purge Stop Time	hrs
Water Level	feet	Total Gallons Purged	
Well Volume	gal.	Purge Method	

LL 7/31/03

Color: _____ Turbidity: CLR/SL CLDY/CLDY/OPAQ

Micro Tip/OVA Monitor Reading: ppm

Sampling/Purge Data:

Vol. #	Temp °C	pH	turb	Spec. Cond. mS/cm	Sal	DO
0	17.54	6.60	129.0	0.565	0.0	8.12
1						
3						
4						

ANALYSIS	BOTTLE LOT NO.	TRAFFIC REPORT NO.		COMMENTS
		ORGANIC	INORGANIC	

TtNUS Form 0004

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - LIQUID PHASE

Site Name: DUSC Disposal Area SA-08
Sample ID: DA-A-SW02-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: ~~DA-A-DUP01-01 @ 02~~ DA-A-SW-DUP01-01 (if applicable)

Sample Method/Device: Direct Dip (Grab)
Depth Sampled: 1 feet Total Depth ~1.5 feet (SW Only)
Sample Date & Time: 7/30/03 1120 hours
Sampler(s): L. Seydewitz, K. O'Neill

Recorded By: L. Seydewitz
Signature

TYPE OF SAMPLE: (Check all that apply)

- ___ Groundwater
- X Surface Water
- ___ Residential Supply
- X Grab
- ___ Composite
- ___ Trip Blank*
- ___ Rinsate Blank*
- (1130) X Field Duplicate Collected
- ___ Other (Specify):

* include sample source & lot No.

WELL PURGE DATA:

Well Depth	feet	Purge Start	hrs
Inside Diameter	Inches	Purge Stop Time	hrs
Water Level	feet	Total Gallons Purged	
Well Volume	gal.	Purge Method	

LL 7/30/03

Color: no color Turbidity: CLR/SL CLDY/CLDY/OPAQ

Micro Tip/OVA Monitor Reading: ppm

Sampling/Purge Data:

Vol. #	Temp °C	pH	Turbidity	Spec. Cond.	DO
0	18.40	2.39	90.4	0.544	9.69
1					
3					
4					

ANALYSIS	BOTTLE LOT NO.	TRAFFIC REPORT NO. ORGANIC	TRAFFIC REPORT NO. INORGANIC	COMMENTS
				• located in bend in stream
				• water is clear (can see bottom)

TtNUS Form 0004

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - LIQUID PHASE

Site Name: NUSC Disposal Area JA-08
Sample ID: DA-A-56203-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: none (if applicable)

Sample Method/Device: Direct Dip
Depth Sampled: 3" ~~feet~~ Total Depth 4" ~~feet~~ (SW Only)
Sample Date & Time: 7/30/03 0840 hours
Sampler(s): L. Seydewitz, K. O'Neill

Recorded By: [signature]
Signature

TYPE OF SAMPLE: (Check all that apply)

- ___ Groundwater
- X Surface Water
- ___ Residential Supply
- X Grab
- ___ Composite
- ___ Trip Blank*
- ___ Rinsate Blank*
- ___ Field Duplicate Collected
- ___ Other (Specify):

* include sample source & lot No.

WELL PURGE DATA:

Well Depth	feet	Purge Start	~~hrs~~
Inside Diameter	Inches	Purge Stop Time	hrs
Water Level	feet	Total Gallons Purged	
Well Volume	gal.	Purge Method	

[illegible] 7/30/03

Color: no color Turbidity: CLR/SL CLDY/CLDY/OPAQ

Micro Tip/OVA Monitor Reading: ppm

Sampling/Purge Data:

Vol. #	Temp °C	pH	Turbidity	Spec. Cond.	DO
0	18.41	6.40	84.2	0.526	9.37
1					
3					
4					

ANALYSIS	BOTTLE LOT NO.	TRAFFIC REPORT NO. ORGANIC	TRAFFIC REPORT NO. INORGANIC	COMMENTS
				• located in shaded area
				• clear (can see bottom)
				• minimal water flow

TtNUS Form 0004

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - LIQUID PHASE

Site Name: DUSC Disposal Area SA-08
Sample ID: DA-A-SW04-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: none (if applicable)

Sample Method/Device: Direct Dip
Depth Sampled: 0.8 feet Total Depth 0.8 feet (SW Only)
Sample Date & Time: 7/31/03 1259 hours
Sampler(s): L. Seydewitz, K. O'Neill

Recorded By: L. Seydewitz
Signature

TYPE OF SAMPLE: (Check all that apply)

- ___ Groundwater
- X Surface Water
- ___ Residential Supply
- X Grab
- ___ Composite
- ___ Trip Blank*
- ___ Rinsate Blank*
- ___ Field Duplicate Collected
- ___ Other (Specify):

* include sample source & lot No.

WELL PURGE DATA:

Well Depth	feet	Purge Start	hrs
Inside Diameter	Inches	Purge Stop Time	hrs
Water Level	feet	Total Gallons Purged	
Well Volume	gal.	Purge Method	

RS 7/31/03

Color: no color Turbidity: CLR/SL CLDY/CLDY/OPAQ

Micro Tip/OVA Monitor Reading: ppm

Sampling/Purge Data:

Vol. #	Temp °C	pH	Turbidity	Spec. Cond.	DO
0	28.01	2.27	105.0	0.320	9.96
1					
3					
4					

ANALYSIS	BOTTLE LOT NO.	TRAFFIC REPORT NO. ORGANIC	TRAFFIC REPORT NO. INORGANIC	COMMENTS
				~3 gal/min
				- mouth of 30" wide (diameter) culvert
				- sample area is shaded but water is
				flowing from golf course on opposite
				side of road (in direct sun as flows slowly
				to site)

TtNUS Form 0004

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - LIQUID PHASE

Site Name: NUSC Disposal Area SA-08
Sample ID: DA-A-SW05-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: none (if applicable)

Sample Method/Device: Direct Dip (Grab)
Depth Sampled: 4" ~~feet~~ Total Depth 4" ~~feet~~ (SW Only)
Sample Date & Time: 7/30/03 1000 hours
Sampler(s): L. Seydewitz, K. O'Neill

Recorded By: L. Seydewitz
Signature

TYPE OF SAMPLE: (Check all that apply)

- ___ Groundwater
- X Surface Water
- ___ Residential Supply
- X Grab
- ___ Composite
- ___ Trip Blank*
- ___ Rinsate Blank*
- ___ Field Duplicate Collected
- ___ Other (Specify):

* include sample source & lot No.

WELL PURGE DATA:

Well Depth	feet	Purge Start	hrs
Inside Diameter	Inches	Purge Stop Time	hrs
Water Level	feet	Total Gallons Purged	
Well Volume	gal.	Purge Method	

LS 7/30/03

Color: no color Turbidity: CLR/SL CLDY/CLDY/OPAQ

Micro Tip/OVA Monitor Reading: ppm

Sampling/Purge Data:

Vol. #	Temp °C	pH	Turbidity	Spec. Cond.	DO
0	18.62	7.27	76.5	0.539	9.06
1					
3					
4					

ANALYSIS	BOTTLE LOT NO.	TRAFFIC REPORT NO. ORGANIC	TRAFFIC REPORT NO. INORGANIC	COMMENTS
				• located in shaded area
				• clear (can see bottom)
				• minimal water flow

TtNUS Form 0004

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - LIQUID PHASE

Site Name: DUSC Disposal Area SA-08
Sample ID: DA-A-SW06-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: none (if applicable)

Sample Method/Device: Direct Dip
Depth Sampled: 0.2 feet Total Depth 0.5 feet (SW Only)
Sample Date & Time: 7/29/03 1445 hours
Sampler(s): L. Seydewitz, K. O'Neill

Recorded By: L. Seydewitz
Signature

TYPE OF SAMPLE: (Check all that apply)

- ___ Groundwater
- X Surface Water
- ___ Residential Supply
- X Grab
- ___ Composite
- ___ Trip Blank*
- ___ Rinsate Blank*
- ___ Field Duplicate Collected
- ___ Other (Specify):

* include sample source & lot No.

WELL PURGE DATA:

Well Depth	feet	Purge Start	hrs
Inside Diameter	Inches	Purge Stop Time	hrs
Water Level	feet	Total Gallons Purged	
Well Volume	gal.	Purge Method	

LS 7/29/03

Color: light brown Turbidity: CLR/SL CLDY/CLDY/OPAQ

Micro Tip/OVA Monitor Reading: ppm

Sampling/Purge Data:

Vol. #	Temp °C	pH	Turbidity	Spec. Cond.	DO
0	19.78	7.27	97.1	0.488	8.18
1					
3					
4					

ANALYSIS	BOTTLE LOT NO.	TRAFFIC REPORT NO. ORGANIC	TRAFFIC REPORT NO. INORGANIC	COMMENTS
				• located in shaded area
				• photo taken (2)

TtNUS Form 0004

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - LIQUID PHASE

Site Name: NUSC Disposal Area SA-08
Sample ID: DA-A-SW02-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: MS/MSD (if applicable)

Sample Method/Device: Direct Dip
Depth Sampled: 0.5 feet Total Depth 0.8 feet (SW Only)
Sample Date & Time: 7/29/03 1415 hours
Sampler(s): L. Seydewitz, K. O'Neill

Recorded By: L. Seydewitz
Signature

TYPE OF SAMPLE: (Check all that apply)

- ___ Groundwater
- X Surface Water
- ___ Residential Supply
- X Grab
- ___ Composite
- ___ Trip Blank*
- ___ Rinsate Blank*
- ___ Field Duplicate Collected
- X Other (Specify): MS/MSD

* include sample source & lot No.

WELL PURGE DATA:

Well Depth	feet	Purge Start	hrs
Inside Diameter	Inches	Purge Stop Time	hrs
Water Level	feet	Total Gallons Purged	
Well Volume	gal.	Purge Method	

LL 7/29/03

Color: light brown Turbidity: CLR/SL CLDY/CLDY/OPAQ

Micro Tip/OVA Monitor Reading: ppm

Sampling/Purge Data:

Vol. #	Temp °C	pH	Turbidity	Spec. Cond.	DO
0	28.51	6.29	20.9	0.313	8.11
1					
3					
4					

ANALYSIS	BOTTLE LOT NO.	TRAFFIC REPORT NO.		COMMENTS
		ORGANIC	INORGANIC	

TtNUS Form 0004

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - LIQUID PHASE

Site Name: NUSC Disposal Area SA-08
Sample ID: DA-A-SA08-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: none (if applicable)

Sample Method/Device: Kemmerer
Depth Sampled: 4 feet Total Depth 2.7' feet (SW Only)
Sample Date & Time: 7/29/03 1110 hours
Sampler(s): L. Seydewitz, K. O'Neill

Recorded By: L. Seydewitz
Signature

TYPE OF SAMPLE: (Check all that apply)

- ___ Groundwater
- X Surface Water
- ___ Residential Supply
- X Grab
- ___ Composite
- ___ Trip Blank*
- ___ Rinsate Blank*
- ___ Field Duplicate Collected
- ___ Other (Specify):

* include sample source & lot No.

WELL PURGE DATA:

Well Depth	feet	Purge Start	hrs
Inside Diameter	Inches LS 7/29/03	Purge Stop Time	hrs
Water Level	feet	Total Gallons Purged	
Well Volume	gal.	Purge Method	

Color: no color/brown Turbidity: CLR/SL CLDY/CLDY/OPAQ

Micro Tip/OVA Monitor Reading: N/A ppm

Sampling/Purge Data:

Vol. #	Temp °C	pH	Turbidity	Spec. Cond.	DO
0	23.62	6.9	83.5	0.334	3.14
1					
3					
4					

ANALYSIS	BOTTLE LOT NO.	TRAFFIC REPORT NO.		COMMENTS
		ORGANIC	INORGANIC	

TtNUS Form 0004

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - LIQUID PHASE

Site Name: NUSC Disposal Area: SA-08
Sample ID: DA-A-SW09-01

Tetra Tech NUS Charge No. 8856-0550
QC Information: None (if applicable)

Sample Method/Device: Kemmerer
Depth Sampled: 7 feet Total Depth 9.6 feet (SW Only)
Sample Date & Time: 7/29/03 1050 hours
Sampler(s): L. Seydewitz, K. O'Neill

Recorded By: L. Seydewitz
Signature

TYPE OF SAMPLE: (Check all that apply)

- ___ Groundwater
- X Surface Water
- ___ Residential Supply
- X Grab
- ___ Composite
- ___ Trip Blank*
- ___ Rinsate Blank*
- ___ Field Duplicate Collected
- ___ Other (Specify):

* include sample source & lot No.

WELL PURGE DATA:

Well Depth	feet	Purge Start	hrs
Inside Diameter	Inches	Purge Stop Time	hrs
Water Level	feet	Total Gallons Purged	
Well Volume	gal.	Purge Method	

LL 7/29/03

Color: no color/cloudy Turbidity: CLR/SL CLDY/CLDY/OPAQ

Micro Tip/OVA Monitor Reading: ppm

Sampling/Purge Data:

Vol. #	Temp °C	pH	Turbidity	Spec. Cond.	DO
0	21.4	6.61	158.0	0.292	4.8 mg/L
1					
3					
4					

Notes: Total Depth 9.6'

ANALYSIS	BOTTLE LOT NO.	TRAFFIC REPORT NO. ORGANIC	TRAFFIC REPORT NO. INORGANIC	COMMENTS
				The pond looks brown in color (cannot see bottom)

TtNUS Form 0004

TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No.

Subcontract No. Steve Parker 978/658-7899

Project No. 8856-0550

Laboratory Name: Alpha Analytical Laboratory

Sampler Signatures: Lauren Szydlowski

Date Shipped: 7/30/03

~~Airbill No.~~ N/A

Carrier: Hand Delivered by Courier

No. of Coolers: 5

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: VOA Vial	Container Type: 1000 ml Amber	Container Type: 1000 ml Amber	Container Type: 500 ml Plastic	Container Type: 500 ml Plastic
						Analysis: VOCs	Analysis: SVOCs	Analysis: Pest/PCBs	Analysis: TAL Metals	Analysis: Dissolved Metals
						Preservative: HCL and ice	Preservative: Ice	Preservative: Ice	Preservative: HNO_3 and ice	Preservative: HNO_3 and ice
~~DA-A-SW09-01~~ 7/30/03	SW	7/29/03/1050	DA-A-SW09-01			2	1	1	1	1
		7/29/03/1110	DA-A-SW08-01			2	1	1	1	1
		7/29/03/1415	DA-A-SW07-01		LA	7/30/03 2 6	3	3	2	2
		7/29/03/1445	DA-A-SW06-01			2	2	2	1	1
		7/30/03/0840	DA-A-SW03-01			2	2	2	1	1
		7/30/03/1000	DA-A-SW05-01			2	2	2	1	1
		7/30/03/1130	DA-A-SW02-01		Dup	2	2	2	1	1
		7/30/03/1130	DA-A-SW-DUP01-01		Dup	2	2	2	1	1
	AQ	7/25/03/1030	* DA-A-TB01-01		B(T)	1	—	—	—	—
	AQ	7/24/03/1700	* DA-A-TB02-01		B(T)	1	—	—	—	—
	AQ	7/30/03/1570	DA-A-SW08-RB01-01		B(E)	2	2	2	1	1

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
Lauren Szydlowski	7/30/03	[illegible]	YES / NO (NO circled)	*Trip Blank prepared by lab
Relinquished By: (Signature)	**Date/Time**	**Received for Laboratory By:**	**Date/Time**	

Tt NUS Form 0022

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No.

Page 2 of 2

Subcontract No. Steve Parker 978-658-7899

Project No. 8856-0550

Laboratory Name: Alpha Analytical Laboratory

Sampler Signatures: L. Sagolnt

Date Shipped: 7/30/03

Airbill No.: N/A

Carrier: Courier

No. of Coolers: 5

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40 ml VOA vial	Container Type: 40 ml VOA vial	Container Type: Glass 250 ml	Container Type: Glass 250 ml	Container Type:
						Analysis: VOCs (Low)	Analysis: VOCs (High)	Analysis: SVOCs, Pest/PCBs, ~~TAL Metals~~	Analysis: TOC, Grain Size, ~~AVS/SEM~~	Analysis:
						Preservative: Reagent H_2O/Ice	Preservative: MeOH	Preservative: Ice	Preservative: Ice	Preservative:
	SD	7/29/03/1100	DA-S-SD09-01			2	1	1	1	
		7/29/03/1115	DA-S-SD08-01			2	1	1	1	
		7/29/03/1430	DA-S-SD07-01		LAB QC	6	3	3	3	
		7/29/03/1445	DA-S-SD06-01			2	1	1	1	
		7/30/03/0830	DA-S-SD03-01			2	1	1	1	
		7/30/03/1015	DA-S-SD05-01			2	1	1	1	
		7/30/03/1120	DA-S-SD02-01		D1	2	1	1	1	
		7/30/03/1130	DA-S-SD-DUP01-01		D1	2	1	1	1	
	liquid	7/25/03/1139/1140	*DA-S-TB01-01			2	2	—	—	

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
L. Sagolnt	7/30/03	[illegible]	YES / NO	*Trip Blanks prepared by lab.
Relinquished By: (Signature)	Date/Time	Received for Laboratory By:	Date/Time	

Tt NUS Form 0022

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No.

Subcontract No.

Page 1 of 2

Project No.: 8856-0550

Laboratory Name: Alpha Analytical Labortory

Sampler Signatures: L. Zegalski

Date Shipped: 7/31/03

Airbill No.: N/A

Carrier: Lab Courier

No. of Coolers: 2

Steve Parker

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: Voa Vial	Container Type: 1000 ml Amber	Container Type: 1000 ml Amber	Container Type: 500 ml Plastic	Container Type: 500 ml Plastic
						Analysis: VOCs	Analysis: SVOCs	Analysis: Pest/PCBs	Analysis: TAL Metals	Analysis: Dissolved Metals
						Preservative: HCL and ice	Preservative: Ice	Preservative: Ice	Preservative: HNO_3 and ice	Preservative: HNO_3 and ice
	SLD	7/31/03/1215	DA-A-SLD01-01			2	2	2	1	1
	SLD	7/31/03/1259	DA-A-SLD04-01			2	2	2	1	1
	AQ	7/30/03/1630	DA-S-SD02-RB01-01			2	2	2	1	—
	AQ	7/31/03/0845	DA-S-SD02-RB02-01			2	2	2	1	—
	AQ	7/31/03/1440	DA-S-TB02-01			2	—	—	—	—

LZ 7/31/03

LZ 7/31/03

LZ 7/31/03

LZ 7/31/03

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
Lauren Zegalski	7/31/03 1620	Don Nelson	YES NO	
Relinquished By: (Signature)	**Date/Time**	**Received for Laboratory By:**	**Date/Time**	

Tt NUS Form 0022

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No.

Page 2 of 2

Subcontract No.
Steve Parker 978-658-7899

Project No.
8856-0550

Laboratory Name:
Alpha Analytical Labortory

Sampler Signatures
L. Leyshut

Date Shipped
7/31/03

~~Airbill No.~~
N/A

Carrier
Lab Courier

No. of Coolers
2

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40 ml Voa vial	Container Type: 40 ml Voa vial	Container Type: Glass 250 ml	Container Type: Glass 250 ml	Container Type
						Analysis: VOCs (Low)	Analysis: VOCs (high)	Analysis: SVOCs, Pest/PCBs TAL Metals	Analysis: TOC Grain Size AVS/SEM	Analysis
						Preservative: Reagent H_2O and ice	Preservative: MeOH and ice	Preservative: Ice	Preservative: Ice	Preservative
	SD	7/31/03/1220	DA-S-SD01-01			2	1	1	1	
	SD	7/31/03/1310	DA-S-SD04-01			2	1	1	1	

LL 7/31/03

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
Lawrence Leyshut	7/31/03 1620	[illegible]	YES NO	
Relinquished By: (Signature)	**Date/Time**	**Received for Laboratory By:**	**Date/Time**	

Tt NUS Form 0022

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No.

Page 1 of 2

Subcontract No. Steve Parker @ 978-658-7899

Project No. NUSC Disposal Area N8856-0530

Laboratory Name: Alpha Analytical Laboratory

Sampler Signatures: L. Sugdut

Date Shipped: 8/12/03
~~Airbill No.~~ hand delivered

Carrier: Courier
No. of Coolers: 2

Container Type	Container Type	Container Type	Container Type	Container Type
40ml amber voa	40ml amber voa	250ml amber		
Analysis	**Analysis**	**Analysis**	**Analysis**	**Analysis**
VOCs (Low)	VOCs (High) GRO	SVOCs/ Pest/PCBs TAL Metals, DRO		
Preservative	**Preservative**	**Preservative**	**Preservative**	**Preservative**
water/ ice	MeOH/ ice	ice		

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type 1	Container Type 2	Container Type 3	Container Type 4	Container Type 5
	SO	8/11/03/1200	DA-S-TP01-0001-01 **			2	1	1		
		8/11/03/1140	DA-S-TP01-0304-01 **			2	1	1		
		8/11/03/1130	DA-S-TP01-0607-01 **			2	1	1		
		8/11/03/1545	DA-S-TP05-0001-01 **			2	1	1		
		8/11/03/1445	DA-S-TP05-0607-01			2	1	1		
		8/11/03/1515	DA-S-TP05-0910-01		Dup01	2	1	1		
		8/11/03/1520	DA-S-TP-DUP01-01 **		Dup01	2	1	1		
		8/12/03/1000	DA-S-TP15-0001-01			2	1	1		
		8/12/03/0950	DA-S-TP15-0203-01			2	1	1		
		8/12/03/0940	DA-S-TP15-0506-01			2	1	1		
		8/12/03/1245	DA-S-~~TP05~~-TP07-0001-01			2	1	1		
		8/12/03/1230	DA-S-TP07-0304-01			2	1	1		

8/12/03

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
Lauren Sugdut	8/12/03 1720	Steve Walker	YES (NO)	* Please freeze water voas upon receipt to lab. ** Please add .56g to these to account for tape. (oops!!)
Relinquished By: (Signature)	**Date/Time**	**Received for Laboratory By:**	**Date/Time**	
			8/12/03	

Tt NUS Form 0022

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No.

Page 2 of 2

Subcontract No.
Steve Parker @ 978-658-7899

Project No.
NUSC Disposal Area
N8856-0530

Laboratory Name:
Alpha Analytical Labortory

Sampler Signatures
L. Seydel

Date Shipped
8/12/03

Carrier
courier

~~Airbill No.~~
hand delivered

No. of Coolers
2

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40 ml amber voa	Container Type: 40 ml amber voa	Container Type: 250 ml amber	Container Type	Container Type
						Analysis: VOCs (low)	Analysis: VOCs (high), GRO	Analysis: SVOCs, Pest/PCBs, TAL metals, DRO	Analysis	Analysis
						Preservative: water/ice	Preservative: MeOH/ice	Preservative: ice	Preservative	Preservative
	SO	8/12/03/1140	DA-S-TP07-0910-01			2	1	1		
		8/12/03/1445	DA-S-TP15A-0506-01			2	1	1		
		8/12/03/1435	DA-S-TP15A-0910-01			2	1	1		
		8/12/03/1335	DA-S-TP15A-0203-01			2	1	1		
	A	7/24/03/1245	DA-S-TP-TB01-01			1*	1	–		
	A	7/25/03/1030	DA-S-TP-TB02-01			1	–	–		

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
Lauren Seydel	8/12/03 1720	Steve Walcott	YES NO	* Please freeze water voas upon receipt to lab.
Relinquished By: (Signature)	Date/Time	Received for Laboratory By:	Date/Time 8/12/03	

Tt NUS Form 0022

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No.

Page 1 of 4

Subcontract No.
Steve Parker 978-658-2899

Project No.
NUSC Disposal Area
N8856-0530

Laboratory Name:
Alpha Analytical Labortory

Sampler Signatures
L. Sergeant

Date Shipped
8/14/03

Carrier
courier

Airbill No.
hand delivered

No. of Coolers
3

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40 ml amber voa	Container Type: 40 ml amber voa	Container Type: 250 ml amber	Container Type	Container Type
						Analysis: VOCs (low)	Analysis: VOCs (high), GRO	Analysis: SVOCs, Pest/PCBs, TAL Metals, DRO	Analysis	Analysis
						Preservative: water/ice	Preservative: MeOH/ice	Preservative: ice	Preservative	Preservative
	SO	8/14/03/0720	DA-S-TP11-0001-01			2	1	1		
		0910	DA-S-TP11-0203-01		Dup3	2	1	1		
		~~0915~~	~~DA-S-TP-DUP03-01~~		~~Dup3~~	~~2~~	~~1~~	~~1~~		
		0850	DA-S-TP11-0304-01			2	1	1		
		1310	DA-S-TP14-0001-01			2	1	1		
		1200	DA-S-TP14-0506-01			2	1	1		
		1150	DA-S-TP14-0910-01		MS/MSD	~~2~~ 6	3	3		
		1410	DA-S-TP09-0001-01			2	1	1		
		1350	DA-S-TP-DUP04-01		Dup4	2	1	1		
		1345	DA-S-~~TP~~-TP09-0102-01		Dup4	2	1	1		
		1500	DA-S-TP10-0001-01			2	1	1		
		1455	DA-S-TP10-0102-01			2	1	1		
	8/14/03		8/14/03				8/14/03			

8/14/03

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
L. Sergeant	8/14/03 1645		YES NO	
Relinquished By: (Signature)	**Date/Time**	**Received for Laboratory By:**	**Date/Time**	

Tt NUS Form 0022

02884

TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No.

Page 2 of 4

Subcontract No.
Steve Parker 987-658-7899

Project No.
NUSC Disposal Area
N8856-0530

Laboratory Name:
Alpha Analytical Laboratory

Sampler Signatures
L. Seydlitz

Date Shipped
8/14/03

Carrier
Courier

Airbill No.
hand delivered

No. of Coolers
3

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40 ml voa	Container Type: 40 ml voa	Container Type: 250 ml amber	Container Type	Container Type
						Analysis: VOCs (low)	Analysis: VOCs (high), GRO	Analysis: SVOCs Pest/PCBs TAL Metals DRO	Analysis	Analysis
						Preservative: water/ice	Preservative: MeOH/ice	Preservative: ice	Preservative	Preservative
	SO	8/13/03 1015	DA-S-TP06-0001-01			2	1	1		
		1005	DA-S-TP06-0304-01		ms/msd	6	3	3		
		0950	DA-S-TP06-0910-01			2	1	1		
		1255	* DA-S-TP02-0001-01			2	1	1		
		1245	* DA-S-TP02-0203-01		Dup2	2	1	1		
		1250	* DA-S-TP-DUP02-01		Dup 2	2	1	1		
		1230	* DA-S-TP02-0506-01			2	1	1		
		1315	* DA-S-TP02-0102-01			2	1	1		
		1525	DA-S-TP12-0001-01			2	1	1		
		1515	DA-S-TP12-0102-01			2	1	1		
		1505	DA-S-TP12-0203-01			2	1	1		
	AQ	7/25/03 1030	DA-S-TP-TB03-01			1	-	-		

8/14/03 LS 8/14/03 LS 8/14/03 LS

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
Lauren Seydlitz	8/14/03 1645	[signature]	YES NO	* These samples contain a tarlike substance. ** Please analyze for soil AND tar.
Relinquished By: (Signature)	**Date/Time**	**Received for Laboratory By:**	**Date/Time**	

Tt NUS Form 0022

02885

TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No.

Page 3 of 4

Subcontract No.

Steve Parker 978-658-7899

Project No.
NUSC Disposal Area
N8856-0530

Laboratory Name:
Alpha Analytical Laboratory

Sampler Signatures
L. Zapolski

Date Shipped
8/14/03

Carrier
courier

Airbill No.
courier - hand delivered

No. of Coolers
3

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type	Container Type	Container Type	Container Type	Container Type
						40 ml voa				
						Analysis	Analysis	Analysis	Analysis	Analysis
						VOCs (high), GRO				
						Preservative	Preservative	Preservative	Preservative	Preservative
						MeOH / ice				
	AQ	8/14/03/1245	DA-S-TP-TB04-01			1				

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
L. Zapolski	8/14/03 1645	[illegible]	YES NO	
Relinquished By: (Signature)	**Date/Time**	**Received for Laboratory By:**	**Date/Time**	

Tt NUS Form 0022

02887

TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No.

Page 4 of 4

Subcontract No.
Steve Parker 978-658-7899

Project No.
NUSC Disposal Area
N8856-0530

Laboratory Name:
Alpha Analytical Labortory

Sampler Signatures
L. Sapolsky

Date Shipped
8/14/03

Carrier
courier

Airbill No.
hand delivered

No. of Coolers
3

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40 ml voa	Container Type: 40 ml voa	Container Type: 1000 ml amber	Container Type: 1000 ml amber	Container Type: 1000ml amber	Container Type: 500ml plastic
						Analysis: VOCs	Analysis: GRO	Analysis: SVOCs	Analysis: Pest/PCBs	Analysis: DRO	Analysis: TAL Metals
						Preservative: HCL/ice	Preservative: HCL/ice	Preservative: ice	Preservative: ice	Preservative: ice	Preservative: HNO3/ice
	AQ	8/13/03 1650	DA-S-DIUF-SB01-01			1	1	1	1	1	1
	↓	8/13/03 1640	DA-S-TP-RB01-01			1	1	1	1	1	1
	↓	8/14/03 1530	DA-S-TP-RB02-01			1	1	1	1	1	1

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
L. Sapolsky	8/14/03 1645	[illegible]	YES NO	RB02 → bowl and syringe RB01 → scoop
Relinquished By: (Signature)	**Date/Time**	**Received for Laboratory By:**	**Date/Time**	

Tt NUS Form 0022

02886

TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No. N/A

Page 1 of 1

Subcontract No. N/A

PoC = Steve Parker 978.658.7899

Project No. ~~11279~~ KJ 8/15/03
8956 - 0530

Laboratory Name: Alpha Analytical Lab.

Hand Delivered:

Sampler Signatures: K Jackut

Date Shipped: 8/15/03

Carrier: Fed Ex

Airbill No.: N/A

No. of Coolers: 1

Sample Number	Matrix	"2003" Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40ml vial	Container Type: 40ml vial	Container Type: 8oz glass	Container Type	Container Type
						Analysis: VOCs, GRO (high)	Analysis: VOCs (low)	Analysis: SVOC Pest/PCB TAL Metals DRO	Analysis	Analysis
						Preservative: MeOH/ice	Preservative: Water/ice	Preservative: ice	Preservative	Preservative
	MeOH	1245/7/24	DA-S-TP-TB05-01		MeOH Trip	1	—	—		
	AQ	1030/7/25	DA-S-TP-TB06-01		Water Trip	—	1	—		
	Soil	1150/8/15	DA-S-TP08-0001-01			1	2	1		
		1130/8-15	DA-S-TP08-0304-01		DS	1	2	1		
		1140/8-15	DA-S-TP-DUP05-01		DS	1	2	1		
		1115/8-15	DA-S-TP08-0708-01 (*)			1	2	1		
		0930/8-15	DA-S-TP13-0001-01			1	2	1		
		0935/8-15	DA-S-TP13-0203-01			1	2	1		
		0900/8-15	DA-S-TP13-0405-01		MS/MSD	3	6	3		
		1415/8-15	DA-S-TP12B-0001-01			1	2	1		
	✓	1445/8-15	DA-S-TP12A-0001-01			1	2	1		

KJ 8/15/03

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
K Jackut	8/15/03 1630	Steve Walsh 8/15/03 1830	YES (NO)	(*) Analyze soil and foreign material in soil jar - possibly tar paper (?)
Relinquished By: (Signature)	Date/Time	Received for Laboratory By:	Date/Time	

Tt NUS Form 0022

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No. N/A

Subcontract No. N/A

Page 1 of 1

Steve Parker 978-658-7899

Project No. NUSC Disposal Area N8856-0540

Laboratory Name: Alpha Analytical Labortory

Sampler Signatures: L. Seyplant

Date Shipped: 8/19/03

Carrier: Lab Courier

Airbill No.: hand delivered

No. of Coolers: 1

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40ml amber voa	Container Type: 40ml amber voa	Container Type: 250ml amber	Container Type	Container Type
						Analysis: VOCs (low)	Analysis: VOCs (high), GRO	Analysis: SVOCs, Pest/PCBs, TAL Metals, DRO	Analysis	Analysis
						Preservative: water/ice	Preservative: MeOH/ice	Preservative: ice	Preservative	Preservative
	SO	8/19/03/1220	DA-S-~~ML307~~ 5B07 -0102-01			2	1	1		
		1340	DA-S-~~ML305~~ 5B06 -0515-01			2	1	1		
		1400	DA-S-~~ML305~~ 5B06 -2535-01			2	1	1		
		1430	DA-S-5B02-0102-01			2	1	1		
		1455	DA-S-5B02-0304-01			2	1	1		
		1505	DA-S-5B02-5565-01			2	1	1		
		1525	DA-S-5B04-0102-01			2	1	1		
		1530	DA-S-5B04-2535-01			2	1	1		
		1600	DA-S-5B04-0910-01		Dup06	2	1	1		
		1615	DA-S-5B-DUP06-01		Dup06	2	1	1		
		8/19/03/1545	DA-S-5B-TB08-01			1	–	–		
		7/24/03/1345	DA-S-5B-TB07-01			–	1	–		

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
Lauren Seyplant	8/19/03 1615	Steve Wall 8/19/03	YES NO	
Relinquished By: (Signature)	**Date/Time**	**Received for Laboratory By:**	**Date/Time**	

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No. N/A

Subcontract No. N/A

Page 1 of 3

Steve Parker 978-658-7899

Project No. NUSC Disposal Area N8856-0540

Laboratory Name: Alpha Analytical Laboratory

Sampler Signatures: L. Seydlitz

Date Shipped: 8/20/03

Carrier: lab courier

~~Airbill No.~~ hand delivered

No. of Coolers: 3

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40 ml amber voa	Container Type: 40 ml amber voa	Container Type: 250 ml amber	Container Type	Container Type
						Analysis: VOCs (low)	Analysis: VOCs (high), GRO	Analysis: SVOCs, Pest/PCBs, TAL Metals, DRO	Analysis	Analysis
						Preservative: water/ice	Preservative: MeOH/ice	Preservative: ice	Preservative	Preservative
	SO	8/19/03 0840	DA-S-SB01-0102-01			2	1	1		
		0915	DA-S-SB01-5575-01		MS/MSD	6	3	3		
		0950	DA-S-SB01-0809-01			2	1	1		
		1040	DA-S-SB03-0102-01			2	1	1		
		1045	DA-S-SB03-0304-01			2	1	1		
		1110	DA-S-SB03-0607-01			2	1	1		
		1500	DA-S-SB05-0102-01			2	1	1		
		1530	DA-S-SB05-0203-01			2	1	1		
		1600	DA-S-SB05-0304-01			2	1	1		
		1645	DA-S-~~MW02~~ SB08 -0102-01			2	1	1		
		1700	DA-S-~~MW02~~ SB08 -0607-01		Dup07	2	1	1		
		1730	DA-S-MW-DUP07-01		Dup07	2	1	1		

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
Lauren Seydlitz	8/20 12:38	John Beanchi	YES NO	
Relinquished By: (Signature)	Date/Time	Received for Laboratory By:	Date/Time	

Tt NUS Form 0022

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No. N/A

Subcontract No. N/A

Page 2 of 3

Steve Parker 978-658-7899

Project No. NUSC Disposal Area N8856-0540

Laboratory Name: Alpha Analytical Laborlory

Sampler Signatures: L. Segelind

Date Shipped: 8/20/03

Carrier: lab courier

Airbill No.: hand delivered

No. of Coolers: 3

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40ml voa vial	Container Type: 40ml voa vial	Container Type: 1000ml amber	Container Type: 1000ml amber	Container Type: 1000ml amber	Container Type: 500ml plastic
						Analysis: VOCs	Analysis: GRO	Analysis: SVOCs	Analysis: Pest/PCBs	Analysis: DRO	Analysis: TAL Metals
						Preservative: HCL/ice	Preservative: HCL/ice	Preservative: ice	Preservative: ice	Preservative: ice	Preservative: HNO_3/ice
	AQ	8/20/03/0950	DA-5-SB-RB03-01			2	2	2	2	2	1

JB 8/20/03 JB 8/20/03 JB 8/20/03 JB 8/20/03

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
Lauren Segelind	8/20 12:30	John Brand	YES NO	* Rinsate (RB03) was off of DPT rod sleeve.
Relinquished By: (Signature)	Date/Time	Received for Laboratory By:	Date/Time	

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No. N/A

Subcontract No. N/A

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Steve Parker 978-658-7899

Project/No. NUSC Disposal Area N8856-0540

Laboratory Name: Alpha Analytical Laboratory

Sampler Signatures: L. Zepeda

Date Shipped: 8/20/03

Carrier: lab courier

Airbill No.: hand delivered

No. of Coolers: 3

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40 ml vial	Container Type: 40 ml vial	Container Type	Container Type	Container Type
						Analysis: VOCs (low)	Analysis: VOCs (high), GRO	Analysis	Analysis	Analysis
						Preservative: water/ice	Preservative: MeOH/ice	Preservative	Preservative	Preservative
	AQ	7/24/03/1245	DA-5-SB-TB09-01			—	1			
	AQ	8/20/03/1045	DA-5-SB-TB10-01			1	—			

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
Lauren Zepeda	8/20 12:30	John Branch	YES NO	
Relinquished By: (Signature)	**Date/Time**	**Received for Laboratory By:**	**Date/Time**	

Tt NUS Form 0022

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No. N/A

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Subcontract No. N/A

Steve Parker 978-658-7899

Project No. NUSC Disposal Area N8856-0540

Laboratory Name: Alpha Analytical Laboratory

Sampler Signatures: L. Segalini

Date Shipped: 8/29/03

~~Airbill No.~~ N/A

Carrier: hand delivered to lab counter

No. of Coolers: 2

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40 ml amber voa	Container Type: 40 ml amber voa	Container Type: 250 ml amber	Container Type	Container Type
						Analysis: VOCs (low)	Analysis: VOCs (high), GRO	Analysis: SVOCs, Pest/PCBs, TAL Metals, DRO	Analysis	Analysis
						Preservative: water/ice	Preservative: MeOH/ice	Preservative: ice	Preservative	Preservative
1	SO	8/28/03/0740	DA-S-MW04B-0810-01			2	1	1		
	SO	8/29/03/0800	DA-S-MW04B-1416-01			2	1	1		
	AQ	8/28/03/0730	DA-S-MW-TB12-01			1	—	—		
	AQ	8/28/03/0730	DA-S-MW-TB11-01			—	1	—		

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
Lauren Segalini	8/29/03 10:00	John Boenda	YES (NO)	
Relinquished By: (Signature)	**Date/Time**	**Received for Laboratory By:**	**Date/Time**	

Tt NUS Form 0022

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No. N/A

Page 2 of 2

Subcontract No. N/A

Steve Parker 978-658-7899

Project No. NUSC Disposal Area N8856-0540

Laboratory Name: Alpha Analytical Labortory

Sampler Signatures: L. Sanpient

Date Shipped: 8/29/03

~~Airbill No.~~ hand delivered

Carrier: lab courier

No. of Coolers: 2

Sample Number	Matrix	Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40 ml voa vial	Container Type: 40ml voa vial	Container Type: 1000 ml amber	Container Type: 1000 ml amber	Container Type: 1000ml amber	Container Type: 500 ml plastic
						Analysis: VOCs	Analysis: GRO	Analysis: SVOCs	Analysis: Pest/PCBs	Analysis: DRO	Analysis: TAL Metals
						Preservative: HCL/ice	Preservative: HCL/ice	Preservative: ice	Preservative: ice	Preservative: ice	Preservative: HNO3/ice
	AQ	8/28/03/0850	DA-S-MW-RB04-01			2	2	2	2	2	1
	AQ	7/22/03/1310	DA-S-MW-TB13-01			1	–	–	–	–	–

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
Lauren Sanpient	8/29/03 12:00	John Branch	YES NO	*RB04 (rinsate) off of split barrel
Relinquished By: (Signature)	Date/Time	Received for Laboratory By:	Date/Time	

Tt NUS Form 0022

02894

TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No. N/A

Page 1 of 1

Subcontract No. N/A

POC: Steve Parker 978-658-7899

Project No. NUSC Disposal Area 88856

Laboratory Name: Alpha Analytical Laboratory

Sampler Signatures: K Jarkut

Date Shipped: 9-4-03

Carrier: Hand delivered to courier

Airbill No. N/A

No. of Coolers: 2

Sample Number	Matrix	"2003" Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40ml via	Container Type: 1L Amber Glass	Container Type: 1L Amber Glass	Container Type: 500ml poly	Container Type: 500ml poly
						Analysis: TCL VOCs	Analysis: TCL SVOCs	Analysis: TCL Pest/PCBs	Analysis: TAL Metals	Analysis: Dissolved Metals
						Preservative: HCL; ice	Preservative: ice	Preservative: ice	Preservative: HNO3/ice	Preservative: None/ice
	AQ	9-3/1000	DA-A-MW-TB14-01		Trip Blank	2	—	—	—	—
*	GW	9-3/1450	DA-A-MW02B-01		MS/MSD	6	6	6	2	3

K Jarkut 9-3-03

K Jarkut 9-3-03

K Jarkut 9-3-03

K Jarkut 9-3-03

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
K Jarkut	9-4-03 9:50AM	J Beauch	YES NO	– Please filter and preserve samples for dissolved metals analysis. TtNUS provided 1 extra bottle because of the need for filtering – Perform MS/MSD at *
Relinquished By: (Signature)	Date/Time	Received for Laboratory By:	Date/Time	

Tt NUS Form 0022

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TETRA TECH NUS, INC.

ANALYTICAL SERVICE
Packing List/Chain-of-Custody

Case No. N/A

Page 1 of 1

Subcontract No. N/A

P.O.C= Steve Parker 978 658 7899

Project No. NUSC Disposal Area 8856

Laboratory Name: Alpha Analytical Laboratory

Sampler Signatures: K Jalkut, DJHL

Date Shipped 9-5-05

Airbill No. N/A

Carrier Hand-delivered to courier

No. of Coolers 4

Sample Number	Matrix	2003 Date/Time	Sample Location	Tag Number(s)	QC	Container Type: 40ml vial	Container Type: 1L amber glass	Container Type: 1L amber glass	Container Type: 500ml poly	Container Type: 500ml poly
						Analysis: VOCs	Analysis: SVOCs	Analysis: Pest/PCBs	Analysis: TAL metals	Analysis: Dissolved* Metals
						Preservative: HCL; ice	Preservative: ice	Preservative: ice	Preservative: HNO3/ice	Preservative: HNO3/ice
	AQ	9-4/1200	DA-A-MW-TB15-01		trip	2	—	—	—	—
	GW	9-4/1400	DA-A-MW04B-01			2	2	2	1	1
	GW	9-4/1445	DA-A-MW01B-01		D8	2	2	2	1	1
	GW	9-4/1500	DA-A-MW-DUP08-01		D8	2	2	2	1	1
	AQ	9-4/1700	DA-A-MW-RB05-01		rinsate	2	2	2	1	—
	AQ	9-4/1730	DA-A-MW-RB06-01		rinsate	—	—	—	—	1
	AQ	9-5/1155	DA-A-MW03B-01			2	2	2	1	1

N/A K Jalkut 9-4-03

N/A K Jalkut 9-4-03

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Shipment for Case Complete?	Remarks
DJHL	9/5/03 16:20	Steve Wakend 9/5/03 16:15	YES (circled) NO	* Samples have been filtered + then were preserved [illegible] recorded as dd-mm-yr.
Relinquished By: (Signature)	Date/Time	Received for Laboratory By:	Date/Time	

Tt NUS Form 0022

02897

TETRA TECH NUS, INC.

GROUNDWATER LEVEL MEASUREMENT SHEET

SITE INFORMATION

Site Name: NUSC Disposal Area
Project Number: 8856 0150
Personnel: Dan Hartigan
Date: 9/05/03

Municipality: Middletown
County: Newport
State: Rhode Island
Street or Map Location: Cunningham Street
(If Off-Site):

WEATHER CONDITIONS AND EQUIPMENT

Temperature Range: 60 - 80 °F
Precipitation: None (lot the day before)
Barometric Pressure:
Tidally-Influenced [ ] Yes [X] No

Equipment No.:
Equipment Number:
Latest Calibration Date: —

Well or Piezometer Number	Date/Time	Elevation of Reference Point (Feet)* Top of Drive Point	Water Level Indicator Reading (Feet)*	Adjusted Depth (Feet)*	Groundwater Elevation (Feet)* (Below ground surface.)
DP-01	09-05-03 08:11	0.92	1.19		- 0.27
DP-02	09-05-03 0818	3.27	3.81		- 0.54
DP-03	09-05-03 0836	~~2.71~~ (2.54)	2.71		- 0.17
DP-04	09-05-03 0900	~~5.32~~ (5.55)	5.32		+ 0.23
DP-05	09-05-03 0910	~~4.41~~ (2.88)	4.41		- 1.53
DP-06	09-05-03 0905	~~5.20~~ (3.5)	5.20		- 1.7
DP-07	09-05-03 0914	~~3.13~~ (3.1)	3.13		- 0.03
DP-08	09-05-03 0845	~~2.59~~ (3.1)	2.59		+ 0.51
DP-09	09-05-03 0832	~~2.92~~ (2.7)	2.92		- 0.22

:NUS Form 0010

measured made to 0.00 feet

TETRA TECH NUS, INC. **GROUNDWATER LEVEL MEASUREMENT SHEET**

SITE INFORMATION

Site Name: NUSC Disposal Area
Project Number: 8856
Personnel: Dan HarTigan
Date: 9/05/03

Municipality: Middletown
County: Newport
State: Rhode Island
Street or Map Location: Cunningham Street
(If Off-Site):

WEATHER CONDITIONS AND EQUIPMENT

Temperature Range: 60-80°F
Precipitation: None (Rain the day before)
Barometric Pressure:
Tidally-Influenced [ ] Yes [X] No

Equipment No.:
Equipment Number:
Latest Calibration Date: —

Well or Piezometer Number	Date/Time	Elevation of Reference Point (Feet)*	Water Level Indicator Reading (Feet)* Top of PVC	Adjusted Depth (Feet)*	Groundwater Elevation (Feet)*
MW-01	09-05-03 0745		11.48		
MW-02	09-05-03 0726		4.30		
MW-03B	09-05-03 0754		20.92		
MW-04B	09-05-03 0748		16.29		

NUS Form 0010

measured made to 0.00 feet

TETRA TECH NUS, INC. **GROUNDWATER LEVEL MEASUREMENT SHEET**

SITE INFORMATION

Site Name: NUSC Disposal Area
Project Number: 8856
Personnel:
Date:

Municipality: Middletown RI
County: Newport
State: Rhode Island
Street or Map Location:
(If Off-Site):

WEATHER CONDITIONS AND EQUIPMENT

Temperature Range: 40°-55° F
Precipitation: Scattered
Barometric Pressure:
Tidally-Influenced [ ] Yes [X] No

Equipment No.: Heron Dipper T
Equipment Number: 2242
Latest Calibration Date: —

Well or Piezometer Number	Date/Time	Elevation of Reference Point (Feet)*	Water Level Indicator Reading (Feet)* Inside	Outside	Adjusted Depth (Feet)*	Groundwater Elevation (Feet)* Inside	Outside	Height of MP above G.S.
MW-01B	12/17/03 13:16	52.53 (TOR)	11.08	NA		41.45	NA	NA
MW-02B	12/17/03 1348	51.26 (TOR)	4.05	NA		47.21	NA	NA
MW-03B	12/17/03 1320	47.19 (TOR)	21.66	NA		25.53	NA	NA
MW-04B	12/17/03 1312	48.78 (TOR)	15.89	NA		32.89	NA	NA
DP-02	12/17/03 1405	29.0 (GS)	3.61	2.73	Stream Receiving			2.73
DP-03	12/17/03 1410	28.5 (GS)	2.70	NA	+2.58	28.38	NA	2.58
DP-04	12/17/03 1339	38.0 (GS)	5.32	NA	+5.30	37.98	NA	5.30
DP-05	12/17/03 1334	35.0 (GS)	2.89	2.88	Stream Receiving/NIL			2.88
DP-06	12/17/03 1330	27.0 (GS)	4.15	NA	+3.49	26.34	NA	3.49
DP-07	12/17/03 1322	24.9 (GS)	3.85	NA	+3.09	24.14	NA	3.09
DP-08	12/17/03 1418	26.9 (GS)	2.70	2.70	NIL			2.70
DP-09	12/17/03 1414	28.2 (GS)	2.85	2.52	Stream Receiving			2.52

NUS Form 0010

measured made to 0.00 feet

Naval Underwater Warfare Center
Slug Tests at NUSC Disposal Area

Slug tests of four monitoring wells at Newport NUSC.

September 5th, 2003, conducted by Daniel Hartigan

MW-01

Set miniTROLL (datalogger) at 18 feet below the top of the PVC.
Depth to water using a water level probe = 11.49 feet
Total depth of well from top of PVC = 42.0 feet

Insert miniTROLL at 10:45 for slug tests:

10 minute linear slug test with 1liter of DI water poured through a funnel at top of well
Set data logger to take a reading every 0.5 seconds

(MW_01_slug_lin.xls)
Start: 1055
Stop: 1106

5 minute logarithmic test with 1liter of DI water poured through funnel at top of well
Set data logger to take reading on a log scale with 30 seconds being the maximum interval between readings.

(MW_01_slug_log.xls) backup file (9.tmp)
Start: 1122
Stop: 1128

MW-04B

Set miniTROLL (datalogger) at approximately 30 feet below the top of the PVC.
Initial miniTROLL reading is 9.239 feet below top of water column.
Depth to water using a water level probe = 16.31 feet
Total depth of well from top of PVC = 45.65 feet

Insert miniTROLL at 11:50 for slug tests:

10 minute linear slug test with 1liter of DI water poured through a funnel at top of well
Set data logger to take a reading every 0.5 seconds

(MW_04B_slug_lin.xls) backup file (3.tmp)
Start: 1200
Stop: 1211

5 minute logarithmic test with 1liter of DI water poured through funnel at top of well
Set data logger to take reading on a log scale with 30 seconds being the maximum interval between readings.

(MW_04B_slug_log.xls) backup file (6.tmp)
Start: 1217
Stop: 1223

MW-02

Set miniTROLL (datalogger) at approximately 26 feet below the top of the PVC.
Initial miniTROLL reading is 20.774 feet below top of water column.
Depth to water using a water level probe = 4.34 feet
Total depth of well from top of PVC = 43.8 feet

Insert miniTROLL at 13:05 for slug tests:

<u>10 minute linear slug test with 1liter of DI water poured through a funnel at top of well</u>
Set data logger to take a reading every 0.5 seconds

(MW_02_slug_lin.xls) backup file (5.tmp)
Start: 1310
Stop: 1321

<u>5 minute logarithmic test with 1liter of DI water poured through funnel at top of well</u>
Set data logger to take reading on a log scale with 30 seconds being the maximum interval between readings.

(MW_02_slug_log.xls)
Start: 1324
Stop: 1330

- Lost about 50ml of Diwater from overflow while purring in 1L throught the funnel, due to the height of the water column in the well.

MW-03B

Set miniTROLL (datalogger) at approximately 23 feet below the top of the PVC.
Initial miniTROLL reading is 2.380 feet below top of water column.
Depth to water using a water level probe = 20.98 feet
Total depth of well from top of PVC = 26.52 feet

Insert miniTROLL at approximately 1408 for slug tests:

<u>10 minute linear slug test with 1liter of DI water poured through a funnel at top of well</u>
Set data logger to take a reading every 0.5 seconds

(MW_03B_slug_lin.xls) backup file (5.tmp)
Start: 1414
Stop: 1425

<u>5 minute logarithmic test with 1liter of DI water poured through funnel at top of well</u>
Set data logger to take reading on a log scale with 30 seconds being the maximum interval between readings.

(MW_03B_slug_log.xls)
Start: 1433
Stop: 1439

- Lost about 50ml of Diwater from overflow while purring in 1L throught the funnel, due to the height of the water column in the well.

Finished slug tests September 5th, 2003 at 14:46

TABLE 1 - WELL DATA SUMMARY

CLIENT:	Navy			JOB NUMBER:	N8856
SUBJECT:	CTO 849 - NUSC				
BY:	CDR	**CHECKED BY:**	cdr	DATE:	1/19/2004

Well ID	Well Casing Inside Dia. (in)	Borehole Dia. (in)	MP	Stickup (1) (ft)	Depth to Groundwater (2) (ft-BMP)	Depth to Groundwater (2) (ft-BGS)	Depth to confining layer (3) (ft-BGS)	Depth to top of well screen (1) (ft-BGS)	Depth to bottom of well screen (1) (ft-BGS)	Materials Opposite Well Screen	Estimated Hydraulic Conductivity (feet/day) (4,5)
MW01B	1	3	TPVC	3.00	11.49	8.49	10.00	10.00	39.00	shale/phyllite	2.0
MW02B	1	3	TPVC	-0.50	4.34	4.84	6.00	6.80	44.80	shale/phyllite	1.0
MW03B	1	3	TPVC	2.52	20.98	18.46	4.00	4.00	24.00	shale/phyllite	IR
MW04B	1	3	TPVC	0.65	16.31	15.66	15.00	15.00	45.00	shale/phyllite	5.0

References:

1) Data from well construction log.

2) Measured on September 5, 2003.

3) Data from geologic log.

4) Cooper, Bredehoeft, and Papadopulos (1967) method.

5) Slug addition by pouring was not approximately instantaneous, which is an assumption that must be met inorder to calculate hydraulic conductivity using this method.

MP = measuring point.

TOWC = Top of well casing.

BMP = below measuring point.

BGS = below ground surface.

IR = Insufficient Response.

APPENDIX D

SOIL GAS SURVEY REPORT – W. L. GORE AND ASSOCIATES

W. L. GORE & ASSOCIATES, INC.
100 CHESAPEAKE BLVD., P.O. BOX 10 • ELKTON, MARYLAND 21922-0010 • PHONE: 410/392-7600
FAX: 410/506-4780

Creative Technologies Worldwide

GORE-SORBER® EXPLORATION SURVEY
GORE-SORBER® SCREENING SURVEY

GORE™ Survey for Site Assessment Final Report

NUSC Disposal Area
Newport, RI

August 1, 2003

Prepared For:
Tetra Tech Nus, Inc.
55 Jonspin Road
Wilmington, MA 01887-1020

W.L. Gore & Associates, Inc.

Written/Submitted by:
Jay W. Hodny, Ph.D., Project Specialist

Reviewed/Approved by:
Ray Fenstermacher, P.G., Project Manager

Analytical Data Reviewed by:
Jim E. Whetzel, Chemist

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GORE™ Surveys for Site Assessment
Final Report

REPORT DATE: August 1, 2003 **AUTHOR:** JWH

SITE INFORMATION

Site Reference: NUSC Disposal Area, Newport, RI
Customer Purchase Order Number: GCMP-03-046-0888
Gore Production Order Number: 11473462 **Gore Site Code:** CKS

FIELD PROCEDURES

 # Modules shipped: 42
Installation Date(s): 7/1,2/2003 **# Modules Installed:** 37
Field work performed by: Tetra Tech Nus, Inc.

Retrieval date(s): 7/17/2003 **Exposure Time:** ~16 [days]
 # Modules Retrieved: 37 **# Trip Blanks Returned:** 4
 # Modules Lost in Field: 0 **# Unused Modules Returned:** 1

Date/Time Received by Gore: 7/21/2003 @ 8:05 AM **By:** CW
Chain of Custody Form attached: √
Chain of Custody discrepancies: None
Comments:
Modules #427782, -783, -784, and -785 were identified as trip blanks.
Module #427786 was returned and appeared unused.
The original Installation and Retrieval Log was not returned. However, Tetra Tech NUS supplied an Installation Log.

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GORE™ Surveys for Site Assessment
Final Report

ANALYTICAL PROCEDURES

W.L. Gore & Associates´ Screening Module Laboratory operates under the guidelines of its Quality Assurance Manual, Operating Procedures and Methods. The quality assurance program is consistent with Good Laboratory Practices (GLP) and ISO Guide 25, "General Requirements for the Competence of Calibration and Testing Laboratories", third edition, 1990.

Instrumentation consists of state of the art gas chromatographs equipped with mass selective detectors, coupled with automated thermal desorption units. Sample preparation simply involves cutting the tip off the bottom of the sample module and transferring one or more exposed sorbent containers (sorbers, each containing 40mg of a suitable granular adsorbent) to a thermal desorption tube for analysis. Sorbers remain clean and protected from dirt, soil, and ground water by the insertion/retrieval cord, and require no further sample preparation.

Analytical Method Quality Assurance:
The analytical method employed is a modified EPA method 8260/8270. Before each run sequence, two instrument blanks, a sorber containing 5μg BFB (Bromofluorobenzene), and a method blank are analyzed. The BFB mass spectra must meet the criteria set forth in the method before samples can be analyzed. A method blank and a sorber containing BFB is also analyzed after every 30 samples and/or trip blanks. Standards containing the selected target compounds at three calibration levels of 5, 20, and 50μg are analyzed at the beginning of each run. The criterion for each target compound is less than 35% RSD (relative standard deviation). If this criterion is not met for any target compound, the analyst has the option of generating second- or third-order standard curves, as appropriate. A second-source reference standard, at a level of 10μg per target compound, is analyzed after every ten samples and/or trip blanks, and at the end of the run sequence. Positive identification of target compounds is determined by 1) the presence of the target ion and at least two secondary ions; 2) retention time versus reference standard; and, 3) the analyst's judgment.

NOTE: All data have been archived. Any replicate sorbers not used in the initial analysis will be discarded fifteen (15) days from the date of analysis.

Laboratory analysis: thermal desorption, gas chromatography, mass selective detection
Instrument ID: # 3 **Chemist:** JW
Compounds/mixtures requested: Gore Expanded Target Compounds
Deviations from Standard Method: None
Comments: Soil vapor analytes and abbreviations are tabulated in the Data Table Key (page 6). Fluorene responses used to calculate the masses of phenanthrene, anthracene, fluoranthene, and pyrene desorbed from the modules.
The top 10 tentatively identified compounds from each sample were reported if present. Chromatographic areas had to be at least 10% of the lowest response in the 5 µg calibration standard.

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DATA TABULATION

 # CONTOUR MAPS ENCLOSED: Three (3) B-sized color contour maps
LIST OF MAPS ENCLOSED:

- Benzene, Toluene, Ethyl benzene, and total Xylenes (BTEX)
- Undecane, Tridecane, and Pentadecane (C11, C13&C15)
- Trichloroethene (TCE)

NOTE: All data values presented in Appendix A represent masses of compound(s) desorbed from the GORE™ Modules received and analyzed by W.L. Gore & Associates, Inc., as identified in the Chain of Custody (Appendix A). The measurement traceability and instrument performance are reproducible and accurate for the measurement process documented. Semi-quantitation of the compound mass is based on either a single-level (QA Level 1) or three-level (QA Level 2) standard calibration.

General Comments:

- This survey reports soil gas mass levels present in the vapor phase. Vapors are subject to a variety of attenuation factors during migration away from the source concentration to the module. Thus, mass levels reported from the module will often be less than concentrations reported in soil and groundwater matrix data. In most instances, the soil gas masses reported on the modules compare favorably with concentrations reported in the soil or groundwater (e.g., where soil gas levels are reported at greater levels relative to other sampled locations on the site, matrix data should reveal the same pattern, and vice versa). However, due to a variety of factors, a perfect comparison between matrix data and soil gas levels can rarely be achieved.
- Soil gas signals reported by this method cannot be identified specifically to soil adsorbed, groundwater, and/or free-product contamination. The soil gas signal reported from each module can evolve from all of these sources. Differentiation between soil and groundwater contamination can only be achieved with prior knowledge of the site history (i.e., the site is known to have groundwater contamination only).
- QA/QC trip blank modules were provided to document potential exposures that were not part of the soil gas signal of interest (i.e., impact during module shipment, installation and retrieval, and storage). The trip blanks are identically manufactured and packaged soil gas modules to those modules placed in the subsurface. However, the trip blanks remain unopened during all phases of the soil gas survey. Levels reported on the trip blanks may indicate potential impact to modules other than the contaminant source of interest.

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- Unresolved peak envelopes (UPEs) are represented as a series of compound peaks clustered together around a central gas chromatograph elution time in the total ion chromatogram. Typically, UPEs are indicative of complex fluid mixtures that are present in the subsurface. UPEs observed early in the chromatogram are considered to indicate the presence of more volatile fluids, while UPEs observed later in the chromatogram may indicate the presence of less volatile fluids. Multiple UPEs may indicate the presence of multiple complex fluids.
- Stacked total ion chromatograms (TICs) are included in Appendix A. The six-digit serial number of each module is incorporated into the TIC identification (e.g.: 123456S.D represents module #123456).

Project Specific Comments:

- The minimum (gray) contour level, for each mapped analyte or group of analytes, was set at the maximum blank level observed or the method detection limit, whichever was greater. When target compounds are summed together (i.e., BTEX), the contour minimum is arbitrarily set at 0.02 μg or the maximum blank level, whichever is greater. The maximum contour level was set at the maximum value observed.
- No target compounds were detected on the trip blanks and/or the method blanks. Thus, target analyte levels reported for the field-installed modules that exceed trip and method blank levels, and the analyte method detection limit, are more likely to have originated from on-site sources.
- The soil gas mass levels were low but present in mappable levels. Isolated "hot spots" were observed along with fairly well defined soil gas plumes.
- If the objective of the soil gas survey was to delineate the nature and extent of the contamination, then additional soil gas sampling is recommended in those areas where the color contours appear to extend into unsampled areas. Subsequent sampling events can be combined with the data from this event and mapped together to provide greater coverage.

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GORE™ Surveys for Site Assessment
Final Report

KEY TO DATA TABLE
NUSC Disposal Area, Newport, RI

UNITS

µg	micrograms (per sorber), reported for compounds
MDL	method detection limit
bdl	below detection limit
nd	non-detect

ANALYTES

BTEX	combined masses of benzene, toluene, ethylbenzene and total xylenes (Gasoline Range Aromatics)
BENZ	benzene
TOL	toluene
EtBENZ	ethylbenzene
mpXYL	m-, p-xylene
oXYL	o-xylene
C11,C13&C15	combined masses of undecane, tridecane, and pentadecane (C11+C13+C15) (Diesel Range Alkanes)
UNDEC	undecane
TRIDEC	tridecane
PENTADEC	pentadecane
TMBs	combined masses of 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene
135TMB	1,3,5-trimethylbenzene
124TMB	1,2,4-trimethylbenzene
ct12DCE	cis- & trans-1,2-dichloroethene
t12DCE	trans-1,2-dichloroethene
c12DCE	cis-1,2-dichloroethene
NAPH&2-MN	combined masses of naphthalene and 2-methyl naphthalene
Combined PAHs	combined masses of naphthalene, 2-methyl naphthalene, acenaphthene, acenaphthylene, fluorene, phenanthrene, anthracene, fluoranthene, and pyrene.
NAPH	naphthalene
2MeNAPH	2-methyl naphthalene
MTBE	methyl t-butyl ether
PHEN	phenanthrene
11DCA	1,1-dichloroethane
$CHCl_3$	chloroform
111TCA	1,1,1-trichloroethane
12DCA	1,2-dichloroethane
CCl_4	carbon tetrachloride
TCE	trichloroethene
OCT	octane
PCE	tetrachloroethene
ClBENZ	chlorobenzene
14DCB	1,4-dichlorobenzene

BLANKS

TBn	unexposed trip blanks, travels with the exposed modules
method blank	QA/QC module, documents analytical conditions during analysis

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APPENDIX A:

1. CHAIN OF CUSTODY
2. DATA TABLE
3. STACKED TOTAL ION CHROMATOGRAMS
4. COLOR CONTOUR MAPS
5. LABORATORY DATA DELIVERABLES

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GORE-SORBER® Screening Survey Chain of Custody

For W.L. Gore & Associates use only
Production Order # 11473462

GORE Creative Technologies Worldwide

W. L. Gore & Associates, Inc., Survey Products Group

100 Chesapeake Boulevard • Elkton, Maryland 21921 • Tel: (410) 392-7600 • Fax (410) 506-4780

Instructions: Customer must complete ALL shaded cells

Customer Name: tetra tech NUS	Site Name: NDSC Disposal Area
Address: Accounts Payable, Foster Plaza 1/11, 661 Anderson Drive, Pittsburg PA 15220	Site Address: (SA-08) t/o Proj N3856
	Project Manager: Steve Parker
Phone: (978) 658-7899	Customer Project No.:
FAX: 978-658-7870	Customer P.O. # BCMP-03-046-0885 Quote #: 216796

Serial # of Modules Shipped											
# 423390	-	# 423396	#	-	#	# of Modules for Installation	0	# of Trip Blanks	4		
# 427752	-	# 427786	#	-	#	Total Modules Shipped:	42	Pieces			
#	-	#	#	-	#	Total Modules Received:	42	Pieces			
#	-	#	#	-	#	Total Modules Installed:	32	Pieces			
#	-	#	#	-	#	Serial # of Trip Blanks (*Client Decides*)			#		
#	-	#	#	-	#	# 427782		#		#	
	-	#	#	-	#	# 427783		#		#	
#	-	#	#	-	#	# 427784		#		#	
#	-	#	#	-	#	# 427785		#		#	
#	-	#	#	-	#	#		#		#	
#	-	#	#	-	#	#		#		#	
						#		#		#	
						#		#		#	

Prepared By: Marlene Gulowicz
Verified By: Marylou Meagher

Installation Performed By:	Installation Method(s) (*circle those that apply*):
Name (*please print*): Lauren Seydewitz	Slide Hammer (Hammer Drill) Auger
Company/Affiliation: Tetra Tech NUS, Inc. / Env. Scientist	Other:
Installation Start Date and Time: 7 / 1 / 2003 9:50 (AM) PM	
Installation Complete Date and Time: 7 / 2 / 2003 14:45 AM (PM)	
Retrieval Performed By:	Total Modules Retrieved: 42 Pieces
Name (*please print*): Lauren Seydewitz	Total Modules Lost in Field: 0 Pieces
Company/Affiliation: 1 TtNUS / Env. Scientiest	Total Unused Modules Returned: 0 (rest are Field Blanks - 1 was used as demo) Pieces
Retrieval Start Date and Time: 7 / 17 / 2003 10:00 (AM) PM	
Retrieval Complete Date and Time: 7 / 17 / 2003 13:17 AM (PM)	

Relinquished By	Date	Time	Received By	Date	Time
Marlene Gulowicz Affiliation: W.L. Gore & Associates, Inc.	6-17-03	2:00	Affiliation:		
Relinquished By Affiliation:	Date	Time	Received By: Affiliation:	Date	Time
Relinquished By Affiliation	Date	Time	Received By: Alan Wh[illegible] Affiliation: W.L. Gore & Associates, Inc.	Date 7-21-03	Time 8:05

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TA. 1-1
GORE-SORBER SOIL GAS COLLECTORS
NUSC DISPOSAL AREA
STUDY AREA SCREENING EVALUATION
NUWC, NEWPORT, RHODE ISLAND

		INSTALLED		REMOVED					
SAMPLE ID	SERIAL NUMBER	DATE	TIME	DATE	TIME	FID	PID	DEPTH BGS (FEET)	SURFACE TYPE
DA-SG-G200	423390	7/1/2003	950	7/17/2003	1030	125.0	0.0	2.5	asphalt
DA-SG-G250	423391	7/1/2003	1005	7/17/2003	1035	990.0	1025.0	1.5	asphalt
DA-SG-G300	423392	7/1/2003	1015	7/17/2003	1040	2500.0	0.0	3.0	asphalt
DA-SG-DUP01	423393	7/1/2003	1020	7/17/2003	1045	2000.0	0.0	3.0	asphalt
DA-SG-F400	423394	7/1/2003	1030	7/17/2003	1055	32.0	0.0	2.5	asphalt
DA-SG-F300	423395	7/1/2003	1050	7/17/2003	1100	250.0	0.0	3.0	asphalt
DA-SG-F250	423396	7/1/2003	1100	7/17/2003	1105	1300.0	0.0	2.0	asphalt
DA-SG-FG200	427752	7/1/2003	1110	7/17/2003	1110	152.0	0.0	2.0	asphalt
DA-SG-FG250	427753	7/1/2003	1120	7/17/2003	1115	1500.0	no reading	3.0	asphalt
DA-SG-GH300	427754	7/1/2003	1135	7/17/2003	1050	175.0	15.9	2.5	asphalt
DA-SG-G400	427755	7/1/2003	1235	7/17/2003	1118	303.0	0.0	2.5	asphalt
DA-SG-H400	427756	7/1/2003	1250	7/17/2003	1135	4.2	9.3	3.0	asphalt
DA-SG-G100	427757	7/1/2003	1325	7/17/2003	1315	28.0	0.0	3.0	asphalt
DA-SG-DUP02	427758	7/1/2003	1330	7/17/2003	1317	173.0	0.0	3.0	asphalt
DA-SG-F500	427759	7/1/2003	1345	7/17/2003	1250	0.0	34.6	3.0	grass
DA-SG-EF550	427760	7/1/2003	1400	7/17/2003	1300	no reading	0.0	2.5	grass
DA-SG-E500	427761	7/1/2003	1430	7/17/2003	1245	no reading	0.0	3.0	grass
DA-SG-DE400	427762	7/1/2003	1520	7/17/2003	1305	no reading	0.0	3.0	grass
DA-SG-E400	427763	7/1/2003	1540	7/17/2003	1235	no reading	0.0	3.0	grass
DA-SG-CD550	427764	7/2/2003	1000	7/17/2003	1150	0.0	0.0	3.0	grass
DA-SG-D600	427765	7/2/2003	1020	7/17/2003	1155	0.0	0.0	3.0	grass
DA-SG-D550	427766	7/2/2003	1030	7/17/2003	1210	0.0	0.0	2.5	grass (hole is full of water)
DA-SG-CD600	427767	7/2/2003	1035	7/17/2003	1145	0.0	0.0	2.5	grass
DA-SG-DUP03	427768	7/2/2003	1040	7/17/2003	1147	0.0	0.0	2.5	grass
DA-SG-D650	427769	7/2/2003	1055	7/17/2003	1200	0.0	0.0	3.0	grass
DA-SG-C700	427770	7/2/2003	1105	7/17/2003	1015	0.0	0.0	3.0	grass
DA-SG-C600	427771	7/2/2003	1115	7/17/2003	1005	0.0	0.0	3.0	grass
DA-SG-B700	427772	7/2/2003	1130	7/17/2003	1140	0.0	13.9	3.0	grass
DA-SG-A700	427773	7/2/2003	1145	7/17/2003	1000	0.0	0.0	3.0	grass
DA-SG-B600	427774	7/2/2003	1155	7/17/2003	1020	0.0	0.0	3.0	grass
DA-SG-D450	427775	7/2/2003	1250	7/17/2003	1225	0.0	0.0	3.0	grass
DA-SG-DUP04	427776	7/2/2003	1255	7/17/2003	1227	0.0	0.0	3.0	grass
DA-SG-D500	427777	7/2/2003	1310	7/17/2003	1230	0.0	0.0	3.0	grass
DA-SG-C450	427778	7/2/2003	1325	7/17/2003	1215	0.0	0.9	3.0	grass
DA-SG-E325	427779	7/2/2003	1345	7/17/2003	1237	1.5	1330.0	3.0	grass
DA-SG-GH350	427780	7/2/2003	1430	7/17/2003	1120	15.0	950.0	3.0	grass
DA-SG-HI400	427781	7/2/2003	1445	7/17/2003	1130	0.0	7.1	3.0	sediment (hole is full of water)

*note: There was a rain event the day before the collectors were retrieved.

GORE SORBER SCREENING ... EY ANALYTICAL RESULTS
TETRA TECH NUS, PITTSBURGH, PA
GORE EXPANDED TARGET VOCs/SVOCs (A4)
NUSC DISPOSAL AREA, NUWC, NEWPORT, RHODE ISLAND
SITE CKS - PRODUCTION ORDER #11473462

DATE ANALYZED	SAMPLE NAME	BTEX, ug	BENZ, ug	TOL, ug	EtBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug	c12DCE, ug
	MDL=		0.05	0.03	0.02	0.03	0.03		0.03	0.02	0.02		0.01	0.01		0.05	0.05
07/23/03	423390	0.25	0.20	0.05	nd	nd	nd	0.23	0.09	0.09	0.05	0.01	0.01	nd	0.11	nd	0.11
07/23/03	423391	0.08	nd	0.05	nd	0.03	nd	0.25	0.12	0.07	0.06	0.04	0.02	0.02	0.00	nd	bdl
07/23/03	423392	nd	nd	nd	nd	nd	nd	0.73	0.34	0.27	0.12	0.03	0.02	0.02	nd	nd	nd
07/23/03	423393	0.24	0.16	0.05	nd	0.03	nd	0.55	0.23	0.20	0.12	0.01	bdl	0.01	nd	nd	nd
07/23/03	423394	0.14	0.05	0.09	nd	bdl	nd	0.20	0.15	0.03	0.02	0.04	0.03	0.02	nd	nd	nd
07/23/03	423395	0.22	0.06	0.15	nd	bdl	nd	3.15	1.00	1.35	0.80	0.08	0.06	0.03	nd	nd	nd
07/23/03	423396	0.23	0.08	0.10	bdl	0.05	bdl	0.19	0.08	0.06	0.04	0.01	bdl	0.01	nd	nd	nd
07/23/03	427752	0.25	nd	0.25	nd	nd	nd	0.19	0.03	0.09	0.07	nd	nd	nd	nd	nd	nd
07/23/03	427753	nd	nd	nd	nd	nd	nd	0.19	0.14	0.05	bdl	0.05	0.02	0.03	nd	nd	nd
07/23/03	427754	0.42	0.15	0.05	0.04	0.13	0.05	0.73	0.32	0.24	0.17	0.10	0.07	0.03	nd	nd	nd
07/23/03	427755	0.13	0.05	0.04	nd	0.04	nd	0.39	0.04	0.13	0.22	0.03	0.02	0.01	0.00	nd	bdl
07/24/03	427756	0.39	0.06	0.13	0.04	0.11	0.05	0.05	0.05	nd	nd	0.06	0.02	0.04	0.41	0.06	0.35
07/24/03	427757	0.08	bdl	nd	bdl	0.08	nd	2.32	2.23	0.10	bdl	0.55	0.39	0.16	nd	nd	nd
07/24/03	427758	0.05	nd	0.05	nd	nd	nd	1.71	1.41	0.22	0.08	0.38	0.32	0.06	nd	nd	nd
07/24/03	427759	0.11	bdl	nd	nd	nd	0.11	0.24	0.15	0.07	0.02	0.04	0.02	0.02	nd	nd	nd
07/24/03	427760	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427761	nd	nd	nd	nd	nd	nd	0.04	0.04	nd	nd	nd	nd	nd	0.11	nd	0.11
07/24/03	427762	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427763	0.20	nd	0.08	0.03	0.08	bdl	0.07	0.07	nd	nd	0.04	0.02	0.02	nd	nd	nd
07/24/03	427764	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427765	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427766	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427767	nd	nd	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd	nd	nd
07/24/03	427768	nd	nd	nd	nd	nd	nd	0.17	0.17	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427769	0.00	bdl	nd	nd	bdl	nd	0.00	bdl	bdl	bdl	0.02	0.02	nd	nd	nd	nd
07/24/03	427770	0.17	nd	0.17	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427771	nd	nd	nd	nd	nd	nd	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427772	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427773	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427774	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427775	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427776	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427777	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427778	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427779	0.05	bdl	0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427780	0.63	bdl	0.08	0.09	0.33	0.13	0.13	0.06	0.02	0.05	0.03	0.02	0.01	nd	nd	nd
07/24/03	427781	nd	nd	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd	nd	nd
07/23/03	427782	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427783	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427784	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	427785	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/23/03	method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/24/03	method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	Maximum	0.63	0.20	0.25	0.09	0.33	0.13	3.15	2.23	1.35	0.80	0.55	0.39	0.16	0.41	0.06	0.35
	Standard Dev.	0.15	0.05	0.06	0.02	0.06	0.03	0.68	0.44	0.23	0.14	0.11	0.08	0.03	0.07	0.01	0.06
	Mean	0.10	0.03	0.04	0.01	0.03	0.01	0.31	0.18	0.08	0.05	0.04	0.03	0.01	0.02	0.00	0.02

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE SORBER SCREENING EY ANALYTICAL RESULTS
TETRA TECH NUS, PITTSBURGH, PA
GORE EXPANDED TARGET VOCs/SVOCs (A4)
NUSC DISPOSAL AREA, NUWC, NEWPORT, RHODE ISLAND
SITE CKS - PRODUCTION ORDER #11473462

SAMPLE NAME	Combined PAHs, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	PHEN, ug
MDL=			0.01	0.01	0.04	0.05	0.03	0.04	0.03	0.04	0.03	0.02	0.01	0.02	0.02	0.02
423390	0.06	0.03	nd	0.03	bdl	nd	nd	nd	0.07	0.07	nd	nd	0.01	nd	0.02	nd
423391	0.03	0.02	nd	0.02	bdl	nd	nd	nd	nd	nd	0.04	nd	0.02	nd	bdl	nd
423392	0.26	0.17	0.05	0.12	bdl	nd	0.03	nd	nd	0.08	0.40	nd	0.02	bdl	bdl	0.04
423393	0.11	0.03	nd	0.03	bdl	nd	0.06	nd	0.13	0.12	1.17	nd	0.05	nd	bdl	0.04
423394	0.28	0.09	0.07	0.02	nd	nd	nd	nd	0.17	nd	nd	nd	0.07	nd	0.03	0.08
423395	0.57	0.31	0.10	0.22	nd	nd	nd	nd	nd	nd	nd	nd	0.08	bdl	0.04	0.14
423396	0.09	0.06	0.04	0.02	bdl	nd	nd	nd	nd	0.14	nd	nd	0.04	nd	bdl	nd
427752	0.03	0.03	nd	0.03	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427753	0.05	0.02	0.02	bdl	nd	nd	nd	nd	nd	0.06	nd	nd	0.04	nd	bdl	nd
427754	0.23	0.08	0.04	0.04	nd	nd	0.13	nd	0.33	0.15	0.19	nd	0.06	bdl	0.02	0.07
427755	0.45	0.25	0.15	0.10	bdl	nd	nd	nd	0.09	nd	nd	nd	0.09	bdl	0.03	0.08
427756	0.02	0.02	0.02	nd	bdl	nd	nd	nd	0.67	nd	0.07	nd	nd	nd	nd	nd
427757	0.06	0.06	0.04	0.03	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427758	0.35	0.23	0.11	0.12	nd	nd	nd	nd	nd	nd	0.03	nd	0.06	nd	bdl	0.06
427759	1.51	0.28	0.23	0.04	nd	nd	nd	nd	0.65	nd	0.36	nd	0.49	0.02	0.17	0.45
427760	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427761	nd	nd	nd	nd	nd	nd	nd	nd	2.44	nd	0.18	nd	nd	nd	nd	nd
427762	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.16	nd	nd	nd	nd	nd
427763	0.01	nd	nd	nd	bdl	nd	nd	nd	9.20	nd	0.24	nd	0.01	nd	nd	nd
427764	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427765	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427766	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427767	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427768	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427769	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427770	nd	nd	nd	nd	nd	nd	nd	nd	10.66	nd	0.38	nd	nd	nd	nd	nd
427771	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427772	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427773	nd	nd	nd	nd	nd	nd	nd	nd	0.04	nd	nd	nd	nd	nd	nd	nd
427774	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427775	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427776	0.18	0.02	0.02	nd	nd	nd	nd	nd	nd	nd	bdl	nd	0.03	nd	bdl	0.13
427777	0.03	0.03	0.03	bdl	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd
427778	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427779	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427780	0.75	0.05	0.02	0.02	bdl	nd	nd	nd	nd	nd	nd	nd	0.14	nd	0.08	0.32
427781	nd	nd	nd	nd	nd	0.33	0.31	nd	nd	nd	nd	nd	nd	nd	nd	nd
427782	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427783	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427784	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
427785	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Maximum	1.51	0.31	0.23	0.22	0.03	0.33	0.31	0.00	10.66	0.15	1.17	0.00	0.49	0.02	0.17	0.45
Standard Dev.	0.29	0.09	0.05	0.05	0.01	0.05	0.06	0.00	2.29	0.04	0.22	0.00	0.08	0.00	0.03	0.09
Mean	0.14	0.05	0.03	0.02	0.00	0.01	0.01	0.00	0.66	0.02	0.09	0.00	0.03	0.00	0.01	0.04

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE SORBER SCREENING EY ANALYTICAL RESULTS
TETRA TECH NUS, PITTSBURGH, PA
GORE EXPANDED TARGET VOCs/SVOCs (A4)
NUSC DISPOSAL AREA, NUWC, NEWPORT, RHODE ISLAND
SITE CKS - PRODUCTION ORDER #11473462

SAMPLE NAME	Anthracene, ug	Fluoranthene, ug	Pyrene, ug	CHCl3, ug	CCl4, ug	ClBENZ, ug
MDL=	0.02	0.02	0.02	0.02	0.03	0.02
423390	nd	nd	nd	nd	nd	nd
423391	nd	nd	nd	nd	nd	nd
423392	bdl	nd	0.03	nd	nd	nd
423393	bdl	nd	nd	nd	nd	nd
423394	nd	nd	nd	nd	nd	nd
423395	bdl	nd	nd	nd	nd	nd
423396	nd	nd	nd	nd	nd	nd
427752	nd	nd	nd	0.06	nd	nd
427753	nd	nd	nd	nd	nd	nd
427754	bdl	nd	nd	0.09	nd	nd
427755	nd	nd	nd	nd	nd	nd
427756	nd	nd	nd	bdl	nd	nd
427757	nd	nd	nd	nd	nd	nd
427758	nd	nd	nd	0.09	nd	nd
427759	0.03	0.05	0.03	0.03	nd	nd
427760	nd	nd	nd	nd	nd	nd
427761	nd	nd	nd	nd	nd	nd
427762	nd	nd	nd	nd	nd	nd
427763	nd	nd	nd	0.04	0.05	nd
427764	nd	nd	nd	nd	nd	nd
427765	nd	nd	nd	nd	nd	nd
427766	nd	nd	nd	nd	nd	nd
427767	nd	nd	nd	nd	nd	nd
427768	nd	nd	nd	nd	nd	nd
427769	nd	nd	nd	nd	nd	nd
427770	nd	nd	nd	nd	nd	nd
427771	nd	nd	nd	bdl	nd	nd
427772	nd	nd	nd	nd	nd	nd
427773	nd	nd	nd	nd	nd	nd
427774	nd	nd	nd	nd	nd	nd
427775	nd	nd	nd	nd	nd	nd
427776	nd	nd	nd	nd	nd	nd
427777	nd	nd	nd	nd	nd	nd
427778	nd	nd	nd	nd	nd	nd
427779	nd	nd	nd	nd	nd	nd
427780	0.03	0.09	0.05	nd	nd	nd
427781	nd	nd	nd	nd	nd	nd
427782	nd	nd	nd	nd	nd	nd
427783	nd	nd	nd	nd	nd	nd
427784	nd	nd	nd	nd	nd	nd
427785	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd
Maximum	0.03	0.09	0.05	0.09	0.05	0.00
Standard Dev.	0.01	0.02	0.01	0.02	0.01	0.00
Mean	0.00	0.00	0.00	0.01	0.00	0.00

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

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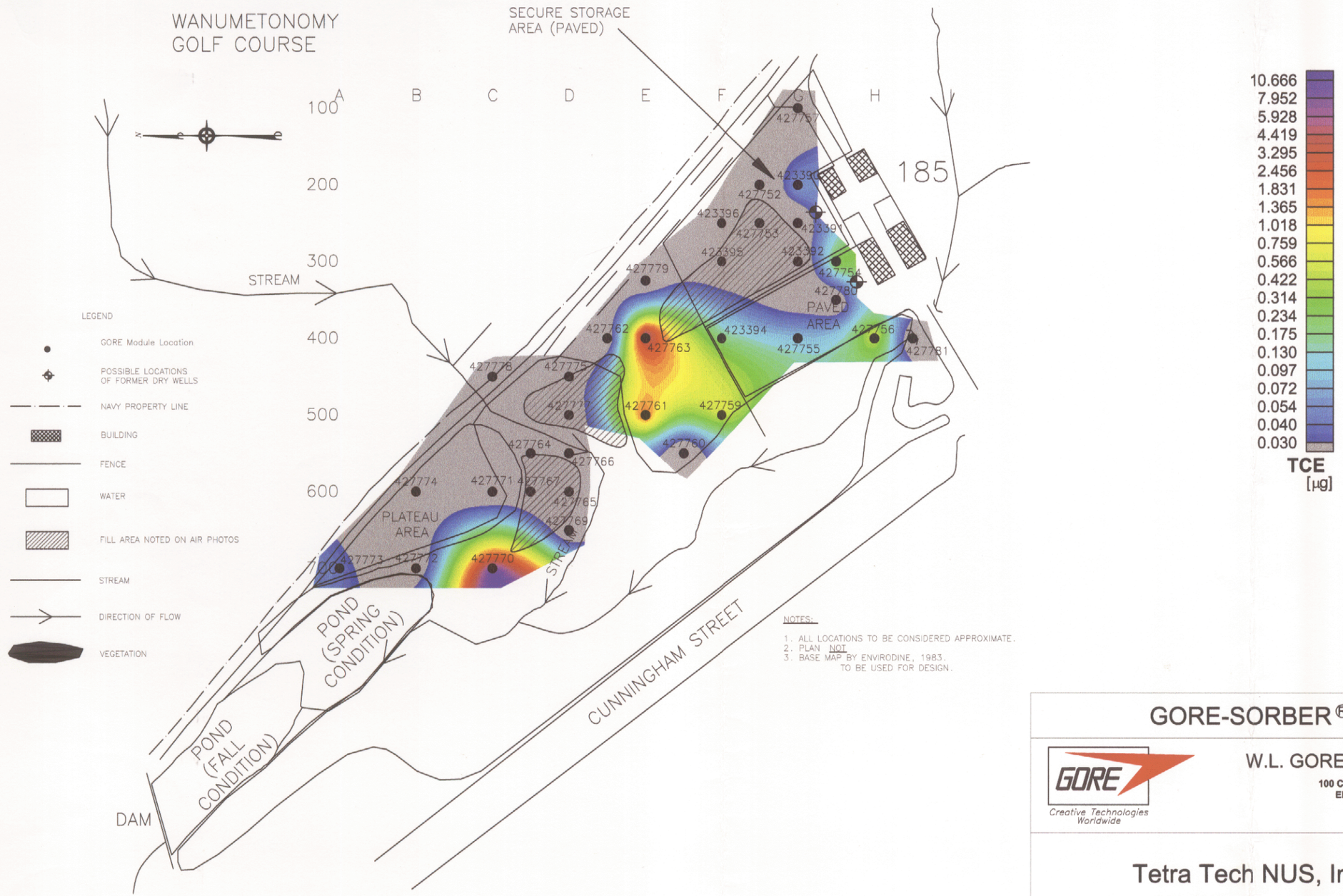

GORE-SORBER® Screening Survey

W.L. GORE & ASSOCIATES, INC.
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ELKTON, MD, USA 21921
USA
(410) 392-7600

Creative Technologies Worldwide

Tetra Tech NUS, Inc., Wilmington, MA
NUSC Disposal Area, Newport, RI
Trichloroethene

DATE DRAWN: 31 July 2003	DRAWN BY: JH	ORIG. CAD: FIG_2-1.DWG	SITE CODE: CKS
REV. DATE:	REV. #:	PROJECT NUMBER: 11473462	

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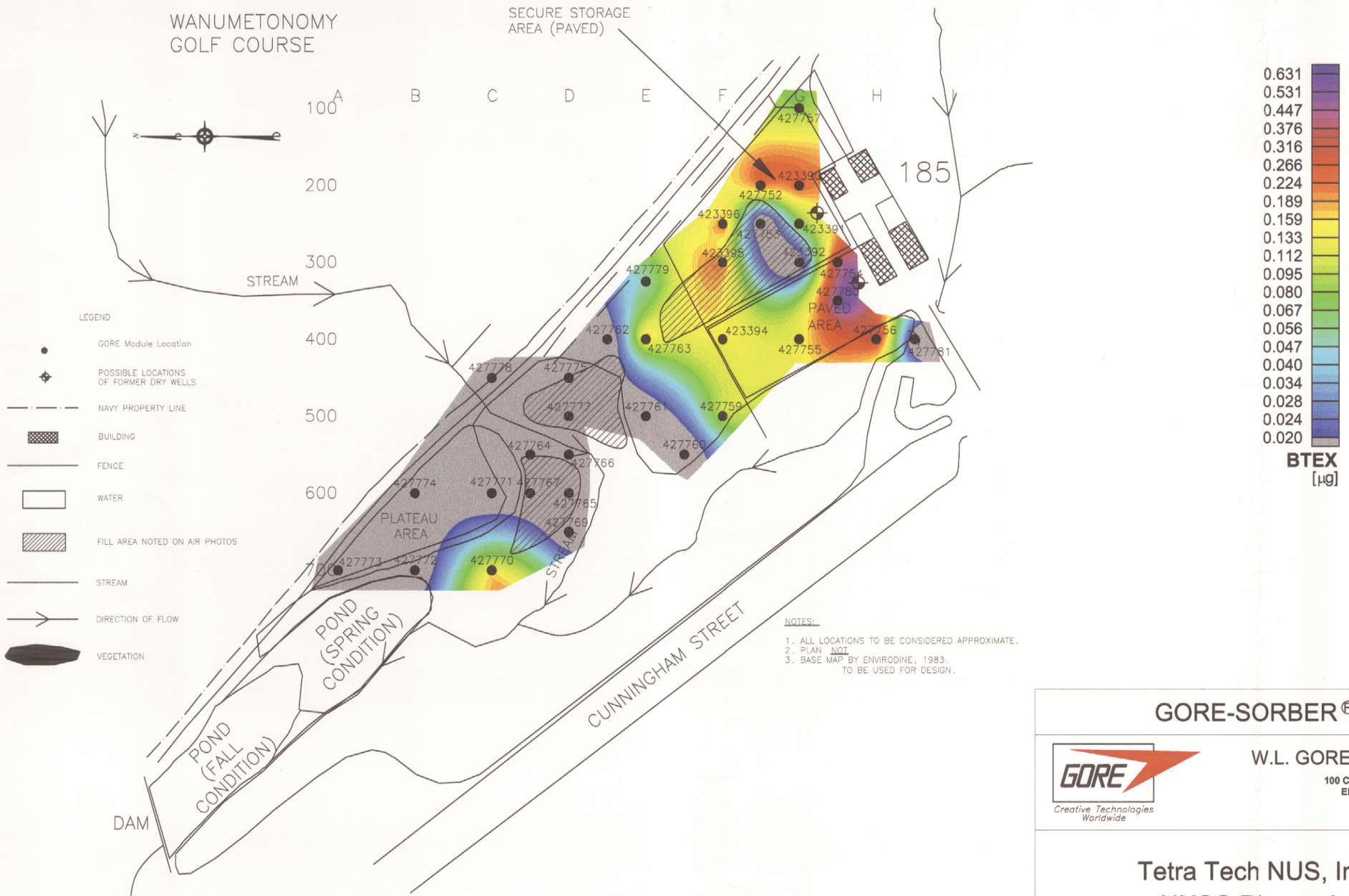

NOTES:

1. ALL LOCATIONS TO BE CONSIDERED APPROXIMATE.
2. PLAN NOT
3. BASE MAP BY ENVIRODINE, 1983.
TO BE USED FOR DESIGN.

Scale 1:1800

100 0 100 200 300

feet

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Creative Technologies Worldwide

Tetra Tech NUS, Inc., Wilmington, MA
NUSC Disposal Area, Newport, RI
BTEX

DATE DRAWN: 31 July 2003	DRAWN BY: JH	ORIG. CAD: FIG_2-1.DWG	SITE CODE: CKS
REV. DATE:	REV. #:	PROJECT NUMBER: 11473462	

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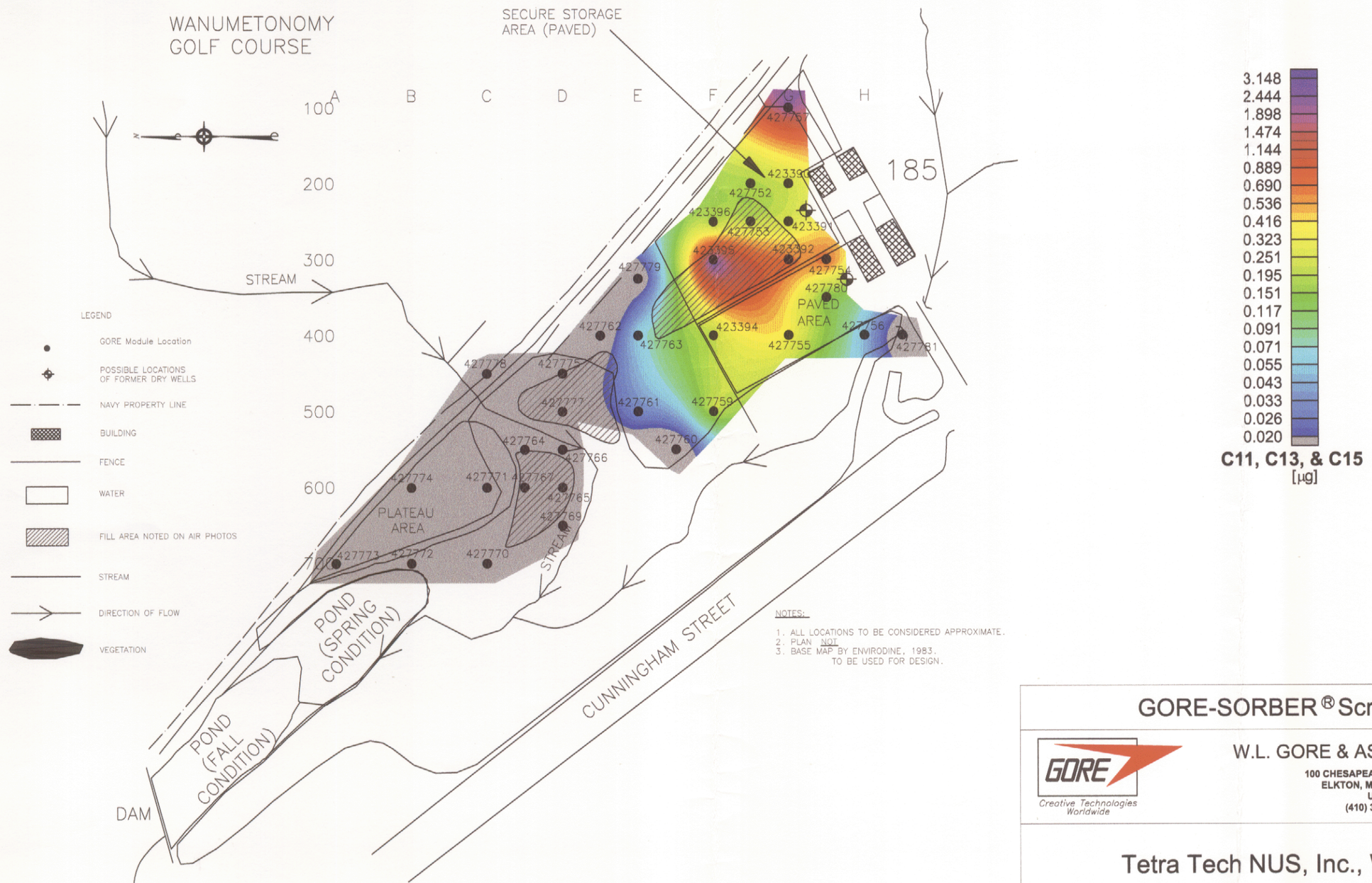

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Creative Technologies Worldwide

Tetra Tech NUS, Inc., Wilmington, MA
NUSC Disposal Area, Newport, RI
Undecane, Tridecane, & Pentadecane

DATE DRAWN: 31 July 2003	DRAWN BY: JH	ORIG. CAD: FIG_2-1.DWG	SITE CODE: CKS
REV. DATE:	REV. #:	PROJECT NUMBER: 11473462	

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APPENDIX E

SITE ECOLOGICAL CHARACTERIZATION

APPENDIX E
ECOLOGICAL SCREENING CHARACTERIZATION
NUSC DISPOSAL AREA
SEPTEMBER 2003

1.0 Site Location

The NUSC Disposal Area (the site) is located on the northwestern edge of the Naval Underwater Weapons Center (NUWC), formerly called the Naval Underwater Systems Center (NUSC). The NUSC Disposal Area occupies approximately one acre north of Building 1170 and Cunningham Street in the NUWC area. The location of the NUSC Disposal Area, relative to other study areas within the Newport Naval Base, is shown on Figure 1. The site and immediate surroundings are provided on Figure 2.

The site can be divided into seven major areas as described in this section. These areas are depicted on Figure 2 of this report.

North Meadow
South Meadow
Paved Gated Storage Area
Paved Open Storage Area
Deerfield Stream and Wetlands
Unnamed Stream
NUWC Pond (Deerfield Pond)

The North and south meadows are so designated as they are currently level and open from large vegetation. NUWC personnel indicated that these areas were periodically mowed up until approximately 2000. The north and south meadows are separated by the unnamed stream that flows in from the north east and is bordered to the north by the Wanumetonomy Golf Course.

There is a large paved area to the south end of the site, and this is divided into two subsections. One is a storage area that is secured by chain link fencing and gated (Paved

Gated Storage Area), and the other is open to traffic (Paved Open Storage Area). Both paved areas are used for large materials storage, including storage crates, boxes, jigs, molds and buoys. In the open storage area, a large steel jig is standing, approximately two stories in height, constructed on concrete footings and stayed with steel cables.

The north and east boundary of the site contains an access road that is used for fence patrol. The roadway is unpaved one lane wide and covered with crushed stone. The South and west boundary of the site is presumed to be Deerfield Creek, and the pond that it feeds.

The topography is such that the surface gradient is down to the north west. The Deerfield stream, the wetlands and the pond form a steep valley from the leveled meadow areas described above. Figure 2 presents the topography of the area as determined by a photogrammetric evaluation of aerial mapping information collected in 1996. The site appears to lie adjacent to an historic valley that was filled or leveled from east to west, providing usable storage areas.

2.0 METHODOLOGY

An ecological screening characterization of the site was performed, in part, through the performance of a site walkover by a qualified ecologist. This walkover was performed to:

- Identify the types and spatial extent of habitats that are present on and around the site.

- Identify the species and biological communities on and adjacent to the site that may use these habitats and that may be potential receptors of contaminants that may be present in soils, sediments, and surface waters at the site.

- Identify onsite and adjacent wetlands, if appropriate, and their approximate boundaries; provide sketch maps of the wetland boundaries relative to the site.

The habitats of the area were characterized to identify the nature and composition of non-marine flora and fauna communities in the vicinity of the site to provide a basis for

identifying potential receptors. The marine ecosystem approximately 600 feet northwest of the site was not characterized in this study. A literature review was performed to provide background information of the habitats and species of flora and fauna expected to occur on the site and in nearby areas, and on the use of the general area by migrating or over-wintering species.

RIDEM and USFWS, Office of Endangered Species, were contacted by TtNUS and requested to identify endangered, protected, or threatened species that may inhabit, or use the Newport area and the environments associated with the site. These response letters are provided as Attachment B of this Appendix.

Field verification of the types of habitat and wildlife on and near the site was performed in August, 2003. This assessment was performed to provide site-specific observations concerning the diversity (type) of species rather that data for assessing the population structure or community analysis. Since the objective is to provide an inventory of flora and fauna on site, the survey was qualitative rather than quantitative.

During the survey, observations were made on major flora in habitat areas; bird, amphibian, reptile, fish, and mammal sightings; or physical evidence of these, e.g., nesting sites, tracks, scat, et cetera.

Observations were recorded in several ways:

- A base map was used to mark the locations of major habitat types.
- Observations and notes were recorded by the biologist in a field log book.

Data on the presence of fauna and flora were made through visual observations conducted during the week of August 4 through August 8, 2003. Meander surveys were conducted by walking through each zone and recording flora and fauna species observed. Dominant vegetation based on aerial cover was recorded for the tree canopy, sapling/shrub, vine, and herbaceous ground cover vegetation. The site and surrounding habitats were consistently reviewed for the presence of birds and other signs of wildlife species. Wetland areas were noted and recorded on a site figure but were not field delineated

Lists of the flora and fauna were produced for inclusion in the report. These lists are species-specific where possible. The method for species identification (i.e., visual sightings, identification by tracks or other physical evidence , and audible identification, is included on the wildlife list. The inventory should not be considered a comprehensive list of flora or fauna that are present or utilize the site since field observation data was only collected over a short duration of a single season.

Flora and fauna surveys were completed within each habitat zone (i.e. open field, stream valley, etc.). Habitat characteristics for the site were mapped through photo interpretation of aerial photographs and onsite field observations and sketches. The habitat features were delineated and are presented on Figure 2. The habitat map was digitized into an AutoCAD file for area calculations and presentation.

3.0 RESULTS

This section presents a general description of the environmental setting of the NUSC Disposal Site and surrounding habitat and does not include the marine environment near the site. For simplicity, only the common names for observed flora and fauna species are presented in the text, however the proper scientific name is associated with the common name in species lists in Attachment A.

Two major plant communities were identified in the study area: upland grassland and scrub/shrub vegetation and the basin area with the streams, pond, and non-tidal wetland vegetation. The areas encompassing the plant communities has been identified on Figure 2. The paved storage area is not vegetated and is not considered to provide valuable habitat, therefore it is not reviewed in any detail in this report. Figure 2 presents the boundaries of the Ecological Characterization study area and its' habitat communities.

3.1 Environmental Setting

The site can be physically characterized as an elevated stream embankment area (plateau) which borders the NUWC Pond to the west, Deerfield Creek to the southwest, and the golf

course to the north/northeast. A second small unnamed stream also flows through the northern portion of the site, generally in an east-west direction. The unnamed stream originates from the golf course north/northeast of the site. This small stream joins with Deerfield Creek (the primary stream) west of the site and flows into the pond. The study area topography is highly variable, with topographic relief of approximately 15 to 20 feet from the northern to the southern portions of the site.

NUWC Pond is a freshwater pond that is formed in a basin area at a significantly lower elevation than the northeastern and southwestern uplands that form its two sides. The open water impoundment area varies from approximately 1.5 - 2 acres in area depending on the amount of surface water availability. During heavy rainfall events or spring melts the open water portion of the pond expands and extends into the lowlands at the south end of the pond.

A concrete dam and spillway are present at the northern end of the pond. The water that enters spillway flows through an underground pipeline that eventually discharges to Narragansett Bay in the vicinity of the McAlister Point Landfill. During major storm events, water has overflowed the dam headwall and flowed downhill in a northwesterly direction to a low lying area. This low-lying area has a surface inlet that feeds into the same storm drain system that discharges to Narragansett Bay.

The pond ranges in depth from approximately 10 feet (when measured from the top of the concrete dam) to less than one foot in depth at the southern end. The water in the pond has historically been used by the golf course as a source of irrigation water. During periods of high use, the water has dropped to approximately 3 feet (elevation of pump intake) in depth at the dam. The pond is classified as open water habitat with a narrow and sporadic fringe of emergent vegetation along the pond edge. A more significant density of emergent wetland vegetation is located at the southern end of the pond. Near the dam, the pond substrate consists of organic mucky silt with some sand. The pond substrate gradually increases in sand content in the direction of the stream outlets at the southern end of the pond.

Water flows into the pond from Deerfield Creek from the southwest and an unnamed stream from the Wanumetonomy Golf & Country Club to the east (Figure 2). In addition,

storm water is discharged to the basin through outfalls from the NUWC facility storm drain network. The two streams are generally shallow in depth (ranging from a few inches to 20 inches in depth) and typically range from 2 to 4 feet in width. The stream substrates are a combination of boulder, cobble, gravel and sand. It is apparent, based on field observations, that there are high flow conditions in the stream channels that have scoured and removed much of the fines from the streambeds. The fines have been deposited in the low gradient end of the streams and pond.

Vegetation on the site consists primarily of grasses, shrubs, saplings, and vines with some mature trees. The plateau-like area described above is primarily an open grassland and scrub/shrub area and much of the stream valley basin has a dense scrub/shrub cover. Most of the mature tree canopy in the study area is present along the steep embankment of the stream valley and with sporadic trees within the stream valley basin.

Habitats dispersed throughout and adjacent to the site are characteristic of fragmented, developed landscapes of lightly industrialized/commercial areas in the New England region. Most of the immediate area precipitation flows towards the streams and pond and is eventually discharged to Narragansett Bay. Approximately 30 percent of the study area is covered by pavement, with the remaining area providing some habitat value. Most of the study area is encircled by chain-link fence that separates if from off-site areas (golf course) except the unfenced western boundary along Cunningham Street. Access to the NUWC area is restricted to onsite Naval and contractor personnel. The unpaved roadway along the northeastern perimeter is used for walking and jogging by base personnel.

Upland Habitat – Unpaved Areas and Basin Area Embankment

This area is bounded on the north and east by the Wanumetonomy Golf and Country Club fairways, on the south by the "paved storage area", and on the west by lower stream valley and open water pond (Figure 2). The area includes approximately 3 acres.

Upland open grassland and early success ional scrub/shrub vegetation occupies approximately 2 acres of this area. The grassland area is characterized by a dense groundcover of herbaceous perennials while the surrounding scrub/shrub canopy is

characterized by a dense cover of woody shrubs, saplings, and young trees. Areas of this vegetation are punctuated by small, dense thickets of saplings. This type of vegetation is typical of old fields and other abandoned upland sites recently subjected to human disturbance. A list of observed flora and fauna species observed is presented in Appendix A.

Herbaceous species that are common in this community, as measured by their dominance, include tall fescue, goldenrods, chicory, common ragweed, tansy, white sweet clover, knapweed, Queen Anne's lace, blackberry, and poison ivy. These species are fairly uniformly distributed across this plant community with the exception of poison ivy which is more generally found in patches along the field or roadway edges.

Common vines and woody shrubs in this plant community include bittersweet, multiflora rose, sumacs (staghorn and smooth), autumn olive, northern arrowood, honeysuckle, and bayberry. Common saplings and young trees include red oak, white pine, red maple, quaking aspen, black locust, black cherry, eastern cottonwood, and sycamore maple. Mature trees were typically found along the stream valley bank which appears to have been somewhat less disturbed in most areas, allowing for more mature tree growth. Tree canopy is generally represented by sycamore maple and red oak species. Much of the woody vegetation along the edge of the open field areas is covered by dense cover of bittersweet or multiflora rose.

Basin Area- Wetland Stream Valley and Pond

In the basin area, wetland scrub/shrub vegetation occupies approximately 0.5 acres, emergent wetland approximately 0.5 acres, and with open water habitat including approximately 2 acres. The vegetation is characterized by woody shrubs and vines and herbaceous perennial species tolerant of extended periods of seasonally poor drainage. Upland scrub/shrub habitat is also present in the stream valley basin.

The stream valley and pond edge vegetation is characterized by a dense scrub/shrub cover. These include northern arrowood, bittersweet, multiflora rose, eastern cottonwood, honeysuckle, speckled alder, autumn olive, black cherry, white willow, and

elderberry. Throughout much of the stream valley and pond edge the bittersweet forms a dense, almost impenetrable barrier (to humans) over much of the shrub vegetation.

Herbaceous species only occupied a relatively small percentage of the stream valley and pond habitat and were primarily found along the southern edge of the pond and sporadically along the stream channel edge. Herbaceous species that are common in this community include jewelweed, stinging nettle, blue flag, swamp-beggar's tick, and skunk cabbage.

Non-Habitat Area – Paved Storage Area

The storage area is paved with asphalt and is not considered to provide habitat or beneficial ecological functions in the study area, therefore, is not described in more detail in this report.

4.0 WILDLIFE INVENTORY

The highly fragmented habitat, large open paved areas, chain-link fence around most of the study area, and the minimal quality habitat (NETC facility and golf course) surrounding the study area limit the range of terrestrial, wetland, and avian species expected to utilize the site. However, the dense vegetation in the study area does provide cover, foraging, and breeding/nesting areas for birds, mammals, reptiles, and amphibians that do not require large home ranges. The pond and streams provide a local important freshwater source for wildlife. Additionally, migratory birds are expected to utilize this area for resting and foraging during migration.

A species list for birds, mammals, amphibians, and reptiles that were observed on the site are presented in Attachment A. The species lists were made from observations conducted during meander surveys of the area and during sediment sampling in the stream valley and pond. The list should not be considered a conclusive list of wildlife that may utilize the on-site habitats and resources. Some species were qualified as "potentially present" based mostly on based on interviews with Navy employees walking the site and the potential for utilization of the habitats (either transient or permanent) by the listed species.

It is very likely that the meadow areas and stream valley/pond habitat support a much more diverse and varied fauna population than was observed during the meander survey. This is due to the seasonal and short duration of the study and the difficulty with movement through much of the area because of the dense vegetation.

Birds

During the August 2003 field investigation, both mature and immature black-crowned night herons were observed in the stream valley habitat and appear to be using the area as breeding and resting habitat. Other avian species observed included a Canadian geese, Great egret, and mallard ducks foraging in the pond. A list of avian species observed in the study area vicinity is presented in Attachment A.

Mammals

The following mammals were observed on site during the 2003 fieldwork: red fox, cottontail rabbit, eastern chipmunk. White-tailed deer and raccoon sign (tracks) were observed along the unnamed stream. In addition, coyote have been observed onsite. A list of mammals that were observed on site is presented in Attachment A.

Reptiles/Amphibians/Fish

The eastern garter snake, eastern toad, snapping turtle, green frog, and bluegill sunfish were observed in the pond area during sediment sampling during the August 2003 fieldwork.

Endangered Species

According to the USFWS (DOI 11/6/03) and Rhode Island Natural Heritage Program (RIDEM 10/7/03), no species of special concern or ecologically significant natural communities are present at or near the study area.

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APPENDIX E, ATTACHMENT A
OBSERVED SPECIES LISTS
NUSC DISPOSAL AREA
MIDDLETOWN, RHODE ISLAND
August 4 – 8, 2003

UPLAND PLANTS

Common Name	Scientific Name
Autumn olive	*Elaegnus umbellate*
Bayberry, Northern	*Myrica pennsylvanica*
Bittersweet	*Celastrus scandens*
Black cherry	*Prunus serotina*
Black locust	*Robinia pseudoacacia*
Blackberry	*Rubus Allegheniensis*
Bracken fern	*Pteridium aquilinum*
Broomsedge	*Andropogon virginicus*
Chicory	*Cichorium intybus*
Choke cherry	*Prunus virginiana*
Common mullein	*Verbascum thapsus*
Common plantain	*Plantago sp.*
Common ragweed	*Ambrosiaartemiisifolia*
Common yarrow	*Achillea millefolium*
Crownvetch	*Coronilla varia*
Eastern Red Cedar	*Juniperus virginiana*
Grape	*Vitis spp.*
Gray birch	*Betula populifolia*
Greenbriar	*Smilax rotundifolia*
Hawthorne	*Cretaegus sp.*
Hazelnut, American	*Corylus Americana*
Honeysuckle, Bush	*Lonicera tatarica*
Honeysuckle, Japanese	*Lonicera japonica*
Honeysuckle, tartarian	*Lonicera tatarica*

APPENDIX E, ATTACHMENT A
OBSERVED SPECIES LISTS
NUSC DISPOSAL AREA
MIDDLETOWN, RHODE ISLAND
August 4 – 8, 2003

UPLAND PLANTS

Common Name	Scientific Name
Japanese knotweed	*Polygonum cuspidatum**
Knapweed, Black	*Centaurea maculosa*
Lance-leaved goldenrod	*Euthamia graminifolia*
Milkweed, Common	*Asclepias syriaca*
Morning glory	*Convolvulus arvensis*
Multiflora rose	*Rosa multiflora*
Norway maple	*Acer platonoides*
Poison ivy	*Toxicodendron radicans*
Pokeweed	*Phytolacca Americana*
Quaking aspen	*Populus tremuloides*
Queen Anne's lace	*Daucus carota*
Red maple	*Acer rubrum*
Red oak, northern	*Quercus rubra*
Rough-stemmed goldenrod	*Solidago rugosa*
Slippery elm	*Ulmus rubra*
Smooth sumac	*Rhus glabra*
Speckled alder	*Alnus rugosa*
Staghorn sumac	*Rhus typhina*
Sycamore maple	*Acer pseudoplatanus*
Tall fescue	*Festuca arundinacea*
Tansy	*Tanicetum vulgare*
White pine	*Pinus strobes*
White sweet clover	*Melilotis alba*
Willow	*Salix sp.*
Witch-hazel, common	*Hamamelis virginiana*

APPENDIX E, ATTACHMENT A
OBSERVED SPECIES LISTS
NUSC DISPOSAL AREA
MIDDLETOWN, RHODE ISLAND
August 4 – 8, 2003

STREAM VALLEY/POND WETLAND PLANTS

Common Name	Scientific Name
Black cherry	*Prunus serotina*
Arrow-leaved tearthumb	*Polygonum sagittatum*
Bittersweet	*Celastrus scandens*
Bittersweet nightshade	*Solanum dulcamura*
Blue flag	*Iris versicolor*
Blue vervain	*Verbena hastate*
Cattail, Common	*Typha latifolia*
Choke cherry	*Prunus virginiana*
Cinnamon fern	*Osmunda cinnamomea*
Duckweed	*Lemna minor*
Eastern cottonwood	*Populus deltoids*
Elderberry	*Sambucus canadensis*
Goldenrod, Tall	*Solidago altissima*
Goldenrods, other	*Solidago spp.*
Jewelweed	*Impatiens capensis*
Maleberry	*Lyonia ligustrina*
marsh fern	*Thelypteris thelypteroides*
Meadowsweet	*Spirea latifolia*
Meadowsweet	*Spirea spp.*
Morning glory	*Convolvulus arvensis*
Morning glory	*Convolvulus arvensis*
Multiflora rose	*Rosa multiflora*
Nannyberry	*Viburnum lentago*
Northern arrowood	*Viburnum recognitum*
Poison-ivy	*Toxicodendron radicans*
Pondweeds	*Potamgeton spp.*

APPENDIX E, ATTACHMENT A
OBSERVED SPECIES LISTS
NUSC DISPOSAL AREA
MIDDLETOWN, RHODE ISLAND
August 4 – 8, 2003

STREAM VALLEY/POND WETLAND PLANTS

Common Name	Scientific Name
Purple loosestrife	*Lythrum salicaria*
Red maple	*Acer rubrum*
Red oak, northern	*Quercus rubra*
Reed canary grass	*Phalaris arundinacea*
Rought-stemmed goldenrod	*Solidago rugosa*
Scirpus (unidentified)	*Scirpu sp.*
Sensitive fern	*Onoclea sensibilis*
Silky dogwood	*Cornus amomum*
Skunk cabbage	*Symplocarpus foetidus*
Smartweed	*Polygonum sp.*
Soft rush	*Juncus effuses*
Speckled alder	*Alnus rugosa*
Steeplebush	*Spiraea tomentosa*
Stinging nettle	*Urtica dioica*
Swamp-beggar's tick	*Bidens connata*
Sweet goldenrod	*Solidago odorata*
Tall meadow-rue	*Thalictrum pubescens*
Wild rice	*Zizania aquatica*
White oak	*Quercus alba*
Willow	*Salix sp.*
Witch-hazel, Common	*Hamamelis virginiana*
Witch-hazel, common	*Hamamelis virginiana*
Wood anemone	*Anemone quinquefolia*
Wool-grass	*Scirpus cyperinus*

APPENDIX E, ATTACHMENT A
OBSERVED SPECIES LISTS
NUSC DISPOSAL AREA
MIDDLETOWN, RHODE ISLAND
August 4 – 8, 2003

Common Name	Scientific Name	Habitat Requirements[1]	Key Food Habits[1]	Important Functions[1]
American crow	*Corvus brachyrynchos*	Interior and edges of open deciduous, coniferous, and mixed forests and woodlots. Prefers woodland with adjacent farmland.	Major foods: Omnivorous, taking mammals (mainly carrion), insects, small birds (nestlings), fruit, garbage, and grain.	Common, Will overwinter in New England; will congregate in coastal areas where food is more accessible.
American goldfinch	*Carduelis tristis*	Open weedy fields, pasture with scattered trees, forest edges	Major foods: insects, buds, succulent vegetation in summer; seeds of weeds, birches, alders, conifers in winter	Wintering: present in New England and common at feeding stations.
American robin	*Turdus migratorius*	Open woodland edges and clearings, fields, orchards, shade trees in residential areas.	Major foods: Wild and cultivated fruits, earthworms, insects.	Will overwinter in New England. Frequents sheltered wooded areas and feeds on persistent wild and cultivated fruits.
Black-capped chickadee	*Parus atricapillus*	Deciduous or coniferous woodlands, frequents both heavily forested and residential areas.	Major foods: insects, seeds, fruits.	Wintering: frequent city parks and residential areas with feeding stations adjacent to breeding habitat.
Black-crowned night heron	*Nycticorax nycticorax*	Breeding habitat is varied, occupies fresh, brackish, and salt water areas.	Major foods: fishes, crustaceans, mollusks, worms, aquatic terrestrial insects, reptiles and amphibians, occasionally young birds and mammals	Wintering: Coastal wetlands and islands; Range is permanent in RI
Blue jay	*Cyanocitta cristata*	Prefers mixed woodlands, wooded islands, farms, cities, suburbs, parks.	Major foods: seeds, fruits, mast, occasionally takes insects, nestlings, young mice. Acorns are staple food item throughout the year.	Will overwinter in New England but some northern birds move to more southern New England.
Brown-headed cowbird	*Molothrus ater*	Open coniferous and deciduous woodlands and edges	Major foods: seeds of weeds, grasses, grains, insects.	Will overwinter in RI using agricultural land and feeding stations.
Canada goose	*Branta Canadensis*	Shallow waterbodies with abundant plant foods.	Tender shoots of grasses, sedges, and other marsh plants, submerged vegetation, cultivated grains, wild seeds, and fruits.	Wintering: in New England where bare ground and open water
Field sparrow	*Spizella pusilla*	Old fields with scattered woody vegetation, also briar thickets and woodland edges	Major foods: insects (>40%) in summer, with weed seeds and grasses.	Will overwinter in southern New England

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APPENDIX E, ATTACHMENT A
OBSERVED SPECIES LISTS
NUSC DISPOSAL AREA
MIDDLETOWN, RHODE ISLAND
August 4 – 8, 2003

Common Name	Scientific Name	Habitat Requirements[1]	Key Food Habits[1]	Important Functions[1]
Grackle, Common	*Quiscalus quiscula*	Farmlands, suburbs, marshes, meadows	Major foods: ground-dwelling insects, fruits, mast, waste grains, small quantities of fish. Amphibians, nestlings, and eggs.	Will overwinter in RI in areas with open water and bare ground.
European starling	*Sturnus vulgaris*	Farms, cities, orchards, gardens, parks.	Major food: Insects, seeds, fruits, grain.	Overwinters in New England. Wintering: roost in dense vegetation or on buildings.
Herring gull	*Larus argentatus*	Mainly breeding on islands in estuaries, rivers, and lakes or coastal beaches.	Major foods: fish and shell fish, offal from fishing boats and fish processing plants; Also scavenge along shoreline and garbage dumps	Wintering: same as breeding habitat except where water bodies freeze over
Great blue heron	*Ardea herodias*	Shallow shores of ponds, lakes, streams, rivers, etc.	Major Foods: Aquatic and terrestrial insects, fishes, amphibians, reptiles, crustaceans, and occasionally small birds and mammals.	Wintering: mainly coastal areas with bare ground and open water in New England
Killdeer	*Characdrius vociferus*	Heavily grazed meadows, edges of pasture ponds, dry uplands	Major foods: insects, centipedes, spiders, worms, snails, crayfish, weed seeds.	Will overwinter in RI in plowed or sparsely vegetated fields, coastal flats and beaches, river and lake shores that are free of ice.
Mallard	*Anas platyrhynchos*	Ponds, lakes, rivers, swamps, etc. Prefers water less than 16" deep, avoids salt water	Major foods: seeds of sedges, grasses and smartweed are staples; also eats leaves, stems and seeds of other marsh plants, snails, and insects.	Wintering: Coastal marshes, inland ice-free ponds and rivers
Morning Dove	*Zenaida macroura*	Open land with bare ground that produces adequate food seeds	Major foods: weed seeds, occasionally takes small snails. Walking and ground gleaning.	Common in New England. Overwinters in New England
Red-winged blackbird	*Agelaius phoeniceus*	Marshes, swamps, wet meadows, ponds, dry fields. Prefers wetlands with extensive emergent growth.	Major foods: insects, weed seeds, grain.	Migratory, New England provides breeding habitat.
Snowy egret	*Egretta thula*	Shallow shores of ponds, lakes, streams, rivers, etc.	Major Foods: Prefers fish; also insects, amphibians, crustaceans,	Migratory, New England provides breeding habitat.
Tree swallow	*Techycineta bicolor*	Cavity for nesting. Open feeding areas such as meadows, marshes, or water.	Major foods: Flying insects in summer berries and seeds are taken as a supplement when insects are less abundant.	Migratory, New England provides breeding habitat.

[1] - Sources: DeGraff and Rudis 1986; Martin, Zim, and Nelson, 1951; Redington, 1994; Sibley, 2000; Audubon Society, 1983

APPENDIX E, ATTACHMENT A
OBSERVED SPECIES LISTS
NUSC DISPOSAL AREA
MIDDLETOWN, RHODE ISLAND
August 4 – 8, 2003

MAMMALS

Common Name	Scientific Name	Habitat Requirements[1]	Key Food Habits[1]	Important Functions[1]
Cottontail, Eastern	*Sylvilagus floridanus.*	Open fields, fallow fields, open woodlands, thickets, swamps and marshes, suburban areas with adequate food and cover.	Crepusular and nocturnal feeder. Summer foods: tender parts of grasses and herbs. Winter foods: bark, twigs and buds of shrubs and young trees such as maple, birch, and oak	Home range size ranges from ½ to 40 acres.
Coyote	*Canis latrans*	Edges of second growth forest, open brushy fields. Open or semi-open country for hunting and secluded den sights	Opportunistic feeders consuming mainly carrion, small live vertebrates, invertebrates, and vegetation.	Habitat range size may exceed an area 5 miles in diameter depending on food supply and time of year.
Eastern chipmunk	*Taniias striatus*	Edges or interiors of deciduous woodlands with abundant cover of undergrowth, old logs, stone walls. Semi-open brushlands with ample cover.	Many kinds of seeds, fruits, nuts, bulbs, insects, meat, and eggs. Feeds during daylight hours.	Home range is typically less than 91 m in diameter or 0.5 to 1 acre.
Gray squirrel	*Sciurus carolinensis*	Deciduous and mixed forests or woodlots, especially those with trees that produce mast.	Diurnal feeder. Consumes nuts, buds, seeds and grains, fungi, fruits, birds' eggs, inner bark of trees. Will eat insects and then pupae in spring and summer when preferred foods are scarce.	Home range size is 2 to 7 acres depending on food availability and weather.
Raccoon[S]	*Procyon lotor*	Wooded areas interrupted by fields and water courses. Commonly found in wetlands near human habitation.	Omnivorous and opportunistic. Animal matter is the major food in spring and early summer. Fruits and seeds are eaten in summer, fall, and winter. Crayfish, worms, insects, carrion, tender buds and shots, grass, and garbage are typical foods.	The home range is usually between 1 and 3 km in diameter. Size varies with individual, food availability, and weather.
Red fox	*Vulpes vulpes*	Found in a variety of habitats. A mixture of forest and open areas is preferred. Edges used heavily	Opportunistic feeders consuming animals ranging from insects to small mammals. Commonly takes birds, turtles, frogs, snakes and their eggs. Berries and fruits when available.	Home range size is less than 3 miles in diameter. Home range is shared by a male-female pair and seasonally by their pups.
Whitetail deer[S]	*Odocorleus viginianus*	Forest edges, swamp borders, areas interspersed with fields and woodland openings. In winter (when snow exceeds 16") will "yard" in stands of conifers forming a central resting area with trails packed through snow.	Mainly crepuscular. Beer browse on a variety of woody deciduous plants and some coniferous growth, feeding on twigs and stripping young bark. Adaptable in its food habits.	Home range size is generally 2 to 3 square miles. Size depends on quality of the habitat. Home range is from 40 acres in excellent habitat to300 acres in poor habitat.

[1] - Sources: DeGraff and Rudis 1986; Martin, Zim, and Nelson, 1951; Redington, 1994; Audubon Society, 1983

APPENDIX E, ATTACHMENT A
OBSERVED SPECIES LISTS
NUSC DISPOSAL AREA
MIDDLETOWN, RHODE ISLAND
August 4 – 8, 2003

Reptiles, Amphibians and Fish

Common Name	Scientific Name	Habitat Requirements[1]	Key Food Habits[1]	Important Features[1]
Bluegill sunfish	*Lepomis macrochirus*	Clear warm pools of streams, ponds or reservoirs, usually in shallow water with vegetation	Young consume zooplankton, switching to aquatic insects at maturity. Small mouth size limits the size of food particles ingested and almost dictates a diet of insects and similar small organisms. While insects remain the staple food item for adults, crayfish, snails, small fish, and fish eggs are also consumed. Algae and other vegetation are eaten when normal food items are scarce.	Common sunfish and popular gamefish. Commonly stocked in ponds as forage for larger fishes.
Eastern American toad	*Bufo a. americanus*	Found in almost any habitat with cover, damp soils and food supply	Terrestrial arthropods including insects, sowbugs, spiders, centipedes, and millipeds, slugs, and earthworms.	Small home range. Returns to breeding sites.
Eastern garter snake	*Thamnophis s. sirtalis*	Ubiquitous, terrestrial	Earthworms account for 80% of food items, also amphibians, carrion, fish, insects, small birds, and rodents.	Home range estimated at 5 acres
Green frog	*Rana clamitans melanota*	Riparian, inhabits margins of shallow fresh water	Terrestrial feeder among shoreline vegetation, insects, worms, small fish, crayfish spiders, and mollusks.	Home range of 20-200 square meters
Snapping turtle, Common	*Chelydra s. serpentina*	Bottom dweller in fresh or brackish water; almost entirely aquatic but will travel over land.	Omnivorous feeder; scavenges for food readily available; animal matter accounts for 54% of prey items including fish (40%) crayfish, aquatic invertebrates, reptiles, birds, mammals; plant material (37%).	Quite migratory distance ranging from 100 m to 1.1 km; females exhibit strong nesting site fidelity; home range from 4.5 to 22.2 acres.

[1] - Sources: DeGraff and Rudis 1986; Martin, Zim, and Nelson, 1951; Redington, 1994; Audubon Society, 1983

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

DIVISION OF FISH AND WILDLIFE
Field Headquarters
P.O. Box 218
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RECEIVED
OCT 8 2003
TETRA TECH NUS, INC.
WILMINGTON, MA 01887-1020

Kevin O'Neill
Tetra Tech NUS, Inc.
55 Jonspin Rd.
Wilmington, MA 01887

7 October 2003

Mr. O'Neill,

This letter is in response to your query of 1 October 2003 (file N8856-3.2) regarding the Naval Underwater Weapons Center in Newport, Rhode Island.

There are no known endangered species or critical habitats in the vicinity of that site.

Sincerely,

Christopher J. Raithel

Principal Wildlife Biologist

cc: Enser
Lapisky

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087

November 6, 2003

Reference:	Project	Location
	Environmental investigation Naval Underwater Weapons Center	Newport, RI

Kevin O'Neill
Tetra Tech NUS, Inc.
55 Jonspin Road
Wilmington, MA 01887

NOV 10 2003

Dear Mr. O'Neill:

This responds to your recent correspondence requesting information on the presence of federally-listed and/or proposed endangered or threatened species in relation to the proposed activity(ies) referenced above.

Based on information currently available to us, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required.

This concludes our review of listed species and critical habitat in the project location(s) and environs referenced above. No further Endangered Species Act coordination of this type is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Thank you for your coordination. Please contact us at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Michael J. Amaral

Michael J. Amaral
Endangered Species Specialist
New England Field Office

APPENDIX F

ANALYTICAL RESULTS FROM SAMPLES COLLECTED

F1 – GROUNDWATER
F2 – SEDIMENT
F3 – SOIL
F4 – SURFACE WATER

F1

GROUNDWATER

APPENDIX F1
ANALYTICAL RESULTS - GROUNDWATER
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-A-MW01B-01		DA-A-MW-DUP08-01		DA-A-MW02B-01		DA-A-MW03B-01		DA-A-MW04B-01	
Sample Location	MW01B		MW01B		MW02B		MW03B		MW04B	
Date Sampled	9/4/2003		9/4/2003		9/3/2003		9/5/2003		9/4/2003	
QC Identifier	Field Dup. DA-A-MW01B-01		Field Dup. DA-A-MW01B-01		None		None		None	
Volatile Organic Analysis (UG/L)										
1,1,1,2-Tetrachloroethane	0.31	U	0.31	U	0.31	U	7.7	U	0.31	U
1,1,1-Trichloroethane	0.25	U	0.25	U	0.25	U	6.2	U	0.46	J
1,1,2,2-Tetrachloroethane	0.29	U	0.29	U	0.29	U	7.4	U	0.29	U
1,1,2-Trichloroethane	0.16	U	0.16	U	0.16	U	4	U	0.16	U
1,1-Dichloroethane	0.19	U	0.19	U	0.19	U	4.7	U	49	
1,1-Dichloroethene	0.38	U	0.38	U	0.38	U	9.4	U	0.38	U
1,1-Dichloropropene	0.34	U	0.34	U	0.34	U	8.5	U	0.34	U
1,2,3-Trichlorobenzene	0.38	U	0.38	U	0.38	U	9.6	U	0.38	U
1,2,3-Trichloropropane	0.22	U	0.22	U	0.22	U	5.6	U	0.22	U
1,2,4-Trichlorobenzene	0.28	U	0.28	U	0.28	U	6.9	U	0.28	U
1,2,4-Trimethylbenzene	0.25	U	0.25	U	0.25	U	6.4	U	0.25	U
1,2-Dibromo-3-chloropropane	1.6	U	1.6	U	1.6	U	39	U	1.6	U
1,2-Dibromoethane	0.22	U	0.22	U	0.22	U	5.6	U	0.22	U
1,2-Dichlorobenzene	0.15	U	0.15	U	0.15	U	3.8	U	0.15	U
1,2-Dichloroethane	0.14	U	0.14	U	0.14	U	3.5	U	0.14	U
1,2-Dichloropropane	0.24	U	0.24	U	0.24	U	6	U	0.24	U
1,3,5-Trimethylbenzene	0.27	U	0.27	U	0.27	U	6.8	U	0.27	U
1,3-Dichlorobenzene	0.2	U	0.2	U	0.2	U	5	U	0.2	U
1,3-Dichloropropane	0.17	U	0.17	U	0.17	U	4.3	U	0.17	U
1,4-Dichlorobenzene	0.23	U	0.23	U	0.23	U	5.8	U	0.23	U
2,2-Dichloropropane	0.63	U	0.63	U	0.63	U	16	U	0.63	U
2-Butanone	1.7	U	1.7	U	1.7	U	42	U	1.7	U
2-Chlorotoluene	0.24	U	0.24	U	0.24	U	5.9	U	0.24	U
2-Hexanone	1.8	U	1.8	U	1.8	U	45	U	1.8	U
4-Chlorotoluene	0.24	U	0.24	U	0.24	U	6.1	U	0.24	U
4-Methyl-2-Pentanone	0.4	U	0.4	U	0.4	U	10	U	0.4	U
Acetone	1.5	U	1.5	U	1.5	U	37	U	1.5	U
Benzene	0.29	U	0.29	U	0.29	U	7.3	U	0.29	U
Bromobenzene	0.15	U	0.15	U	0.15	U	3.7	U	0.15	U
Bromochloromethane	0.19	U	0.19	U	0.19	U	4.8	U	0.19	U
Bromodichloromethane	0.24	U	0.24	U	0.24	U	6	U	0.24	U
Bromoform	1.1	U	1.1	U	1.1	U	27	U	1.1	U
Bromomethane	0.36	U	0.36	U	0.36	U	8.9	U	0.36	U
Carbon Disulfide	0.27	U	0.27	U	0.27	U	6.8	U	0.27	U
Carbon Tetrachloride	0.38	U	0.38	U	0.38	U	9.4	U	0.38	U
Chlorobenzene	0.32	U	0.32	U	0.32	U	7.9	U	0.32	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F1
ANALYTICAL RESULTS - GROUNDWATER
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-A-MW01B-01		DA-A-MW-DUP08-01		DA-A-MW02B-01		DA-A-MW03B-01		DA-A-MW04B-01	
Sample Location	MW01B		MW01B		MW02B		MW03B		MW04B	
Date Sampled	9/4/2003		9/4/2003		9/3/2003		9/5/2003		9/4/2003	
QC Identifier	Field Dup. DA-A-MW01B-01		Field Dup. DA-A-MW01B-01		None		None		None	
Chloroethane	0.36	U	0.36	U	0.36	U	9	U	0.36	U
Chloroform	0.14	U	0.14	U	0.14	U	3.4	U	0.14	U
Chloromethane	0.12	U	0.12	U	0.12	U	3	U	0.12	U
cis-1,2-Dichloroethene	2.1		2.3		0.61		4.6	U	6.4	
cis-1,3-Dichloropropene	0.13	U	0.13	U	0.13	U	3.2	U	0.13	U
Dibromochloromethane	0.19	U	0.19	U	0.19	U	4.7	U	0.19	U
Dibromomethane	0.19	U	0.19	U	0.19	U	4.8	U	0.19	U
Dichlorodifluoromethane	0.3	U	0.3	U	0.3	U	7.5	U	0.3	U
Ethylbenzene	0.28	U	0.28	U	0.28	U	7	U	0.28	U
Hexachlorobutadiene	0.43	U	0.43	U	0.43	U	11	U	0.43	U
Isopropylbenzene	0.26	U	0.26	U	0.33	J	6.5	U	0.26	U
m&p-Xylene	0.38	U	0.38	U	0.38	U	9.6	U	0.38	U
Methyl tert-Butyl Ether	0.12	U	0.12	U	0.12	U	2.9	U	0.12	U
Methylene Chloride	0.37	U	0.37	U	0.37	U	9.2	U	0.37	U
Naphthalene	0.41	U	0.41	U	0.41	U	10	U	0.41	U
n-Butylbenzene	0.41	U	0.41	U	0.41	U	10	U	0.41	U
n-Propylbenzene	0.32	U	0.32	U	0.32	U	8	U	0.32	U
o-Xylene	0.3	U	0.3	U	0.3	U	7.6	U	0.3	U
p-Isopropyltoluene	0.33	U	0.33	U	0.33	U	8.3	U	0.33	U
sec-Butylbenzene	0.4	U	0.4	U	3.3		10	U	0.4	U
Styrene	0.44	U	0.44	U	0.44	U	11	U	0.44	U
tert-Butylbenzene	0.29	U	0.29	U	0.97	J	7.2	U	0.29	U
Tetrachloroethene	1.9		2.5		0.43	U	11	U	8.4	
Toluene	0.31	U	0.31	U	0.31	U	7.8	U	0.31	U
trans-1,2-Dichloroethene	0.34	U	0.34	U	0.34	U	8.5	U	0.34	U
trans-1,3-Dichloropropene	0.24	U	0.24	U	0.24	U	6	U	0.24	U
Trichloroethene	1.3		1.6		0.42	J	1500		3.6	
Trichlorofluoromethane	0.29	U	0.29	U	0.29	U	7.2	U	0.29	U
Vinyl Chloride	0.27	U	0.27	U	0.27	U	6.8	U	0.66	J
Semivolatile Organic Analysis (UG/L)										
1,2,4-Trichlorobenzene	1.2	UJ	1.2	UJ	1.2	U	1.2	UJ	1.3	UJ
1,2-Dichlorobenzene	1.3	U	1.3	U	1.3	U	1.3	U	1.4	U
1,2-Diphenylhydrazine	1.6	U	1.6	U	1.6	U	1.6	U	1.7	U
1,3-Dichlorobenzene	1.1	U	1.1	U	1.2	U	1.2	U	1.2	U
1,4-Dichlorobenzene	1.2	U	1.2	U	1.3	U	1.3	U	1.3	U
2,2'-oxybis(1-Chloropropane)	2.3	U	2.3	U	2.4	U	2.4	U	2.5	U

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APPENDIX F1
ANALYTICAL RESULTS - GROUNDWATER
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-A-MW01B-01		DA-A-MW-DUP08-01		DA-A-MW02B-01		DA-A-MW03B-01		DA-A-MW04B-01	
Sample Location	MW01B		MW01B		MW02B		MW03B		MW04B	
Date Sampled	9/4/2003		9/4/2003		9/3/2003		9/5/2003		9/4/2003	
QC Identifier	Field Dup. DA-A-MW01B-01		Field Dup. DA-A-MW01B-01		None		None		None	
2,4,5-Trichlorophenol	3.5	U	3.5	U	3.6	U	3.6	U	3.8	U
2,4,6-Trichlorophenol	3.5	U	3.5	U	3.6	U	3.6	U	3.8	U
2,4-Dichlorophenol	3.2	U	3.2	U	3.4	U	3.4	U	3.6	U
2,4-Dimethylphenol	3.5	UJ	3.5	UJ	3.7	UJ	3.7	UJ	3.9	UJ
2,4-Dinitrophenol	2.3	U	2.3	U	2.4	U	2.4	U	2.6	U
2,4-Dinitrotoluene	1.4	U	1.4	U	1.5	U	1.5	U	1.6	U
2,6-Dichlorophenol	2.3	U	2.3	U	2.4	U	2.4	U	2.5	U
2,6-Dinitrotoluene	1.5	UJ	1.5	UJ	1.5	UJ	1.5	UJ	1.6	UJ
2-Chloronaphthalene	1.5	UJ	1.5	UJ	1.6	UJ	1.6	UJ	1.7	UJ
2-Chlorophenol	3.2	U	3.2	U	3.3	U	3.3	U	3.5	U
2-Methylnaphthalene	4.2	UJ	4.2	UJ	4.4	UJ	4.4	UJ	4.6	UJ
2-Methylphenol	3.1	UJ	3.1	UJ	3.2	UJ	3.2	UJ	3.4	UJ
2-Nitroaniline	3.5	U	3.5	U	3.6	U	3.6	U	3.8	U
2-Nitrophenol	3	U	3	U	3.1	U	3.1	U	3.3	U
3,3'-Dichlorobenzidine	5.2	U	5.2	U	5.4	U	5.4	U	5.6	U
3+4-Methylphenols	2.8	U	2.8	U	2.9	U	2.9	U	3.1	U
3-Methylphenol	6	U	6	U	6.2	U	6.2	U	6.6	U
3-Nitroaniline	3.7	U	3.7	U	3.9	U	3.9	U	4.1	U
4,6-Dinitro-2-methylphenol	2.3	U	2.3	U	2.4	U	2.4	U	2.5	U
4-Bromophenyl-phenylether	1.7	U	1.7	U	1.8	U	1.8	U	1.9	U
4-Chloro-3-methylphenol	3.3	U	3.3	U	3.4	U	3.4	U	3.6	U
4-Chloroaniline	4.6	UJ	4.6	UJ	4.7	UJ	4.7	UJ	5	UJ
4-Chlorophenyl-phenylether	1.5	U	1.5	U	1.6	U	1.6	U	1.7	U
4-Nitroaniline	2.7	U	2.7	U	2.8	U	2.8	U	2.9	U
4-Nitrophenol	1.9	U	1.9	U	2	U	2	U	2.1	U
Acenaphthene	1.5	U	1.5	U	1.6	U	1.6	U	1.6	U
Acenaphthylene	1.6	U	1.6	U	1.7	U	1.7	U	1.8	U
Anthracene	1.4	U	1.4	U	1.5	U	1.5	U	1.6	U
Benzidine	44	U	44	U	46	UJ	46	U	49	U
Benzo(a)anthracene	1.5	U	1.5	U	1.6	U	1.6	U	1.7	U
Benzo(a)pyrene	1.6	U	1.6	U	1.7	U	1.7	U	1.8	U
Benzo(b)fluoranthene	1.5	U	1.5	U	1.6	U	1.6	U	1.6	U
Benzo(g,h,i)perylene	1.6	U	1.6	U	1.6	U	1.6	U	1.7	U
Benzo(k)fluoranthene	1.7	U	1.7	U	1.7	U	1.7	U	1.8	U
Benzoic acid	15	UJ	15	UJ	16	UJ	16	UJ	16	UJ
Benzyl Alcohol	3	U	3	U	3.1	U	3.1	U	3.3	U
Bis(2-Chloroethoxy)methane	1.7	U	1.7	U	1.8	U	1.8	U	1.9	U

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APPENDIX F1
ANALYTICAL RESULTS - GROUNDWATER
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-A-MW01B-01		DA-A-MW-DUP08-01		DA-A-MW02B-01		DA-A-MW03B-01		DA-A-MW04B-01	
Sample Location	MW01B		MW01B		MW02B		MW03B		MW04B	
Date Sampled	9/4/2003		9/4/2003		9/3/2003		9/5/2003		9/4/2003	
QC Identifier	Field Dup. DA-A-MW01B-01		Field Dup. DA-A-MW01B-01		None		None		None	
Bis(2-Chloroethyl)ether	1.8	U	1.8	U	1.8	U	1.8	U	1.9	U
bis(2-Ethylhexyl)phthalate	2.1	U	2.1	U	2.2	U	2.2	U	2.3	U
Butylbenzylphthalate	2.2	U	2.2	U	2.2	U	2.2	U	2.4	U
Carbazole	1.8	U	1.8	U	1.8	U	1.8	U	1.9	U
Chrysene	1.6	U	1.6	U	1.7	U	1.7	U	1.8	U
Dibenzo(a,h)anthracene	1.8	U	1.8	U	1.9	U	1.9	U	2	U
Dibenzofuran	3	UJ	3	UJ	3.1	UJ	3.1	UJ	3.2	UJ
Diethylphthalate	4.9	U	4.9	U	5.1	U	5.1	U	5.4	U
Dimethylphthalate	1.6	U	1.6	U	1.6	U	1.6	U	1.7	U
Di-n-Butylphthalate	1.9	U	1.9	U	2	U	2	U	2.1	U
Di-n-octylphthalate	1.8	U	1.8	U	1.9	U	1.9	U	2	U
Fluoranthene	1.8	U	1.8	U	1.8	U	1.8	U	1.9	U
Fluorene	1.4	U	1.4	U	1.5	U	1.5	U	1.6	U
Hexachlorobenzene	1.6	UJ	1.6	UJ	1.6	UJ	1.6	UJ	1.7	UJ
Hexachlorobutadiene	1.2	UJ	1.2	UJ	1.3	UJ	1.3	UJ	1.4	UJ
Hexachloroethane	1	U	1	U	1	U	1	U	1.1	U
Indeno(1,2,3-cd)pyrene	1.8	U	1.8	U	1.8	U	1.8	U	1.9	U
Isophorone	1.8	U	1.8	U	1.9	U	1.9	U	2	U
Naphthalene	1.4	U	1.4	U	1.5	U	1.5	U	1.6	U
Nitrobenzene	1.8	U	1.8	U	1.9	U	1.9	U	2	U
N-nitrosodimethylamine	5.1	U	5.1	U	5.4	U	5.4	U	5.6	U
N-Nitroso-di-n-propylamine	1.8	U	1.8	U	1.9	U	1.9	U	2	U
N-Nitroso-diphenylamine	1.9	U	1.9	U	2	U	2	U	2.1	U
N-nitrosopyrrolidine	2	UJ	2	UJ	2.1	UJ	2.1	UJ	2.2	UJ
Pentachlorophenol	3.1	U	3.1	U	3.2	U	3.2	U	3.4	U
Phenanthrene	1.6	U	1.6	U	1.6	U	1.6	U	1.7	U
Phenol	1.8	UJ	1.8	UJ	1.8	UJ	1.8	UJ	1.9	UJ
Pyrene	1.7	U	1.7	U	1.8	U	1.8	U	1.8	U
Pesticide/PCB Analysis (UG/L)										
4,4'-DDD	0.0070	U	0.0070	U	0.0070	U	0.00714	U	0.00707	U
4,4'-DDE	0.0030	U	0.0030	U	0.0030	U	0.00306	U	0.00303	U
4,4'-DDT	0.0020	U	0.0020	U	0.0020	U	0.00204	U	0.00202	U
Aldrin	0.0020	U	0.0020	U	0.0020	U	0.00204	U	0.00202	U
alpha-BHC	0.0020	UJ	0.0020	UJ	0.0020	UJ	0.00204	UJ	0.00202	UJ
alpha-Chlordane	0.0010	U	0.0010	U	0.0010	U	0.00102	U	0.00101	U
Aroclor-1016	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U
Aroclor-1016/1242	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U

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APPENDIX F1
ANALYTICAL RESULTS - GROUNDWATER
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-A-MW01B-01		DA-A-MW-DUP08-01		DA-A-MW02B-01		DA-A-MW03B-01		DA-A-MW04B-01	
Sample Location	MW01B		MW01B		MW02B		MW03B		MW04B	
Date Sampled	9/4/2003		9/4/2003		9/3/2003		9/5/2003		9/4/2003	
QC Identifier	Field Dup. DA-A-MW01B-01		Field Dup. DA-A-MW01B-01		None		None		None	
Aroclor-1221	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U
Aroclor-1232	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U
Aroclor-1242	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U
Aroclor-1248	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U
Aroclor-1254	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U
Aroclor-1260	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U
Aroclor-1268	0.057	U	0.057	U	0.057	U	0.057	U	0.057	U
beta-BHC	0.0080	U	0.0080	U	0.0080	U	0.00816	U	0.00808	U
delta-BHC	0.0020	U	0.0020	U	0.0020	U	0.00204	U	0.00202	U
Dieldrin	0.0030	U	0.0030	U	0.0030	U	0.00306	U	0.00303	U
Endosulfan I	0.0010	U	0.0010	U	0.0010	U	0.00102	U	0.00101	U
Endosulfan II	0.0070	U	0.0070	U	0.0070	U	0.00714	U	0.00707	U
Endosulfan Sulfate	0.0030	U	0.0030	U	0.0030	UJ	0.00306	U	0.00303	U
Endrin	0.0030	U	0.0030	U	0.0030	U	0.00306	U	0.00303	U
Endrin Aldehyde	0.0040	UJ	0.0040	UJ	0.0040	UJ	0.00408	UJ	0.00404	UJ
Endrin Ketone	0.0030	U	0.0030	U	0.0030	U	0.00306	U	0.00303	U
gamma-BHC	0.0020	U	0.0020	U	0.0020	U	0.00204	U	0.00202	U
gamma-Chlordane	0.0020	U	0.0020	U	0.0020	U	0.00204	U	0.00202	U
Heptachlor	0.0010	UJ	0.0010	UJ	0.0010	UJ	0.00102	UJ	0.00101	UJ
Heptachlor Epoxide	0.0020	U	0.0020	U	0.0020	U	0.00204	U	0.00202	U
Hexachlorobenzene	0.20	UR	0.20	UR	0.20	UR	0.204	UR	0.202	UR
Methoxychlor	0.016	U	0.016	U	0.016	U	0.0163	U	0.0162	U
Toxaphene	0.043	U	0.043	U	0.043	U	0.0439	U	0.0434	U
TAL Metal Analysis (UG/L)										
Aluminum	97.0		57.0		29.0	J	29.0	J	21.0	J
Antimony	2.04	U	8.33	U	2.0	U	2.0	U	2.0	U
Arsenic	3.4	U	3.4	U	26.1		3.4	U	3.4	U
Barium	12.0		9.9		30.0		9.1		1.2	U
Beryllium	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U
Cadmium	10.2		7.9		0.40	U	0.40	U	0.40	U
Calcium	28000		23000		16000		22000		41000	
Chromium	2.8	U	2.1	U	2.4	U	0.80	U	0.80	U
Cobalt	1.9	U	0.62	U	9.6		1.8	U	0.64	U
Copper	1.9	J	1.8	U	1.8	U	1.8	U	1.8	U
Iron	120		120		27000		14.0	U	14.0	U
Lead	4.8	U	5.88	J	4.8	U	4.8	U	4.8	U
Magnesium	7800		5900		2600		7800		11000	

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APPENDIX F1
ANALYTICAL RESULTS - GROUNDWATER
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-A-MW01B-01		DA-A-MW-DUP08-01		DA-A-MW02B-01		DA-A-MW03B-01		DA-A-MW04B-01	
Sample Location	MW01B		MW01B		MW02B		MW03B		MW04B	
Date Sampled	9/4/2003		9/4/2003		9/3/2003		9/5/2003		9/4/2003	
QC Identifier	Field Dup. DA-A-MW01B-01		Field Dup. DA-A-MW01B-01		None		None		None	
Manganese	110		110		8400		81.0		1200	
Mercury	0.26		0.24		0.012	U	0.012	U	0.012	U
Molybdenum	1.3	U	1.3	U	2.1	U	1.3	U	1.3	J
Nickel	1.8	U	1.8	U	1.82	J	1.8	U	1.8	U
Potassium	1600		1500		2300		2300		680	U
Selenium	2.56	J	2.5	U	2.5	U	2.5	U	2.5	U
Silver	1.33	U	0.70	U	1.15	U	0.84	U	0.70	U
Sodium	10000		9600		6100		15000		12000	
Thallium	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U
Vanadium	1.4	U	0.80	U	0.80	U	0.80	U	0.80	U
Zinc	4.0	J	2.5	J	8.1		3.3	J	3.3	J
Dissolved Metal Analysis (UG/L)										
Aluminum	17.0	U	22.0	J	24.0	J	17.0	U	20.0	J
Antimony	2.0	U	3.63	U	2.0	U	2.0	U	2.0	U
Arsenic	3.4	U	3.4	U	7.87	U	3.4	U	3.4	U
Barium	160	J	630	J	23.0		9.0	J	1.0	U
Beryllium	0.60	U	0.60	U	0.60	U	0.60	U	0.60	U
Cadmium	9.55		7.45		0.40	U	0.40	U	0.40	U
Calcium	29000		29000		15000		22000		42000	
Chromium	1.3	U	1.4	U	2.0	U	0.80	U	0.80	U
Cobalt	0.96	U	1.5	U	8.6		1.5	U	0.72	U
Copper	1.8	U	2.3	J	1.8	U	1.8	U	1.8	U
Iron	14.0	U	14.0	U	14000		14.0	U	14.0	U
Lead	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U
Magnesium	7900		7900		2400		7700		12000	
Manganese	150		160		8100		78.0		1200	
Mercury	0.18		0.16		0.012	U	0.012	U	0.012	U
Molybdenum	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Nickel	1.93	J	1.8	U	1.8	U	1.8	U	1.8	U
Potassium	1700		1300		2200		2300		960	U
Selenium	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Silver	0.70	U	0.70	U	1.42	U	0.70	U	0.70	U
Sodium	11000	J	16000	J	5900		15000	J	13000	J
Thallium	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U
Vanadium	0.80	U	0.80	U	0.80	U	0.80	U	0.80	U
Zinc	33.0	J	260	J	7.0		2.2	U	3.3	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

F2

SEDIMENT

APPENDIX F2
ANALYTICAL RESULTS - SEDIMENT
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SD01-01		DA-S-SD02-01		DA-S-SD-DUP01-01		DA-S-SD03-01		DA-S-SD04-01		DA-S-SD05-01		DA-S-SD06-01		DA-S-SD07-01		DA-S-SD08-01	
Sample Location	SD01		SD02		SD02		SD03		SD04		SD05		SD06		SD07		SD08	
Date Sampled	7/31/2003		7/30/2003		7/30/2003		7/30/2003		7/31/2003		7/30/2003		7/29/2003		7/29/2003		7/29/2003	
Interval	0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5	
QC Identifier	None		Field Dup. DA-S-SD02-01		Field Dup. DA-S-SD02-01		None		None		None		None		None		None	
Volatile Organic Analysis (UG/KG)																		
1,1,1,2-Tetrachloroethane	0.31	U	0.19	U	0.15	U	0.18	U	0.18	U	0.21	U	0.26	U	0.53	U	0.51	UJ
1,1,1-Trichloroethane	0.64	U	2.3		0.95		0.37	U	0.36	U	1.2		1.3		1.1	U	1	UJ
1,1,2,2-Tetrachloroethane	0.42	U	0.26	U	0.2	U	0.24	UJ	0.24	U	0.28	U	0.34	U	0.7	U	0.67	UJ
1,1,2-Trichloroethane	0.45	U	0.28	U	0.22	U	0.26	U	0.26	U	0.31	U	0.37	U	0.77	U	0.74	UJ
1,1-Dichloroethane	0.67	U	0.71	J	0.32	U	0.39	U	0.38	U	0.46	U	0.55	U	1.1	U	1.1	UJ
1,1-Dichloroethene	0.82	U	0.51	U	0.4	U	0.48	U	0.47	U	0.56	U	0.68	U	1.4	U	1.3	UJ
1,1-Dichloropropene	0.55	U	0.34	U	0.26	U	0.32	U	0.31	U	0.37	U	0.45	U	0.93	U	0.89	UJ
1,2,3-Trichlorobenzene	0.37	U	0.22	U	0.18	U	0.21	UJ	0.21	U	0.25	U	0.3	U	0.62	UJ	0.59	UJ
1,2,3-Trichloropropane	0.45	U	0.28	U	0.22	U	0.26	UJ	0.26	U	0.31	U	0.37	U	0.77	U	0.74	UJ
1,2,4-Trichlorobenzene	4.6	U	0.32	U	0.25	U	0.3	UJ	2.3	U	0.35	U	0.43	U	0.88	UJ	0.84	UJ
1,2,4-Trimethylbenzene	0.51	U	0.31	U	0.25	U	0.3	UJ	0.29	U	0.35	U	0.42	U	0.86	U	0.83	UJ
1,2-Dibromo-3-chloropropane	0.76	U	0.47	U	0.37	U	0.44	UJ	0.43	U	0.52	U	0.63	U	1.3	U	1.2	UJ
1,2-Dibromoethane	0.14	U	0.086	U	0.067	U	0.081	U	0.079	U	0.095	U	0.11	U	0.24	U	0.22	UJ
1,2-Dichlorobenzene	0.43	U	0.26	U	0.21	U	0.25	UJ	0.24	U	0.29	U	0.35	U	0.73	U	0.69	UJ
1,2-Dichloroethane	0.38	U	0.23	U	0.18	U	0.22	U	0.21	U	0.26	U	0.31	U	0.64	U	0.62	UJ
1,2-Dichloropropane	0.37	U	0.22	U	0.18	U	0.21	U	0.21	U	0.25	U	0.3	U	0.62	U	0.59	UJ
1,3,5-Trimethylbenzene	0.43	U	0.26	U	0.21	U	0.25	UJ	0.24	U	0.29	U	0.35	U	0.73	U	0.7	UJ
1,3-Dichlorobenzene	0.38	U	0.23	U	0.18	U	0.22	UJ	0.21	U	0.26	U	0.31	U	0.64	U	0.61	UJ
1,3-Dichloropropane	0.56	U	0.34	U	0.27	U	0.33	U	0.32	U	0.38	U	0.46	U	0.95	U	0.91	UJ
1,4-Dichlorobenzene	0.31	U	0.19	U	0.15	U	0.18	UJ	0.18	U	0.21	U	0.26	U	0.53	U	0.51	UJ
2,2-Dichloropropane	0.65	U	0.4	U	0.32	U	0.38	U	0.37	U	0.44	U	0.54	U	1.1	U	1.1	UJ
2-Butanone	27	J	0.4	U	0.31	U	0.38	U	0.36	U	0.44	U	0.53	U	69	J	11	J
2-Chlorotoluene	0.58	U	0.35	U	0.28	U	0.34	UJ	0.32	U	0.39	U	0.47	U	0.98	U	0.93	UJ
2-Hexanone	0.5	U	0.31	U	0.24	U	0.29	U	0.28	U	0.34	U	0.41	U	0.85	U	0.82	UJ
4-Chlorotoluene	0.58	U	0.36	U	0.28	U	0.34	UJ	0.33	U	0.4	U	0.48	U	0.99	U	0.95	UJ
4-Methyl-2-Pentanone	0.85	U	0.52	U	0.41	U	0.5	U	0.48	U	0.58	U	0.7	U	1.4	U	1.4	UJ
Acetone	70	J	6.6	U	5.2	U	6.2	U	6	U	7.3	U	8.8	U	180	J	34	J
Benzene	0.46	U	0.28	U	0.22	U	0.27	U	0.26	U	0.31	U	0.38	U	0.78	U	0.74	UJ
Bromobenzene	0.59	U	0.36	U	0.28	U	0.34	UJ	0.33	U	0.4	U	0.48	U	1	U	0.95	UJ
Bromochloromethane	0.39	U	0.24	U	0.19	U	0.23	U	0.22	U	0.27	U	0.32	U	0.66	U	0.64	UJ
Bromodichloromethane	0.57	U	0.35	U	0.28	U	0.33	U	0.32	U	0.39	U	0.47	U	0.96	U	0.92	UJ
Bromoform	0.41	U	0.25	U	0.2	U	0.24	UJ	0.23	U	0.28	U	0.34	U	0.69	U	0.66	UJ
Bromomethane	2.4	U	1.5	U	1.1	U	1.4	U	1.3	U	1.6	U	1.9	U	4	U	3.8	UJ
Carbon Disulfide	0.69	U	0.42	U	0.33	U	0.4	U	0.39	U	0.47	U	0.57	U	1.2	U	1.1	UJ
Carbon Tetrachloride	0.76	U	0.47	U	0.37	U	0.45	U	0.43	U	0.52	U	0.63	U	1.3	U	1.2	UJ

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F2
ANALYTICAL RESULTS - SEDIMENT
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SD01-01		DA-S-SD02-01		DA-S-SD-DUP01-01		DA-S-SD03-01		DA-S-SD04-01		DA-S-SD05-01		DA-S-SD06-01		DA-S-SD07-01		DA-S-SD08-01	
Sample Location	SD01		SD02		SD02		SD03		SD04		SD05		SD06		SD07		SD08	
Date Sampled	7/31/2003		7/30/2003		7/30/2003		7/30/2003		7/31/2003		7/30/2003		7/29/2003		7/29/2003		7/29/2003	
Interval	0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5	
QC Identifier	None		Field Dup. DA-S-SD02-01		Field Dup. DA-S-SD02-01		None		None		None		None		None		None	
Chlorobenzene	0.48	U	0.3	U	0.23	U	0.28	U	0.27	U	0.33	U	0.4	U	0.81	U	0.78	UJ
Chloroethane	1.6	J	0.29	U	0.23	U	0.28	U	0.27	U	0.32	U	0.39	U	0.8	U	0.77	UJ
Chloroform	0.55	U	0.34	U	0.27	U	0.32	U	0.31	U	0.38	U	0.45	U	0.94	U	0.9	UJ
Chloromethane	0.84	U	0.52	U	0.41	U	0.49	U	0.48	U	0.57	U	0.69	U	1.4	U	1.4	UJ
cis-1,2-Dichloroethene	0.62	U	0.38	U	0.3	U	0.36	U	0.35	U	0.42	U	0.51	U	1	U	1	UJ
cis-1,3-Dichloropropene	0.36	U	0.22	U	0.17	U	0.21	U	0.2	U	0.24	U	0.29	U	0.6	U	0.58	UJ
Dibromochloromethane	0.4	U	0.25	U	0.19	U	0.23	U	0.23	U	0.27	U	0.33	U	0.68	U	0.65	UJ
Dibromomethane	0.73	U	0.45	U	0.35	U	0.43	U	0.41	U	0.5	U	0.6	U	1.2	U	1.2	UJ
Dichlorodifluoromethane	66	J	25	J	2.4	J	7.7	J	0.42	U	5.4	J	0.61	U	1.2	U	14	J
Ethylbenzene	0.56	U	0.35	U	0.27	U	0.33	U	0.32	U	0.38	U	0.46	U	0.95	U	0.91	UJ
Hexachlorobutadiene	0.5	U	0.31	U	0.24	U	0.29	UJ	0.28	U	0.34	U	0.41	U	0.85	U	0.81	UJ
Isopropylbenzene	0.62	U	0.38	U	0.3	U	0.36	UJ	0.35	U	0.42	U	0.51	U	1	U	1	UJ
m&p-Xylene	2.2	J	0.74	U	0.58	U	0.7	U	0.68	U	0.82	U	0.99	U	2	U	1.9	UJ
Methyl tert-Butyl Ether	0.62	U	0.38	U	0.3	U	0.36	U	0.35	U	0.42	U	0.51	U	1	U	1	UJ
Methylene Chloride	11	U	7	U	5.4	U	6.6	U	6.4	U	7.7	U	9.3	U	19	U	18	UJ
Naphthalene	8.1	U	5	U	3.9	U	4.7	UJ	4.6	U	5.5	U	6.7	U	14	UJ	13	UJ
n-Butylbenzene	0.61	U	0.38	U	0.3	U	0.36	UJ	0.35	U	0.42	U	0.5	U	1	U	0.99	UJ
n-Propylbenzene	0.56	U	0.34	U	0.27	U	0.32	UJ	0.31	U	0.38	U	0.46	U	0.94	U	0.9	UJ
o-Xylene	0.97	U	0.6	U	0.47	U	0.56	U	0.55	U	0.66	U	0.8	U	1.6	U	1.6	UJ
p-Isopropyltoluene	0.53	U	0.33	U	0.26	U	0.31	U	0.79	J	0.36	U	0.44	U	0.9	U	0.86	UJ
sec-Butylbenzene	0.54	U	0.33	U	0.26	U	0.32	UJ	0.3	U	0.37	U	0.44	U	0.91	U	0.88	UJ
Styrene	1	U	0.62	U	0.48	U	0.58	U	0.57	U	0.68	U	0.82	U	1.7	U	1.6	UJ
tert-Butylbenzene	0.56	U	0.34	U	0.27	U	0.33	UJ	0.32	U	0.38	U	0.46	U	0.95	U	0.91	UJ
Tetrachloroethene	0.54	U	0.33	U	0.26	U	0.32	U	0.3	U	0.37	U	15		0.91	U	0.88	UJ
Toluene	0.47	U	0.29	U	0.23	U	0.28	U	0.27	U	0.32	U	0.39	U	38	J	0.77	UJ
trans-1,2-Dichloroethene	0.51	U	0.32	U	0.25	U	0.3	U	0.29	U	0.35	U	0.42	U	0.87	U	0.83	UJ
trans-1,3-Dichloropropene	0.31	U	0.19	U	0.15	U	0.18	U	0.18	U	0.21	U	0.26	U	0.53	U	0.5	UJ
Trichloroethene	0.59	U	0.37	U	0.29	U	0.35	U	0.34	U	0.4	U	14		1	U	0.96	UJ
Trichlorofluoromethane	0.66	U	0.4	U	0.32	U	0.38	U	0.37	U	0.45	U	0.54	U	1.1	U	1.1	UJ
Vinyl Chloride	0.9	U	0.55	U	0.43	U	0.52	U	0.51	U	0.61	U	0.74	U	1.5	U	1.4	UJ
Semivolatile Organic Analysis (UG/KG)																		
1,2,4-Trichlorobenzene	120	U	92	U	92	U	92	U	87	U	92	U	100	UJ	150	U	220	UJ
1,2-Dichlorobenzene	120	U	89	U	89	U	89	U	84	U	89	U	100	UJ	150	UJ	210	UJ
1,2-Diphenylhydrazine	110	U	82	U	82	U	82	U	78	U	82	U	93	UJ	140	U	190	UJ
1,3-Dichlorobenzene	120	U	92	U	92	U	92	U	87	U	92	U	100	UJ	150	UJ	220	UJ

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F2
ANALYTICAL RESULTS - SEDIMENT
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SD01-01		DA-S-SD02-01		DA-S-SD-DUP01-01		DA-S-SD03-01		DA-S-SD04-01		DA-S-SD05-01		DA-S-SD06-01		DA-S-SD07-01		DA-S-SD08-01	
Sample Location	SD01		SD02		SD02		SD03		SD04		SD05		SD06		SD07		SD08	
Date Sampled	7/31/2003		7/30/2003		7/30/2003		7/30/2003		7/31/2003		7/30/2003		7/29/2003		7/29/2003		7/29/2003	
Interval	0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5	
QC Identifier	None		Field Dup. DA-S-SD02-01		Field Dup. DA-S-SD02-01		None		None		None		None		None		None	
1,4-Dichlorobenzene	130	U	99	U	99	U	99	U	94	U	99	U	110	UJ	160	U	230	UJ
2,2'-oxybis(1-Chloropropane)	100	U	78	U	78	U	78	U	74	U	78	U	89	UJ	130	U	180	UJ
2,4,5-Trichlorophenol	220	U	160	U	160	U	160	U	150	U	160	U	180	UJ	270	U	380	UJ
2,4,6-Trichlorophenol	360	U	270	U	270	U	270	U	260	U	270	U	310	UJ	450	U	640	UJ
2,4-Dichlorophenol	250	U	190	U	190	U	190	U	180	U	190	U	220	UJ	320	U	450	UJ
2,4-Dimethylphenol	890	U	670	U	670	U	670	U	630	U	670	U	760	UJ	1100	U	1600	UJ
2,4-Dinitrophenol	240	U	180	U	180	U	180	U	170	U	180	U	210	UJ	300	U	430	UJ
2,4-Dinitrotoluene	120	U	88	U	88	U	88	U	83	U	88	U	100	UJ	150	U	210	UJ
2,6-Dichlorophenol	220	U	160	U	160	U	160	U	160	U	160	U	190	UJ	270	U	390	UJ
2,6-Dinitrotoluene	140	U	100	U	100	U	100	U	97	U	100	U	120	UJ	170	U	240	UJ
2-Chloronaphthalene	110	U	84	U	84	U	84	U	79	U	84	U	95	UJ	140	U	200	UJ
2-Chlorophenol	230	U	170	U	170	U	170	U	160	U	170	U	190	UJ	280	U	400	UJ
2-Methylnaphthalene	370	U	280	U	280	U	280	U	260	U	280	U	310	UJ	460	U	650	UJ
2-Methylphenol	290	U	220	U	220	U	220	U	200	U	220	U	240	UJ	360	U	510	UJ
2-Nitroaniline	250	U	190	U	190	U	190	U	180	U	190	U	210	UJ	310	U	440	UJ
2-Nitrophenol	280	U	210	U	210	U	210	U	200	U	210	U	240	UJ	350	U	490	UJ
3,3'-Dichlorobenzidine	180	U	130	U	130	U	130	U	120	U	130	U	150	UJ	220	UJ	310	UJ
3+4-Methylphenols	310	U	240	U	240	U	240	U	220	U	240	U	270	UJ	390	U	550	UJ
3-Methylphenol	1200	U	880	U	880	U	880	U	830	U	880	U	0.00	J	1500	U	2100	U
3-Nitroaniline	180	U	130	U	130	U	130	U	120	U	130	U	150	UJ	220	U	310	UJ
4,6-Dinitro-2-methylphenol	200	U	150	U	150	U	150	U	140	U	150	U	170	UJ	250	U	350	UJ
4-Bromophenyl-phenylether	84	U	63	U	63	U	63	U	60	U	63	U	72	UJ	100	U	150	UJ
4-Chloro-3-methylphenol	320	U	240	U	240	U	240	U	230	U	240	U	280	UJ	400	U	570	UJ
4-Chloroaniline	370	U	280	U	280	U	280	U	260	U	280	U	320	UJ	460	U	650	UJ
4-Chlorophenyl-phenylether	120	U	91	U	91	U	91	U	86	U	91	U	100	UJ	150	U	210	UJ
4-Nitroaniline	330	U	240	U	240	U	240	U	230	U	240	U	280	UJ	410	U	580	UJ
4-Nitrophenol	400	U	300	U	300	U	300	U	290	U	300	U	340	UJ	500	U	710	UJ
Acenaphthene	110	U	85	U	85	U	780		80	U	85	U	52	UJ	140	U	200	UJ
Acenaphthylene	150	U	110	U	110	U	110	U	100	U	110	U	130	UJ	180	U	260	UJ
Anthracene	87	J	56	U	56	U	2000		53	U	56	U	140	UJ	220	J	140	J
Benzidine	6700	UJ	5000	UJ	5000	UJ	5000	UJ	4800	UJ	5000	UJ	5700	UJ	8300	UJ	12000	UJ
Benzo(a)anthracene	320	J	140	J	100	U	3400		96	U	100	U	430	UJ	790	J	680	J
Benzo(a)pyrene	310	J	100	U	100	U	2600		99	U	100	U	360	UJ	810	J	930	J
Benzo(b)fluoranthene	310	J	130	U	130	U	2300		120	U	130	U	320	UJ	1000	J	1200	J
Benzo(g,h,i)perylene	420	J	150	U	150	U	1900		140	U	150	U	270	UJ	760	J	940	J
Benzo(k)fluoranthene	300	J	100	J	98	U	2300		93	U	100	J	310	UJ	790	J	1000	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F2
ANALYTICAL RESULTS - SEDIMENT
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SD01-01		DA-S-SD02-01		DA-S-SD-DUP01-01		DA-S-SD03-01		DA-S-SD04-01		DA-S-SD05-01		DA-S-SD06-01		DA-S-SD07-01		DA-S-SD08-01	
Sample Location	SD01		SD02		SD02		SD03		SD04		SD05		SD06		SD07		SD08	
Date Sampled	7/31/2003		7/30/2003		7/30/2003		7/30/2003		7/31/2003		7/30/2003		7/29/2003		7/29/2003		7/29/2003	
Interval	0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5	
QC Identifier	None		Field Dup. DA-S-SD02-01		Field Dup. DA-S-SD02-01		None		None		None		None		None		None	
Benzoic acid	1500	J	300	U	1100	J	1100	J	980	J	1200	J	1200	UJ	1900	J	2700	J
Benzyl Alcohol	400	J	240	U	240	U	240	U	230	U	240	U	280	UJ	400	U	570	UJ
Bis(2-Chloroethoxy)methane	140	U	100	U	100	U	100	U	97	U	100	U	120	UJ	170	U	240	UJ
Bis(2-Chloroethyl)ether	120	U	94	U	94	U	94	U	89	U	94	U	110	UJ	160	U	220	UJ
bis(2-Ethylhexyl)phthalate	980	U	580	J	560	J	680	J	560	U	570	J	700	UJ	1200	J	2300	J
Butylbenzylphthalate	180	U	130	U	130	U	130	U	130	U	130	U	150	UJ	220	U	320	UJ
Carbazole	130	U	98	U	98	U	1300		92	U	98	U	110	UJ	160	U	230	UJ
Chrysene	380	J	140	J	100	U	3300		98	U	140	J	420	UJ	1100	J	1400	J
Dibenzo(a,h)anthracene	240	U	180	U	180	U	640	J	170	U	180	U	210	UJ	300	U	430	UJ
Dibenzofuran	200	U	150	U	150	U	550	J	140	U	150	U	23	UJ	260	U	360	UJ
Diethylphthalate	120	U	88	U	88	U	420	J	83	U	88	U	530	UJ	1000	J	1600	J
Dimethylphthalate	120	U	86	U	86	U	86	U	82	U	86	U	98	UJ	140	U	200	UJ
Di-n-Butylphthalate	130	U	98	U	98	U	100	J	93	U	98	U	110	UJ	160	U	230	UJ
Di-n-octylphthalate	240	U	180	U	180	U	180	U	170	U	180	U	200	UJ	290	U	410	UJ
Fluoranthene	710	J	280	J	140	J	8500		80	U	200	J	920	J	2100		2500	J
Fluorene	110	U	84	U	84	U	1000		80	U	84	U	60	UJ	140	U	200	UJ
Hexachlorobenzene	93	U	70	U	70	U	70	U	66	U	70	U	79	UJ	120	U	160	UJ
Hexachlorobutadiene	170	U	130	U	130	U	130	U	120	U	130	U	150	UJ	210	U	300	UJ
Hexachloroethane	140	U	100	U	100	U	100	U	96	U	100	U	120	UJ	170	U	240	UJ
Indeno(1,2,3-cd)pyrene	270	U	200	U	200	U	1700		190	U	200	U	220	UJ	640	J	800	J
Isophorone	140	U	100	U	100	U	100	U	97	U	100	U	120	UJ	170	U	240	UJ
Naphthalene	140	U	110	U	110	U	140	J	100	U	110	U	120	UJ	180	U	250	UJ
Nitrobenzene	180	U	130	U	130	U	130	U	120	U	130	U	150	UJ	220	U	310	UJ
N-nitrosodimethylamine	120	U	88	U	88	U	88	U	84	U	88	U	100	UJ	150	U	210	UJ
N-Nitroso-di-n-propylamine	120	U	87	U	87	U	87	U	82	U	87	U	99	UJ	140	U	200	UJ
N-Nitroso-diphenylamine	170	U	120	U	120	U	120	U	120	U	120	U	140	UJ	210	U	290	UJ
N-nitrosopyrrolidine	2600	U	1900	U	1900	U	1900	U	1800	U	1900	U	2200	UJ	3200	U	4500	UJ
Pentachlorophenol	680	U	510	U	510	U	510	U	480	U	510	U	580	UJ	840	U	1200	UJ
Phenanthrene	390	J	120	J	84	J	8000		80	U	84	U	550	UJ	990	J	910	J
Phenol	180	U	140	U	140	U	140	U	130	U	140	U	160	UJ	230	U	320	UJ
Pyrene	660	J	250	J	120	J	7000		87	U	170	J	820	UJ	1700		2000	UJ
Pesticide/PCB Analysis (UG/KG)																		
4,4'-DDD	22.2	U	16.7	U	16.7	U	41.7	U	15.7	U	16.7	U	47.2	U	69.1	U	97.7	UJ
4,4'-DDE	10.4	U	7.84	U	13.4	J	19.6	U	7.41	U	18.6	U	22.2	U	77.2	U	46	UJ
4,4'-DDT	20.9	U	15.7	U	15.7	U	39.2	U	14.8	U	15.7	U	44.4	U	65	U	92	UJ
Aldrin	6.54	U	4.9	U	4.9	U	12.2	U	4.63	U	4.9	U	13.9	U	20.3	U	28.7	UJ

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F2
ANALYTICAL RESULTS - SEDIMENT
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SD01-01		DA-S-SD02-01		DA-S-SD-DUP01-01		DA-S-SD03-01		DA-S-SD04-01		DA-S-SD05-01		DA-S-SD06-01		DA-S-SD07-01		DA-S-SD08-01	
Sample Location	SD01		SD02		SD02		SD03		SD04		SD05		SD06		SD07		SD08	
Date Sampled	7/31/2003		7/30/2003		7/30/2003		7/30/2003		7/31/2003		7/30/2003		7/29/2003		7/29/2003		7/29/2003	
Interval	0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5	
QC Identifier	None		Field Dup. DA-S-SD02-01		Field Dup. DA-S-SD02-01		None		None		None		None		None		None	
alpha-BHC	6.54	U	4.9	U	4.9	U	12.2	U	4.63	U	4.9	U	13.9	U	20.3	U	28.7	UJ
alpha-Chlordane	7.84	U	5.88	U	5.88	U	14.7	U	19.1	J	5.88	U	16.7	U	24.4	U	34.5	UJ
Aroclor-1016	63.7	U	47.8	U	47.8	U	47.8	U	45.1	U	47.8	U	54.2	U	396	U	112	UJ
Aroclor-1016/1242	163	U	122	U	122	U	122	U	116	U	122	U	139	U	1020	U	287	U
Aroclor-1221	63.7	U	47.8	U	47.8	U	47.8	U	45.1	U	47.8	U	54.2	U	396	U	112	UJ
Aroclor-1232	63.7	U	47.8	U	47.8	U	47.8	U	45.1	U	47.8	U	54.2	U	396	U	112	UJ
Aroclor-1242	63.7	U	47.8	U	47.8	U	47.8	U	45.1	U	47.8	U	54.2	U	396	U	112	UJ
Aroclor-1248	63.7	U	47.8	U	47.8	U	47.8	U	45.1	U	47.8	U	54.2	U	396	U	112	UJ
Aroclor-1254	63.7	U	47.8	U	47.8	U	47.8	U	45.1	U	47.8	U	54.2	U	396	U	112	UJ
Aroclor-1260	35.9	U	27	U	27	U	100	J	25.5	U	27	U	197		450	J	63.2	UJ
Aroclor-1268	63.7	U	47.8	U	47.8	U	64.4	J	45.1	U	47.8	U	54.2	U	2480		112	UJ
beta-BHC	17	U	12.7	U	12.7	U	31.9	U	12	U	12.7	U	36.1	U	52.8	U	74.7	UJ
delta-BHC	6.54	U	4.9	U	4.9	U	12.2	U	4.63	U	4.9	U	13.9	U	20.3	U	28.7	UJ
Dieldrin	9.15	U	6.86	U	14.6	J	17.2	U	6.48	U	14.4	J	19.4	U	61.3	J	40.2	UJ
Endosulfan I	6.54	U	4.9	U	4.9	U	12.2	U	4.63	U	4.9	U	13.9	U	20.3	U	28.7	UJ
Endosulfan II	22.2	U	16.7	U	16.7	U	41.7	U	15.7	U	16.7	U	47.2	U	69.1	U	97.7	UJ
Endosulfan Sulfate	14.4	U	10.8	U	10.8	U	27	U	10.2	U	10.8	U	30.6	U	44.7	U	63.2	UJ
Endrin	10.4	U	7.84	U	7.84	U	19.6	U	7.41	U	7.84	U	22.2	U	32.5	U	46	UJ
Endrin Aldehyde	17	U	12.7	U	12.7	U	31.9	U	12	U	12.7	U	36.1	U	52.8	U	74.7	UJ
Endrin Ketone	11.8	U	8.82	U	8.82	U	22	U	8.33	U	8.82	U	25	U	36.6	U	51.7	UJ
gamma-BHC	6.54	U	4.9	U	4.9	U	12.2	U	4.63	U	4.9	U	13.9	U	20.3	U	28.7	UJ
gamma-Chlordane	6.54	U	4.9	U	4.9	U	12.2	U	4.63	U	4.9	U	13.9	U	20.3	U	28.7	UJ
Heptachlor	7.84	U	5.88	U	5.88	U	14.7	U	5.56	U	5.88	U	16.7	U	24.4	U	34.5	UJ
Heptachlor Epoxide	6.54	U	4.9	U	4.9	U	12.2	U	4.63	U	4.9	U	13.9	U	20.3	U	28.7	UJ
Hexachlorobenzene	261	U	196	U	196	U	490	U	185	U	196	U	556	U	813	U	1150	UJ
Methoxychlor	60.1	U	45.1	U	45.1	U	113	U	42.6	U	45.1	U	128	U	187	U	264	UJ
Toxaphene	528	U	396	U	396	U	990	U	374	U	396	U	1120	U	1640	U	2320	UJ
TAL Metal Analysis (MG/KG)																		
Aluminum	10000		6000		6000		7300		5000		7000		7700		11000		18000	J
Antimony	0.43	U	0.48	U	0.23	U	1.1	U	0.26	U	0.49	U	1.0	U	0.66	U	1.2	U
Arsenic	18.0		11.0		11.0		16.0		12.0		16.0		17.0		18.0		23.0	J
Barium	41.0		17.0		18.0		39.0		17.0		22.0		47.0		67.0		77.0	J
Beryllium	0.46		0.30		0.31		0.34		0.35		0.35		0.39		0.45		0.71	J
Cadmium	0.98	J	0.43	J	0.46	J	1.2	J	0.17	J	0.48	J	2.4	J	1.3	J	1.2	J
Calcium	1600		1100		1100		1800		710		1500		2000		2700		2400	J
Chromium	13.0		7.4		7.4		12.0		6.5		9.1		13.0		14.0		22.0	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F2
ANALYTICAL RESULTS - SEDIMENT
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SD01-01		DA-S-SD02-01		DA-S-SD-DUP01-01		DA-S-SD03-01		DA-S-SD04-01		DA-S-SD05-01		DA-S-SD06-01		DA-S-SD07-01		DA-S-SD08-01	
Sample Location	SD01		SD02		SD02		SD03		SD04		SD05		SD06		SD07		SD08	
Date Sampled	7/31/2003		7/30/2003		7/30/2003		7/30/2003		7/31/2003		7/30/2003		7/29/2003		7/29/2003		7/29/2003	
Interval	0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5	
QC Identifier	None		Field Dup. DA-S-SD02-01		Field Dup. DA-S-SD02-01		None		None		None		None		None		None	
Cobalt	12.0		170		180		160		8.1		38.0		140		73.0		35.0	J
Copper	33.0		27.0		28.0		40.0		9.1		21.0		52.0		43.0		58.0	J
Iron	19000		14000		14000		21000		14000		17000		19000		25000		40000	J
Lead	76.0		590		630		700		14.0		130		770		350		180	J
Magnesium	2100		1200		1200		1700		1000		1600		1400		1900		3000	J
Manganese	220		600		590		1700		200		730		1000		2800		580	J
Mercury	0.143	J	0.083		0.12		0.088		0.0639	J	0.097		0.18		0.22		0.33	J
Molybdenum	5.9		3.2		3.2		6.4		0.21	U	3.1		3.4		6.4		3.7	J
Nickel	19.0		16.0		16.0		25.0		11.0		14.0		18.0		20.0		27.0	J
Potassium	200		150		150		250		83.0	U	150		210		260		610	J
Selenium	0.097	U	0.073	U	0.073	U	0.14	U	0.069	U	0.073	U	0.17	U	0.12	U	0.17	UJ
Silver	0.24	J	1.9	J	2.1	J	4.8	J	0.16	J	0.78	J	2.8	J	1.4	J	0.69	J
Sodium	130	U	70.0	U	71.0	U	53.0	U	26.0	U	68.0	U	90.0	U	110	U	180	U
Thallium	1.4	UJ	1.0	UJ	1.0	UJ	2.0	UJ	0.97	UJ	1.0	UJ	2.3	UJ	1.7	UJ	2.4	UJ
Vanadium	25.0		12.0		12.0		18.0		13.0		15.0		23.0		24.0		38.0	J
Zinc	140		64.0		64.0		130		36.0		77.0		140		180		200	J
Acid Volatile Sulfides/Simultaneously Extracted Metals Analysis (UMO/G)																		
Acid Volatile Sulfide	2.120		0.07300	UR	0.07300	UR	0.07300	UR	0.06900	U	0.07300	UR	0.08300	UR	0.9730	J	3.0700	J
Antimony	0.02700	U	0.02900	U	0.02900	U	0.02900	U	0.004000	U	0.02900	U	0.03300	U	0.04800	U	0.06900	UJ
Bismuth	0.1390	U	0.1470	U	0.1470	U	0.1470	U	0.003800	U	0.1470	U	0.1670	U	0.2440	U	0.3450	UJ
Cadmium	0.005000	U	0.005000	U	0.005000	U	0.005000	U	0.0001000	U	0.005000	U	0.01200		0.009000	U	0.01300	UJ
Chromium	0.06900		0.04800		0.04100		0.09100		0.03000		0.05800		0.1040		0.1120		0.1330	J
Copper	0.2940		0.2970		0.2840		0.3370		0.07500		0.1880		0.4640		0.4480		0.4590	J
Lead	0.3290		3.0300		3.0300		2.650		0.06500		0.7260		3.480		1.690		0.7330	J
Mercury	0.008200		0.006100	U	0.006100	U	0.006100	U	0.005800		0.006100	U	0.007000	U	0.01020	U	0.01440	UJ
Nickel	0.1140		0.1270		0.09600		0.1380		0.05400		0.08700		0.1390		0.1740		0.1450	J
Zinc	1.590		0.5810		0.5320		1.340		0.2460		0.8750		1.340		2.150		2.0400	J
Miscellaneous Analysis (%)																		
Percent Clay	7.0		6.1		6.4		3.9		2.5		3.0		2.5		5.2		11.0	J
PERCENT COARSE SILT	17.0		19.0		27.0		7.8		14.0		11.0		24.0		21.0		9.6	J
PERCENT FINE SILT	13.0		8.9		9.2		7.4		4.8		6.6		6.2		13.0		23.0	J
PERCENT MEDIUM SILT	20.0		21.0		19.0		14.0		10.0		16.0		18.0		25.0		38.0	J
Percent Sand	43.0		45.0		38.0		67.0		68.0		63.0		50.0		35.0		19.0	J
SIEVE NO. 004	0.40		0.10	U	1.3		17.0		36.0		23.0		0.60		0.10	U	0.10	UJ

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F2
ANALYTICAL RESULTS - SEDIMENT
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SD01-01		DA-S-SD02-01		DA-S-SD-DUP01-01		DA-S-SD03-01		DA-S-SD04-01		DA-S-SD05-01		DA-S-SD06-01		DA-S-SD07-01		DA-S-SD08-01	
Sample Location	SD01		SD02		SD02		SD03		SD04		SD05		SD06		SD07		SD08	
Date Sampled	7/31/2003		7/30/2003		7/30/2003		7/30/2003		7/31/2003		7/30/2003		7/29/2003		7/29/2003		7/29/2003	
Interval	0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5		0.0-0.5	
QC Identifier	None		Field Dup. DA-S-SD02-01		Field Dup. DA-S-SD02-01		None		None		None		None		None		None	
SIEVE NO. 010	0.40		0.10	U	1.3		18.0		40.0		27.0		0.60		0.10	U	0.10	UJ
SIEVE NO. 040	5.1		2.5		2.3		33.0		48.0		38.0		2.8		0.70		0.10	UJ
SIEVE NO. 100	30.0		25.0		22.0		58.0		56.0		52.0		23.0		13.0		0.30	J
Total Organic Carbon	3.65		1.14		1.09		1.82		1.34		1.86		2.52		3.9		5.76	J
TOTAL SOLIDS	51.0		68.0		68.0		68.0		72.0		68.0		60.0		41.0		29.0	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

Sample Number	DA-S-SD09-01	
Sample Location	SD09	
Date Sampled	7/29/2003	
Interval	0.0-0.5	
QC Identifier	None	
Volatile Organic Analysis (UG/KG)		
1,1,1,2-Tetrachloroethane	0.46	U
1,1,1-Trichloroethane	0.94	U
1,1,2,2-Tetrachloroethane	0.61	UJ
1,1,2-Trichloroethane	0.67	U
1,1-Dichloroethane	0.99	U
1,1-Dichloroethene	1.2	U
1,1-Dichloropropene	0.81	U
1,2,3-Trichlorobenzene	0.54	UJ
1,2,3-Trichloropropane	0.67	UJ
1,2,4-Trichlorobenzene	6.2	J
1,2,4-Trimethylbenzene	0.75	UJ
1,2-Dibromo-3-chloropropane	1.1	UJ
1,2-Dibromoethane	0.2	U
1,2-Dichlorobenzene	0.63	UJ
1,2-Dichloroethane	0.56	U
1,2-Dichloropropane	0.54	U
1,3,5-Trimethylbenzene	0.63	UJ
1,3-Dichlorobenzene	0.55	UJ
1,3-Dichloropropane	0.82	U
1,4-Dichlorobenzene	0.46	UJ
2,2-Dichloropropane	0.96	U
2-Butanone	28	J
2-Chlorotoluene	0.85	UJ
2-Hexanone	0.74	U
4-Chlorotoluene	0.86	UJ
4-Methyl-2-Pentanone	1.2	U
Acetone	90	J
Benzene	0.67	U
Bromobenzene	0.86	UJ
Bromochloromethane	0.58	U
Bromodichloromethane	0.84	U
Bromoform	0.6	UJ
Bromomethane	3.5	U
Carbon Disulfide	2.7	J
Carbon Tetrachloride	1.1	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

Sample Number	DA-S-SD09-01	
Sample Location	SD09	
Date Sampled	7/29/2003	
Interval	0.0-0.5	
QC Identifier	None	
Chlorobenzene	0.71	U
Chloroethane	0.7	U
Chloroform	0.81	U
Chloromethane	1.2	U
cis-1,2-Dichloroethene	0.91	U
cis-1,3-Dichloropropene	0.52	U
Dibromochloromethane	0.59	U
Dibromomethane	1.1	U
Dichlorodifluoromethane	28	J
Ethylbenzene	0.83	U
Hexachlorobutadiene	0.74	UJ
Isopropylbenzene	0.91	UJ
m&p-Xylene	1.8	U
Methyl tert-Butyl Ether	0.91	U
Methylene Chloride	16	U
Naphthalene	12	UJ
n-Butylbenzene	0.9	UJ
n-Propylbenzene	0.82	UJ
o-Xylene	1.4	U
p-Isopropyltoluene	0.78	U
sec-Butylbenzene	0.79	UJ
Styrene	1.5	U
tert-Butylbenzene	0.82	UJ
Tetrachloroethene	0.79	U
Toluene	0.7	U
trans-1,2-Dichloroethene	0.75	U
trans-1,3-Dichloropropene	0.46	U
Trichloroethene	0.88	U
Trichlorofluoromethane	0.97	U
Vinyl Chloride	1.3	U
Semivolatile Organic Analysis (UG/KG)		
1,2,4-Trichlorobenzene	200	U
1,2-Dichlorobenzene	190	U
1,2-Diphenylhydrazine	170	U
1,3-Dichlorobenzene	200	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

Sample Number	DA-S-SD09-01	
Sample Location	SD09	
Date Sampled	7/29/2003	
Interval	0.0-0.5	
QC Identifier	None	
1,4-Dichlorobenzene	210	U
2,2'-oxybis(1-Chloropropane)	170	U
2,4,5-Trichlorophenol	350	U
2,4,6-Trichlorophenol	580	U
2,4-Dichlorophenol	410	U
2,4-Dimethylphenol	1400	U
2,4-Dinitrophenol	390	U
2,4-Dinitrotoluene	190	U
2,6-Dichlorophenol	350	U
2,6-Dinitrotoluene	220	U
2-Chloronaphthalene	180	U
2-Chlorophenol	360	U
2-Methylnaphthalene	590	U
2-Methylphenol	460	U
2-Nitroaniline	400	U
2-Nitrophenol	450	U
3,3'-Dichlorobenzidine	280	U
3+4-Methylphenols	500	U
3-Methylphenol	1900	U
3-Nitroaniline	280	U
4,6-Dinitro-2-methylphenol	320	U
4-Bromophenyl-phenylether	130	U
4-Chloro-3-methylphenol	520	U
4-Chloroaniline	590	U
4-Chlorophenyl-phenylether	190	U
4-Nitroaniline	520	U
4-Nitrophenol	650	U
Acenaphthene	180	U
Acenaphthylene	240	U
Anthracene	120	U
Benzidine	11000	UJ
Benzo(a)anthracene	590	J
Benzo(a)pyrene	830	J
Benzo(b)fluoranthene	1100	J
Benzo(g,h,i)perylene	830	J
Benzo(k)fluoranthene	870	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F2
ANALYTICAL RESULTS - SEDIMENT
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SD09-01	
Sample Location	SD09	
Date Sampled	7/29/2003	
Interval	0.0-0.5	
QC Identifier	None	
Benzoic acid	2400	J
Benzyl Alcohol	520	U
Bis(2-Chloroethoxy)methane	220	U
Bis(2-Chloroethyl)ether	200	U
bis(2-Ethylhexyl)phthalate	2300	J
Butylbenzylphthalate	290	U
Carbazole	210	U
Chrysene	1200	J
Dibenzo(a,h)anthracene	390	U
Dibenzofuran	330	U
Diethylphthalate	2000	
Dimethylphthalate	180	U
Di-n-Butylphthalate	210	U
Di-n-octylphthalate	380	U
Fluoranthene	2300	
Fluorene	180	U
Hexachlorobenzene	150	U
Hexachlorobutadiene	280	U
Hexachloroethane	220	U
Indeno(1,2,3-cd)pyrene	680	J
Isophorone	220	U
Naphthalene	230	U
Nitrobenzene	280	U
N-nitrosodimethylamine	190	U
N-Nitroso-di-n-propylamine	180	U
N-Nitroso-diphenylamine	270	U
N-nitrosopyrrolidine	4100	U
Pentachlorophenol	1100	U
Phenanthrene	740	J
Phenol	290	U
Pyrene	1900	
Pesticide/PCB Analysis (UG/KG)		
4,4'-DDD	88.5	U
4,4'-DDE	99	U
4,4'-DDT	83.3	U
Aldrin	26	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

Sample Number	DA-S-SD09-01	
Sample Location	SD09	
Date Sampled	7/29/2003	
Interval	0.0-0.5	
QC Identifier	None	
alpha-BHC	26	U
alpha-Chlordane	31.2	U
Aroclor-1016	102	U
Aroclor-1016/1242	260	U
Aroclor-1221	102	U
Aroclor-1232	102	U
Aroclor-1242	102	U
Aroclor-1248	102	U
Aroclor-1254	102	U
Aroclor-1260	57.3	U
Aroclor-1268	102	U
beta-BHC	67.7	U
delta-BHC	26	U
Dieldrin	36.4	U
Endosulfan I	26	U
Endosulfan II	88.5	U
Endosulfan Sulfate	57.3	U
Endrin	41.7	U
Endrin Aldehyde	67.7	U
Endrin Ketone	46.9	U
gamma-BHC	26	U
gamma-Chlordane	26	U
Heptachlor	31.2	U
Heptachlor Epoxide	26	U
Hexachlorobenzene	1040	U
Methoxychlor	240	U
Toxaphene	2100	U
TAL Metal Analysis (MG/KG)		
Aluminum	20000	
Antimony	1.0	U
Arsenic	25.0	
Barium	82.0	
Beryllium	0.75	
Cadmium	0.97	J
Calcium	2400	
Chromium	23.0	

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

Sample Number	DA-S-SD09-01	
Sample Location	SD09	
Date Sampled	7/29/2003	
Interval	0.0-0.5	
QC Identifier	None	
Cobalt	36.0	
Copper	56.0	
Iron	37000	
Lead	150	
Magnesium	3200	
Manganese	600	
Mercury	0.32	
Molybdenum	8.8	
Nickel	28.0	
Potassium	690	
Selenium	0.16	U
Silver	0.53	J
Sodium	160	U
Thallium	2.2	UJ
Vanadium	40.0	
Zinc	180	
Acid Volatile Sulfides/Simultaneously Extracted Metals Analysis (UMO/G)		
Acid Volatile Sulfide	23.90	J
Antimony	0.06200	U
Bismuth	0.3120	U
Cadmium	0.01200	U
Chromium	0.1820	
Copper	0.5210	
Lead	0.7510	
Mercury	0.01310	U
Nickel	0.1880	
Zinc	2.140	
Miscellaneous Analysis (%)		
Percent Clay	14.0	
PERCENT COARSE SILT	5.7	
PERCENT FINE SILT	27.0	
PERCENT MEDIUM SILT	38.0	
Percent Sand	15.0	
SIEVE NO. 004	0.10	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F2
ANALYTICAL RESULTS - SEDIMENT
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SD09-01	
Sample Location	SD09	
Date Sampled	7/29/2003	
Interval	0.0-0.5	
QC Identifier	None	
SIEVE NO. 010	0.10	U
SIEVE NO. 040	0.10	U
SIEVE NO. 100	0.40	
Total Organic Carbon	4.46	
TOTAL SOLIDS	32.0	

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

F3

SOIL

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-MW04B-0810-01		DA-S-MW04B-1416-01		DA-S-SB01 0102-01		DA-S-SB01 5575-01		DA-S-SB01 0809-01		DA-S-SB02 0102-01		DA-S-SB02 0304-01		DA-S-SB02 5565-01		DA-S-SB03 0102-01		DA-S-SB03 0304-01
Sample Location	MW04B		MW04B		SB01		SB01		SB01		SB02		SB02		SB02		SB03		SB03
Date Sampled	8/28/2003		8/28/2003		8/19/2003		8/19/2003		8/19/2003		8/18/2003		8/18/2003		8/18/2003		8/19/2003		8/19/2003
Interval	8.0-10.0		14.0-16.0		1.0-2.0		5.5-7.5		8.0-9.0		1.0-2.0		3.0-4.0		5.5-6.5		1.0-2.0		3.0-4.0
QC Identifier	None		None		None		None		None		None		None		None		None		None
Volatile Organic Analysis (UG/KG)																			
1,1,1,2-Tetrachloroethane	0.16	U	0.15	U	0.89	U	0.8	U	0.68	U	0.2	U	0.17	U	0.16	U	120	U	0.76
1,1,1-Trichloroethane	0.33	U	0.31	U	0.89	U	0.8	U	0.68	U	0.41	U	0.34	U	0.32	U	120	U	0.76
1,1,2,2-Tetrachloroethane	0.21	U	0.2	U	0.89	U	0.8	U	0.68	U	0.27	U	0.22	U	0.21	U	120	U	0.76
1,1,2-Trichloroethane	0.23	U	0.22	U	1.3	U	1.2	U	1	U	0.29	U	0.24	U	0.23	U	180	U	1.1
1,1-Dichloroethane	0.35	U	0.32	U	1.3	U	1.2	U	1	U	0.44	U	0.36	U	0.34	U	180	U	1.1
1,1-Dichloroethene	0.42	U	0.4	U	0.89	U	0.8	U	0.68	U	0.53	U	0.44	U	0.41	U	120	U	0.76
1,1-Dichloropropene	0.28	U	0.26	U	4.4	U	4	U	3.4	U	0.36	U	0.29	U	0.28	U	590	U	3.8
1,2,3-Trichlorobenzene	0.19	U	0.18	U	4.4	U	4	U	3.4	U	0.24	U	0.2	U	0.18	U	590	U	3.8
1,2,3-Trichloropropane	0.23	U	0.22	U	8.9	U	8	U	6.8	U	0.29	U	0.24	U	0.23	U	1200	U	7.6
1,2,4-Trichlorobenzene	0.27	U	0.25	U	4.4	U	4	U	3.4	U	0.34	U	0.28	U	0.26	U	590	U	3.8
1,2,4-Trimethylbenzene	0.99	U	0.25	U	4.4	U	4	U	3.4	U	0.33	U	0.27	U	0.26	U	590	U	3.8
1,2-Dibromo-3-chloropropane	0.39	U	0.37	U	4.4	U	4	U	3.4	U	0.49	U	0.41	U	0.38	U	590	U	3.8
1,2-Dibromoethane	0.071	U	0.067	U	4.4	U	4	U	3.4	U	0.09	U	0.074	U	0.07	U	590	U	3.8
1,2-Dichlorobenzene	0.22	U	0.21	U	4.4	U	4	U	3.4	U	0.28	U	0.23	U	0.22	U	590	U	3.8
1,2-Dichloroethane	0.19	U	0.18	U	0.89	U	0.8	U	0.68	U	0.24	U	0.2	U	0.19	U	120	U	0.76
1,2-Dichloropropane	0.19	U	0.18	U	3.1	U	2.8	U	2.4	U	0.24	U	0.2	U	0.18	U	420	U	2.7
1,3,5-Trimethylbenzene	0.22	U	0.21	U	4.4	U	4	U	3.4	U	0.28	U	0.23	U	0.22	U	590	U	3.8
1,3-Dichlorobenzene	0.19	U	0.18	U	4.4	U	4	U	3.4	U	0.24	U	0.2	U	0.19	U	590	U	3.8
1,3-Dichloropropane	0.29	U	0.27	U	4.4	U	4	U	3.4	U	0.36	U	0.3	U	0.28	U	590	U	3.8
1,4-Dichlorobenzene	0.16	U	0.15	U	4.4	U	4	U	3.4	U	0.2	U	0.17	U	0.16	U	590	U	3.8
2,2-Dichloropropane	0.34	U	0.32	U	4.4	U	4	U	3.4	U	0.42	U	0.35	U	0.33	U	590	U	3.8
2-Butanone	0.33	U	0.31	U	23		8	U	6.8	U	16		0.34	U	0.32	U	1200	U	7.9
2-Chlorotoluene	0.3	U	0.28	U	4.4	U	4	U	3.4	U	0.37	U	0.31	U	0.29	U	590	U	3.8
2-Hexanone	0.26	U	0.24	U	8.9	U	8	U	6.8	U	0.32	U	0.27	U	0.25	U	1200	U	7.6
4-Chlorotoluene	0.3	U	0.28	U	4.4	U	4	U	3.4	U	0.38	U	0.31	U	0.29	U	590	U	3.8
4-Methyl-2-Pentanone	0.44	U	0.41	U	8.9	U	8	U	6.8	U	0.55	U	0.46	U	0.43	U	1200	U	7.6
Acetone	5.5	U	5.2	U	94	J	8	U	22	J	46		9.2		58		1200	U	35
Benzene	0.24	U	0.22	U	0.89	U	0.8	U	0.68	U	0.3	U	0.24	U	0.23	U	120	U	0.76
Bromobenzene	0.3	U	0.28	U	4.4	U	4	U	3.4	U	0.38	U	0.31	U	0.3	U	590	U	3.8
Bromochloromethane	0.2	U	0.19	U	4.4	U	4	U	3.4	U	0.25	U	0.21	U	0.2	U	590	U	3.8
Bromodichloromethane	0.29	U	0.27	U	0.89	U	0.8	U	0.68	U	0.37	U	0.3	U	0.28	U	120	U	0.76
Bromoform	0.21	U	0.2	U	3.6	U	3.2	U	2.7	U	0.26	U	0.22	U	0.2	U	470	U	3
Bromomethane	1.2	U	1.1	U	1.8	U	1.6	U	1.4	U	1.5	U	1.3	U	1.2	U	240	U	1.5
Carbon Disulfide	0.35	U	0.33	U	0.95	J	8	U	1	J	0.44	U	0.37	U	0.35	U	1200	U	7.6
Carbon Tetrachloride	0.39	U	0.37	U	0.89	U	0.8	U	0.68	U	0.49	U	0.41	U	0.38	U	120	U	0.76

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

Sample Number	DA-S-MW04B-0810-01		DA-S-MW04B-1416-01		DA-S-SB01 0102-01		DA-S-SB01 5575-01		DA-S-SB01 0809-01		DA-S-SB02 0102-01		DA-S-SB02 0304-01		DA-S-SB02 5565-01		DA-S-SB03 0102-01		DA-S-SB03 0304-01
Sample Location	MW04B		MW04B		SB01		SB01		SB01		SB02		SB02		SB02		SB03		SB03
Date Sampled	8/28/2003		8/28/2003		8/19/2003		8/19/2003		8/19/2003		8/18/2003		8/18/2003		8/18/2003		8/19/2003		8/19/2003
Interval	8.0-10.0		14.0-16.0		1.0-2.0		5.5-7.5		8.0-9.0		1.0-2.0		3.0-4.0		5.5-6.5		1.0-2.0		3.0-4.0
QC Identifier	None		None		None		None		None		None		None		None		None		None
Chlorobenzene	0.25	U	0.23	U	0.89	U	0.8	U	0.68	U	0.31	U	0.26	U	0.24	U	120	U	0.76
Chloroethane	0.24	U	0.23	U	1.8	U	1.6	U	1.4	U	0.31	U	0.25	U	0.24	U	240	U	1.5
Chloroform	0.28	U	0.27	U	0.76	J	1.2	U	1	U	0.36	U	0.3	U	0.28	U	180	U	1.1
Chloromethane	0.43	U	0.41	U	4.4	U	4	U	3.4	U	0.54	U	0.45	U	0.42	U	590	U	3.8
cis-1,2-Dichloroethene	0.32	U	1.3		0.89	U	0.8	U	0.68	U	0.4	U	0.33	U	0.31	U	120	U	0.76
cis-1,3-Dichloropropene	0.18	U	0.17	U	0.89	U	0.8	U	0.68	U	0.23	U	0.19	U	0.18	U	120	U	0.76
Dibromochloromethane	0.21	U	0.19	U	0.89	U	0.8	U	0.68	U	0.26	U	0.22	U	0.2	U	120	U	0.76
Dibromomethane	0.38	U	0.35	U	8.9	U	8	U	6.8	U	0.47	U	0.39	U	0.37	U	1200	U	7.6
Dichlorodifluoromethane	0.38	UJ	0.36	UJ	8.9	U	8	U	6.8	U	0.48	U	0.4	U	0.37	U	1200	U	7.6
Ethylbenzene	0.29	U	0.27	U	0.89	U	0.8	U	0.68	U	0.36	U	0.3	U	0.28	U	120	U	0.76
Hexachlorobutadiene	0.26	U	0.24	U	4.4	U	4	U	3.4	U	0.32	U	0.27	U	0.25	U	590	U	3.8
Isopropylbenzene	0.32	U	0.3	U	0.89	U	0.8	U	0.68	U	0.4	U	0.33	U	0.31	U	120	U	0.76
m&p-Xylene	0.62	U	0.58	U	0.89	U	0.8	U	0.61	J	0.78	U	0.64	U	1.8		120	U	0.76
Methyl tert-Butyl Ether	0.32	U	0.3	U	1.8	U	1.6	U	1.4	U	0.4	U	0.33	U	0.31	U	240	U	1.5
Methylene Chloride	5.8	U	5.4	U	8.9	U	8	U	6.8	U	7.3	U	6	U	5.7	U	1200	U	7.6
Naphthalene	4.2	U	3.9	U	4.4	U	4	U	3.4	U	5.2	U	4.3	U	4.1	U	590	U	3.8
n-Butylbenzene	0.31	U	0.3	U	0.89	U	0.8	U	0.68	U	0.4	U	0.33	U	0.31	U	190		0.76
n-Propylbenzene	0.28	U	0.27	U	0.89	U	0.8	U	0.68	U	0.36	U	0.3	U	0.28	U	120	U	0.76
o-Xylene	0.5	U	0.47	U	0.89	U	0.8	U	0.68	U	0.62	U	0.52	U	0.71	J	120	U	0.76
p-Isopropyltoluene	0.27	U	0.26	U	0.89	U	0.8	U	0.68	U	0.34	U	0.28	U	2.5		290		1
sec-Butylbenzene	0.28	U	0.26	U	0.97		1.1	J	5.2		0.35	U	0.29	U	0.27	U	120	U	1.8
Styrene	0.51	U	0.48	U	0.89	U	0.8	U	0.68	U	0.65	U	0.53	U	0.5	U	120	U	0.76
tert-Butylbenzene	0.29	U	0.27	U	1.1	J	4	U	0.54	J	0.36	U	0.3	U	0.28	U	590	U	1.2
Tetrachloroethene	0.28	U	3.7		0.89	U	0.8	U	0.68	U	2.4		0.29	U	0.64	J	120	U	0.76
Toluene	0.24	U	0.23	U	1.3	U	1.2	U	1	U	0.31	U	0.25	U	0.24	U	180	U	1.1
trans-1,2-Dichloroethene	0.26	U	0.25	U	1.3	U	1.2	U	1	U	0.33	U	0.27	U	0.26	U	180	U	1.1
trans-1,3-Dichloropropene	0.16	U	0.15	U	0.89	U	0.8	U	0.68	U	0.2	U	0.17	U	0.16	U	120	U	0.76
Trichloroethene	0.3	U	3.3		0.89	U	0.8	U	0.68	U	0.38	U	0.32	U	0.3	U	120	U	0.76
Trichlorofluoromethane	0.34	U	0.32	U	4.4	U	4	U	1.4	U	0.42	U	0.35	U	0.33	U	590	U	3.8
Vinyl Chloride	0.46	U	0.43	U	1.8	U	1.6	U	1.4	U	0.58	U	0.48	U	0.45	U	240	U	1.5
Semivolatile Organic Analysis (UG/KG)																			
1,2,4-Trichlorobenzene	150	U	71	U	570	U	570	UJ	620	U	76	U	71	U	72	U	560	U	620
1,2-Dichlorobenzene	140	U	69	UJ	570	U	570	UJ	620	U	73	U	69	U	70	U	560	U	620
1,2-Diphenylhydrazine	130	U	64	U	570	U	570	UJ	620	U	67	U	64	U	64	U	560	U	620
1,3-Dichlorobenzene	150	U	71	U	570	U	570	UJ	620	U	76	U	71	U	72	U	560	U	620

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-MW04B-0810-01		DA-S-MW04B-1416-01		DA-S-SB01 0102-01		DA-S-SB01 5575-01		DA-S-SB01 0809-01		DA-S-SB02 0102-01		DA-S-SB02 0304-01		DA-S-SB02 5565-01		DA-S-SB03 0102-01		DA-S-SB03 0304-01
Sample Location	MW04B		MW04B		SB01		SB01		SB01		SB02		SB02		SB02		SB03		SB03
Date Sampled	8/28/2003		8/28/2003		8/19/2003		8/19/2003		8/19/2003		8/18/2003		8/18/2003		8/18/2003		8/19/2003		8/19/2003
Interval	8.0-10.0		14.0-16.0		1.0-2.0		5.5-7.5		8.0-9.0		1.0-2.0		3.0-4.0		5.5-6.5		1.0-2.0		3.0-4.0
QC Identifier	None		None		None		None		None		None		None		None		None		None
1,4-Dichlorobenzene	160	U	76	U	570	U	570	UJ	620	U	81	U	76	U	77	U	560	U	620
2,2'-oxybis(1-Chloropropane)	120	U	60	U	570	U	570	UJ	620	U	64	U	60	U	61	U	560	U	620
2,4,5-Trichlorophenol	260	U	130	U	570	U	570	UJ	620	U	130	U	130	U	130	UJ	560	U	620
2,4,6-Trichlorophenol	440	U	210	U	570	U	570	UJ	620	U	220	U	210	U	210	UJ	560	U	620
2,4-Dichlorophenol	300	U	150	U	1100	U	1100	UJ	1200	U	160	U	150	U	150	UJ	1100	U	1200
2,4-Dimethylphenol	1100	U	520	UR	1100	U	1100	UJ	1200	U	550	U	520	U	520	UJ	1100	U	1200
2,4-Dinitrophenol	290	U	140	U	2300	U	2300	UJ	2500	U	150	U	140	U	140	UJ	2200	U	2500
2,4-Dinitrotoluene	140	U	68	U	680	U	680	UJ	740	U	72	U	68	U	69	U	670	U	740
2,6-Dichlorophenol	260	U	130	U	1100	U	1100	UJ	1200	U	130	U	130	U	130	UJ	1100	U	1200
2,6-Dinitrotoluene	160	U	79	U	570	U	570	UJ	620	U	84	U	79	U	80	U	560	U	620
2-Chloronaphthalene	130	U	64	U	680	U	680	UJ	740	U	68	U	64	U	65	U	670	U	740
2-Chlorophenol	270	U	130	UJ	680	U	680	UJ	740	U	140	U	130	U	130	UJ	670	U	740
2-Methylnaphthalene	440	U	210	U	910	U	910	UJ	990	U	230	U	210	U	220	U	280	J	990
2-Methylphenol	340	U	170	UR	680	U	680	UJ	740	U	180	U	170	U	170	UJ	670	U	740
2-Nitroaniline	300	U	140	U	570	U	570	UJ	620	U	150	U	140	U	150	U	560	U	620
2-Nitrophenol	340	U	160	U	2300	U	2300	UJ	2500	U	170	U	160	U	160	UJ	2200	U	2500
3,3'-Dichlorobenzidine	210	U	100	UJ	5700	UJ	5700	UJ	6200	UJ	110	U	100	UJ	100	U	5600	UJ	6200
3+4-Methylphenols	380	U	180	UJ	680	U	680	UJ	740	U	190	U	180	U	180	UJ	670	U	740
3-Methylphenol	1400	U	680	U	680	U	680	U	740	U	720	U	680	U	690	U	670	U	740
3-Nitroaniline	210	U	100	U	570	U	570	UJ	620	U	110	U	100	U	100	U	560	U	620
4,6-Dinitro-2-methylphenol	240	U	120	U	2300	U	2300	UJ	2500	U	120	U	120	U	120	UJ	2200	U	2500
4-Bromophenyl-phenylether	100	U	49	U	570	U	570	UJ	620	U	52	U	49	U	49	U	560	U	620
4-Chloro-3-methylphenol	390	U	190	U	570	U	570	UJ	620	U	200	U	190	U	190	UJ	560	U	620
4-Chloroaniline	440	U	210	UJ	570	UJ	570	UJ	620	UJ	230	U	210	UJ	220	U	560	UJ	620
4-Chlorophenyl-phenylether	140	U	70	U	570	U	570	UJ	620	U	74	U	70	U	71	U	560	U	620
4-Nitroaniline	390	U	190	U	800	U	800	UJ	860	U	200	U	190	U	190	U	790	U	860
4-Nitrophenol	490	U	240	U	1100	U	1100	UJ	1200	U	250	U	240	U	240	UJ	1100	U	1200
Acenaphthene	440	J	94	J	570	U	570	UJ	620	U	70	U	66	U	67	U	560	U	620
Acenaphthylene	180	U	86	U	570	U	570	UJ	620	U	92	U	86	U	87	U	560	U	620
Anthracene	970	J	260	J	570	U	570	UJ	620	U	46	U	43	U	44	U	560	U	620
Benzidine	8000	UJ	3900	UJ	5700	UJ	5700	UJ	6200	UJ	4100	UJ	3900	UJ	3900	UJ	5600	UJ	6200
Benzo(a)anthracene	2300		610		240	J	570	UJ	620	U	83	U	78	U	79	U	560	U	620
Benzo(a)pyrene	1900		400	J	160	J	570	UJ	620	U	86	U	81	U	82	U	560	U	620
Benzo(b)fluoranthene	1700		410	J	270	J	570	UJ	620	U	110	U	100	U	100	U	560	U	620
Benzo(g,h,i)perylene	1300		290	J	570	U	570	UJ	620	U	120	U	120	U	120	U	560	U	620
Benzo(k)fluoranthene	1600		450	J	290	J	570	UJ	620	U	80	U	76	U	77	U	560	U	620

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
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APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-MW04B-0810-01		DA-S-MW04B-1416-01		DA-S-SB01 0102-01		DA-S-SB01 5575-01		DA-S-SB01 0809-01		DA-S-SB02 0102-01		DA-S-SB02 0304-01		DA-S-SB02 5565-01		DA-S-SB03 0102-01		DA-S-SB03 0304-01
Sample Location	MW04B		MW04B		SB01		SB01		SB01		SB02		SB02		SB02		SB03		SB03
Date Sampled	8/28/2003		8/28/2003		8/19/2003		8/19/2003		8/19/2003		8/18/2003		8/18/2003		8/18/2003		8/19/2003		8/19/2003
Interval	8.0-10.0		14.0-16.0		1.0-2.0		5.5-7.5		8.0-9.0		1.0-2.0		3.0-4.0		5.5-6.5		1.0-2.0		3.0-4.0
QC Identifier	None		None		None		None		None		None		None		None		None		None
Benzoic acid	470	U	230	U	5700	U	5700	UJ	6200	U	240	UJ	230	UJ	230	UJ	5600	U	6200
Benzyl Alcohol	390	UJ	190	U	1100	U	1100	UJ	1200	U	200	UJ	190	U	190	UJ	1100	U	1200
Bis(2-Chloroethoxy)methane	160	U	80	UJ	570	U	570	UJ	620	U	84	U	80	U	80	U	560	U	620
Bis(2-Chloroethyl)ether	150	U	73	U	570	U	570	UJ	620	U	77	U	73	U	74	U	560	U	620
bis(2-Ethylhexyl)phthalate	860	U	510	U	410	J	410	J	1200	U	790	U	410	U	110	U	400	J	450
Butylbenzylphthalate	220	U	100	U	570	U	570	UJ	620	U	110	U	100	U	100	U	560	U	620
Carbazole	760	J	140	J	570	U	570	UJ	620	U	80	U	76	U	76	U	560	U	620
Chrysene	2200		600		550	J	570	UJ	620	U	85	U	80	U	81	U	560	U	620
Dibenzo(a,h)anthracene	380	J	140	U	570	U	570	UJ	620	U	150	U	140	U	140	U	560	U	620
Dibenzofuran	340	J	120	U	570	U	570	UJ	620	U	130	U	120	U	120	U	560	U	620
Diethylphthalate	140	U	97	U	570	U	570	UJ	620	U	72	U	250	U	69	U	560	U	620
Dimethylphthalate	140	U	67	U	570	U	570	UJ	620	U	71	U	67	U	68	U	560	U	620
Di-n-Butylphthalate	160	U	120	J	570	U	570	UJ	620	U	81	U	76	U	77	U	560	U	620
Di-n-octylphthalate	280	U	140	U	570	U	570	UJ	620	U	140	U	140	U	140	U	560	U	620
Fluoranthene	5000		1500		1600		570	UJ	620	U	140	J	65	U	66	U	560	U	620
Fluorene	520	J	140	J	570	U	570	UJ	620	U	69	U	65	U	66	U	560	U	620
Hexachlorobenzene	110	U	54	U	570	U	570	UJ	620	U	57	U	54	U	54	U	560	U	620
Hexachlorobutadiene	210	U	100	U	1100	U	1100	UJ	1200	U	110	U	100	U	100	U	1100	U	1200
Hexachloroethane	160	U	79	U	570	U	570	UJ	620	U	84	U	79	U	80	U	560	U	620
Indeno(1,2,3-cd)pyrene	1200	J	260	J	800	U	800	UJ	860	U	160	U	160	U	160	U	790	U	860
Isophorone	160	U	79	U	570	U	570	UJ	620	U	84	U	79	U	80	U	560	U	620
Naphthalene	180	J	84	U	570	U	570	UJ	620	U	89	U	84	U	84	U	560	U	620
Nitrobenzene	210	U	100	U	570	U	570	UJ	620	U	110	U	100	U	100	U	560	U	620
N-nitrosodimethylamine	140	U	68	U	5700	U	5700	UJ	6200	U	72	U	68	U	69	U	5600	U	6200
N-Nitroso-di-n-propylamine	140	U	68	U	570	U	570	UJ	620	U	72	U	68	U	68	U	560	U	620
N-Nitroso-diphenylamine	200	U	97	U	1700	U	1700	UJ	1800	U	100	U	97	U	98	U	1700	U	1800
N-nitrosopyrrolidine	3100	U	1500	UR	2300	U	2300	UJ	2500	U	1600	U	1500	U	1500	U	2200	U	2500
Pentachlorophenol	810	U	390	U	2300	U	2300	UJ	2500	U	420	U	390	U	400	UJ	2200	U	2500
Phenanthrene	4400		1200		920		570	UJ	620	U	73	J	65	U	66	U	560	U	620
Phenol	220	U	110	UJ	800	U	800	UJ	860	U	110	U	110	U	110	UJ	790	U	860
Pyrene	4200		1200		1200		570	UJ	620	U	120	J	71	U	72	U	560	U	620
Pesticide/PCB Analysis (UG/KG)																			
4,4'-DDD	40	U	19.3	U	4.54	UJ	4.54	UJ	4.94	UJ	20.5	U	1.93	UJ	195	U	8.99	UJ	4.94
4,4'-DDE	18.8	UJ	9.09	UJ	4.54	UJ	4.54	UJ	4.94	UJ	9.64	U	0.909	UJ	92	U	8.99	UJ	4.94
4,4'-DDT	37.6	U	18.2	U	4.54	UJ	4.54	UJ	4.94	UJ	19.3	U	1.82	UJ	184	U	8.99	UJ	4.94
Aldrin	11.8	U	5.68	U	2.27	UJ	2.27	UJ	2.47	UJ	6.02	U	0.568	UJ	57.5	U	4.49	UJ	2.47

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-MW04B-0810-01		DA-S-MW04B-1416-01		DA-S-SB01 0102-01		DA-S-SB01 5575-01		DA-S-SB01 0809-01		DA-S-SB02 0102-01		DA-S-SB02 0304-01		DA-S-SB02 5565-01		DA-S-SB03 0102-01		DA-S-SB03 0304-01
Sample Location	MW04B		MW04B		SB01		SB01		SB01		SB02		SB02		SB02		SB03		SB03
Date Sampled	8/28/2003		8/28/2003		8/19/2003		8/19/2003		8/19/2003		8/18/2003		8/18/2003		8/18/2003		8/19/2003		8/19/2003
Interval	8.0-10.0		14.0-16.0		1.0-2.0		5.5-7.5		8.0-9.0		1.0-2.0		3.0-4.0		5.5-6.5		1.0-2.0		3.0-4.0
QC Identifier	None		None		None		None		None		None		None		None		None		None
alpha-BHC	11.8	UJ	5.68	UJ	2.27	UJ	2.27	UJ	2.47	UJ	6.02	U	0.568	UJ	57.5	U	4.49	UJ	2.47
alpha-Chlordane	14.1	UJ	6.82	UJ	2.27	UJ	2.27	UJ	2.47	UJ	7.23	U	0.682	UJ	69	U	4.49	UJ	2.47
Aroclor-1016	22.9	U	22.2	U	56.8	UJ	56.8	UJ	61.7	UJ	23.5	U	22.2	UJ	22.4	U	56.2	UJ	61.7
Aroclor-1016/1242	58.8	U	56.8	U	56.8	U	56.8	U	61.7	U	60.2	U	56.8	U	57.5	U	56.2	U	61.7
Aroclor-1221	22.9	U	22.2	U	56.8	UJ	56.8	UJ	61.7	UJ	23.5	U	22.2	UJ	22.4	U	56.2	UJ	61.7
Aroclor-1232	22.9	U	22.2	U	56.8	UJ	56.8	UJ	61.7	UJ	23.5	U	22.2	UJ	22.4	U	56.2	UJ	61.7
Aroclor-1242	22.9	U	22.2	U	56.8	UJ	56.8	UJ	61.7	UJ	23.5	U	22.2	UJ	22.4	U	56.2	UJ	61.7
Aroclor-1248	22.9	U	22.2	U	56.8	UJ	56.8	UJ	61.7	UJ	23.5	U	22.2	UJ	22.4	U	56.2	UJ	61.7
Aroclor-1254	22.9	U	22.2	U	56.8	UJ	56.8	UJ	61.7	UJ	23.5	U	22.2	UJ	22.4	U	56.2	UJ	61.7
Aroclor-1260	12.9	U	12.5	U	56.8	UJ	56.8	UJ	61.7	UJ	13.2	U	12.5	UJ	12.6	U	56.2	UJ	61.7
Aroclor-1268	22.9	U	22.2	U	56.8	UJ	56.8	UJ	61.7	UJ	23.5	U	22.2	UJ	22.4	U	56.2	UJ	61.7
beta-BHC	30.6	U	14.8	U	2.27	UJ	2.27	UJ	2.47	UJ	15.7	U	1.48	UJ	149	U	4.49	UJ	2.47
delta-BHC	11.8	U	5.68	U	2.27	UJ	2.27	UJ	2.47	UJ	6.02	U	0.568	UJ	57.5	U	4.49	UJ	2.47
Dieldrin	16.5	U	7.95	U	4.54	UJ	4.54	UJ	4.94	UJ	8.43	U	0.795	UJ	80.4	U	8.99	UJ	4.94
Endosulfan I	11.8	U	5.68	U	2.27	UJ	2.27	UJ	2.47	UJ	6.02	U	0.568	UJ	57.5	U	4.49	UJ	2.47
Endosulfan II	40	U	19.3	U	4.54	UJ	4.54	UJ	4.94	UJ	20.5	U	1.93	UJ	195	U	8.99	UJ	4.94
Endosulfan Sulfate	25.9	U	12.5	U	4.54	UJ	4.54	UJ	4.94	UJ	13.2	U	1.25	UJ	126	U	8.99	UJ	4.94
Endrin	18.8	U	9.09	U	4.54	UJ	4.54	UJ	4.94	UJ	9.64	U	0.909	UJ	92	U	8.99	UJ	4.94
Endrin Aldehyde	30.6	U	14.8	U	4.54	UJ	4.54	UJ	4.94	UJ	15.7	U	1.48	UJ	149	U	8.99	UJ	4.94
Endrin Ketone	21.2	UJ	10.2	UJ	4.54	UJ	4.54	UJ	4.94	UJ	10.8	U	1.02	UJ	103	U	8.99	UJ	4.94
gamma-BHC	11.8	U	5.68	U	2.27	UJ	2.27	UJ	2.47	UJ	6.02	U	0.568	UJ	57.5	U	4.49	UJ	2.47
gamma-Chlordane	11.8	UJ	5.68	UJ	2.27	UJ	2.27	UJ	2.47	UJ	6.02	U	0.568	UJ	57.5	U	4.49	UJ	2.47
Heptachlor	14.1	U	6.82	U	2.27	UJ	2.27	UJ	2.47	UJ	7.23	U	0.682	UJ	69	U	4.49	UJ	2.47
Heptachlor Epoxide	11.8	UJ	5.68	UJ	2.27	UJ	2.27	UJ	2.47	UJ	6.02	U	0.568	UJ	57.5	U	4.49	UJ	2.47
Hexachlorobenzene	470	U	227	U	22.7	UJ	22.7	UJ	24.7	UJ	241	U	22.7	UJ	2300	U	44.9	UJ	24.7
Methoxychlor	108	U	52.3	U	22.7	UJ	22.7	UJ	24.7	UJ	55.4	U	5.23	UJ	529	U	44.9	UJ	24.7
Toxaphene	950	U	459	U	56.8	UJ	56.8	UJ	61.7	UJ	487	U	45.9	J	4640	U	112	UJ	61.7
TAL Metal Analysis (MG/KG)																			
Aluminum	6500		6200		7200		8700		7600		5800		5300		5200		9500		9500
Antimony	0.37		0.26		0.39	U	0.39	U	0.50	U	0.44	U	0.15	U	0.092	U	0.60	U	0.25
Arsenic	16.0	J	21.0	J	31.0		18.0		16.0		21.0	J	11.0	J	7.4	J	32.0		35.0
Barium	21.0		9.4		11.0		8.5		9.0		20.0		19.0		20.0		12.0		100
Beryllium	0.27		0.24		0.40		0.28		0.29		0.41		0.50		0.38		0.40		0.72
Cadmium	0.19		0.018	U	0.018	U	0.018	U	0.020	U	0.14	U	0.018	UJ	0.018	UJ	0.018	U	0.098
Calcium	7500	J	2700	J	790		1100		1000		930		590		810		690		830
Chromium	9.7	J	11.0	J	10.0	J	13.0	J	11.0	J	8.7		6.8		9.4		13.0	J	12.0

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-MW04B-0810-01		DA-S-MW04B-1416-01		DA-S-SB01 0102-01		DA-S-SB01 5575-01		DA-S-SB01 0809-01		DA-S-SB02 0102-01		DA-S-SB02 0304-01		DA-S-SB02 5565-01		DA-S-SB03 0102-01		DA-S-SB03 0304-01
Sample Location	MW04B		MW04B		SB01		SB01		SB01		SB02		SB02		SB02		SB03		SB03
Date Sampled	8/28/2003		8/28/2003		8/19/2003		8/19/2003		8/19/2003		8/18/2003		8/18/2003		8/18/2003		8/19/2003		8/19/2003
Interval	8.0-10.0		14.0-16.0		1.0-2.0		5.5-7.5		8.0-9.0		1.0-2.0		3.0-4.0		5.5-6.5		1.0-2.0		3.0-4.0
QC Identifier	None		None		None		None		None		None		None		None		None		None
Cobalt	9.1	J	17.0	J	15.0		12.0		12.0		8.4		15.0		8.6		16.0		34.0
Copper	17.0	J	22.0	J	26.0		23.0		21.0		14.0		12.0		11.0		26.0		2.1
Iron	15000		18000		30000		30000		26000		20000		16000		13000		29000		67000
Lead	17.0	J	24.0	J	11.0		8.8		7.6		22.0		7.9		9.0		15.0		16.0
Magnesium	1500		2000		2600	J	3100	J	2700	J	920		960		1200		3100	J	1400
Manganese	270		300		410		180		190		400		370		230		340		3300
Mercury	0.0508		0.00806	U	0.00819	U	0.00749	U	0.00893	U	0.0419		0.00817	U	0.00808		0.00821	J	0.0314
Molybdenum	0.53		0.59		0.57		0.53		0.68		0.55	U	0.39	U	0.96		0.39	U	0.064
Nickel	11.0	J	14.0	J	24.0		24.0		23.0		10.0		8.0		10.0		24.0		7.5
Potassium	180		140		130		130		160		92.0	U	140		230		160		250
Selenium	0.12	U	0.11	U	0.11	U	0.11	U	0.12	U	0.24	U	0.11	U	0.11	U	0.11	U	0.12
Silver	0.11	U	0.20		0.046	J	0.032	U	0.034	U	0.82		0.032	U	0.069	U	0.031	U	0.33
Sodium	47.0		28.0	U	30.0	U	31.0	U	30.0	U	42.0	U	33.0	U	36.0	U	28.0	U	57.0
Thallium	0.81	U	0.78	U	0.18	J	0.20	J	0.28	J	0.32	J	0.16	U	0.16	U	0.30	J	0.86
Vanadium	12.0		11.0		16.0		13.0		12.0		17.0		14.0		12.0		13.0		40.0
Zinc	34.0	J	34.0	J	58.0	J	52.0	J	48.0	J	36.0	J	23.0	J	37.0	J	54.0	J	30.0
Total Petroleum Hydrocarbon Analysis (UG/KG)																			
Diesel Range Organics		NA		NA	39000	J	57000	U	62000	U	55000	J	57000	U	37000	J	14000		62000
Gasoline Range Organics	1500	U	860	U	730	J	1300	J	730	J	1300	U	970	U	1100	U	43000		1800
Miscellaneous Analysis (%)																			
TOTAL SOLIDS	85.0		88.0		88.0		88.0		81.0		83.0		88.0		87.0		89.0		81.0

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number		DA-S-SB03 0607-01		DA-S-SB04 0102-01		DA-S-SB04 2535-01		DA-S-SB04-0910-01		DA-S-SB-DUP06-01		DA-S-SB05 0102-01		DA-S-SB05 0203-01		DA-S-SB05 0304-01		DA-S-SB06 0515-01	
Sample Location		SB03		SB04		SB04		SB04		SB04		SB05		SB05		SB05		SB06	
Date Sampled		8/19/2003		8/18/2003		8/18/2003		8/18/2003		8/18/2003		8/19/2003		8/19/2003		8/19/2003		8/18/2003	
Interval		6.0-7.0		1.0-2.0		2.5-3.5		9.0-10.0		9.0-10.0		1.0-2.0		2.0-3.0		3.0-4.0		0.5-1.5	
QC Identifier		None		None		None		Field Dup. DA-S-SB04-0910-01		Field Dup. DA-S-SB04-0910-01		None		None		None		None	
Volatile Organic Analysis (UG/KG)																			
1,1,1,2-Tetrachloroethane	U	0.78	U	0.15	U	640	U	64	U	71	U	0.76	U	0.68	U	0.71	U	0.12	U
1,1,1-Trichloroethane	U	0.78	U	0.31	U	510	U	51	U	57	U	0.76	U	0.68	U	0.71	U	0.24	U
1,1,2,2-Tetrachloroethane	U	0.78	U	0.2	U	610	U	61	U	68	U	0.76	U	0.68	U	0.71	U	0.16	U
1,1,2-Trichloroethane	U	1.2	U	0.22	U	330	U	33	U	37	U	1.1	U	1	U	1.1	U	0.17	U
1,1-Dichloroethane	U	1.2	U	0.32	U	390	U	39	U	44	U	1.1	U	1	U	1.1	U	0.25	U
1,1-Dichloroethene	U	0.78	U	0.4	U	780	U	78	U	87	U	0.76	U	0.68	U	0.71	U	0.31	U
1,1-Dichloropropene	U	3.9	U	0.26	U	700	U	71	U	78	U	3.8	U	3.4	U	3.5	U	0.2	U
1,2,3-Trichlorobenzene	U	3.9	U	0.18	U	790	U	80	U	88	U	3.8	U	3.4	U	3.5	U	0.14	U
1,2,3-Trichloropropane	U	7.8	U	0.22	U	470	U	47	U	52	U	7.6	U	6.8	U	7.1	U	0.17	U
1,2,4-Trichlorobenzene	U	3.9	U	0.25	U	570	U	58	U	64	U	3.8	U	3.4	U	3.5	U	0.19	U
1,2,4-Trimethylbenzene	U	3.9	U	0.24	U	17000		140	U	320	U	3.8	U	3.4	U	3.5	U	0.19	U
1,2-Dibromo-3-chloropropane	U	3.9	U	0.36	U	3300	U	330	U	360	U	3.8	U	3.4	U	3.5	U	0.28	U
1,2-Dibromoethane	U	3.9	U	0.067	U	470	U	47	U	52	U	3.8	U	3.4	U	3.5	U	0.052	U
1,2-Dichlorobenzene	U	3.9	U	0.2	U	320	U	32	U	35	U	3.8	U	3.4	U	3.5	U	0.16	U
1,2-Dichloroethane	U	0.78	U	0.18	U	290	U	29	U	32	U	0.76	U	0.68	U	0.71	U	0.14	U
1,2-Dichloropropane	U	2.7	U	0.18	U	490	U	50	U	55	U	2.6	U	2.4	U	2.5	U	0.14	U
1,3,5-Trimethylbenzene	U	3.9	U	0.21	U	560	U	56	U	120	J	3.8	U	3.4	U	3.5	U	0.16	U
1,3-Dichlorobenzene	U	3.9	U	0.18	U	410	U	41	U	46	U	3.8	U	3.4	U	3.5	U	0.14	U
1,3-Dichloropropane	U	3.9	U	0.27	U	360	U	36	U	40	U	3.8	U	3.4	U	3.5	U	0.21	U
1,4-Dichlorobenzene	U	3.9	U	0.15	U	480	U	48	U	54	U	3.8	U	3.4	U	3.5	U	0.12	U
2,2-Dichloropropane	U	3.9	U	0.31	U	1300	U	130	U	140	U	3.8	U	3.4	U	3.5	U	0.24	U
2-Butanone		5.1	J	1.8	J	3400	U	350	U	380	U	7.6	U	10		13		0.24	U
2-Chlorotoluene	U	3.9	U	0.28	U	490	U	49	U	54	U	3.8	U	3.4	U	3.5	U	0.21	U
2-Hexanone	U	7.8	U	0.24	U	3700	U	380	U	420	U	7.6	U	6.8	U	7.1	U	0.19	U
4-Chlorotoluene	U	3.9	U	0.28	U	500	U	51	U	56	U	3.8	U	3.4	U	3.5	U	0.22	U
4-Methyl-2-Pentanone	U	7.8	U	0.41	U	830	U	83	U	92	U	7.6	U	6.8	U	7.1	U	0.32	U
Acetone	J	91	J	8.5		3100	U	310	U	340	U	7.6	U	33	J	140	J	4	U
Benzene	U	0.78	U	0.22	U	610	U	61	U	68	U	0.76	U	0.68	U	0.71	U	0.17	U
Bromobenzene	U	3.9	U	0.28	U	310	U	31	U	34	U	3.8	U	3.4	U	3.5	U	0.22	U
Bromochloromethane	U	3.9	U	0.19	U	400	U	40	U	44	U	3.8	U	3.4	U	3.5	U	0.15	U
Bromodichloromethane	U	0.78	U	0.27	U	500	U	50	U	55	U	0.76	U	0.68	U	0.71	U	0.21	U
Bromoform	U	3.1	U	0.2	U	2300	U	230	U	250	U	3	U	2.7	U	2.8	U	0.15	U
Bromomethane	U	1.6	U	1.1	U	740	U	74	U	82	U	1.5	U	1.4	U	1.4	U	0.88	U
Carbon Disulfide	U	2.4	J	0.33	U	570	U	57	U	63	U	7.6	U	6.8	U	0.93	J	0.26	U
Carbon Tetrachloride	U	0.78	U	0.37	U	780	U	78	U	87	U	0.76	U	0.68	U	0.71	U	0.28	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number		DA-S-SB03 0607-01		DA-S-SB04 0102-01		DA-S-SB04 2535-01		DA-S-SB04-0910-01		DA-S-SB-DUP06-01		DA-S-SB05 0102-01		DA-S-SB05 0203-01		DA-S-SB05 0304-01		DA-S-SB06 0515-01	
Sample Location		SB03		SB04		SB04		SB04		SB04		SB05		SB05		SB05		SB06	
Date Sampled		8/19/2003		8/18/2003		8/18/2003		8/18/2003		8/18/2003		8/19/2003		8/19/2003		8/19/2003		8/18/2003	
Interval		6.0-7.0		1.0-2.0		2.5-3.5		9.0-10.0		9.0-10.0		1.0-2.0		2.0-3.0		3.0-4.0		0.5-1.5	
QC Identifier		None		None		None		Field Dup. DA-S-SB04-0910-01		Field Dup. DA-S-SB04-0910-01		None		None		None		None	
Chlorobenzene	U	0.78	U	0.23	U	660	U	66	U	73	U	0.76	U	0.68	U	0.71	U	0.18	U
Chloroethane	U	1.6	U	0.23	U	740	U	74	U	83	U	1.5	U	1.4	U	1.4	U	0.18	U
Chloroform	U	1.2	U	0.26	U	280	U	28	U	32	U	1.1	U	1	U	1.1	U	0.21	U
Chloromethane	U	3.9	U	0.4	U	240	U	24	U	27	U	3.8	U	3.4	U	3.5	U	0.32	U
cis-1,2-Dichloroethene	U	0.78	U	0.3	U	380	U	38	U	43	U	0.76	U	0.68	U	0.71	U	0.23	U
cis-1,3-Dichloropropene	U	0.78	U	0.17	U	260	U	26	U	29	U	0.76	U	0.68	U	0.71	U	0.13	U
Dibromochloromethane	U	0.78	U	0.19	U	390	U	39	U	44	U	0.76	U	0.68	U	0.71	U	0.15	U
Dibromomethane	U	7.8	U	0.35	U	400	U	40	U	44	U	7.6	U	6.8	U	7.1	U	0.27	U
Dichlorodifluoromethane	U	7.8	U	0.35	U	620	U	63	U	70	U	7.6	U	6.8	U	7.1	U	0.28	U
Ethylbenzene	U	0.78	U	0.27	U	1600		80	J	140	J	0.76	U	0.68	U	0.82		0.21	U
Hexachlorobutadiene	U	3.9	U	0.24	U	900	U	90	U	100	U	3.8	U	3.4	U	3.5	U	0.19	U
Isopropylbenzene	U	0.78	U	0.3	U	2800		95	J	210	J	0.76	U	0.68	U	0.58	J	0.23	U
m&p-Xylene	U	1.4		0.58	U	800	U	80	U	89	U	0.61	J	0.68	U	3.5		0.45	U
Methyl tert-Butyl Ether	U	1.6	U	0.3	U	240	U	24	U	27	U	1.5	U	1.4	U	1.4	U	0.23	U
Methylene Chloride	U	7.8	U	5.4	U	760	U	77	U	85	U	7.6	U	6.8	U	7.1	U	4.2	U
Naphthalene	U	3.9	U	3.9	U	7900	U	470	U	650	U	3.8	U	3.4	U	3.5	U	3	U
n-Butylbenzene	U	1.8		0.29	U	8100		300	J	660	J	0.76	U	0.68	U	0.71	U	0.23	U
n-Propylbenzene	U	0.78	U	0.27	U	6100		170	J	390	J	0.76	U	0.68	U	0.71	U	0.21	U
o-Xylene	U	0.78	U	0.46	U	630	U	63	U	70	U	0.76	U	0.68	U	1.4		0.36	U
p-Isopropyltoluene	U	2.7		0.26	U	6400		69	U	120		0.76	U	0.68	U	0.71	U	0.2	U
sec-Butylbenzene		1.4		0.26	U	4700		180	J	440	J	0.76	U	2		6.1		0.2	U
Styrene	U	0.78	U	0.48	U	920	U	92	U	100	U	0.76	U	0.68	U	0.71	U	0.37	U
tert-Butylbenzene	J	0.93	J	0.27	U	600	U	60	U	67	U	3.8	U	1	J	2.6	J	0.21	U
Tetrachloroethene	U	0.78	U	0.26	U	890	U	89	U	99	U	0.76	U	0.68	U	0.71	U	0.2	U
Toluene	U	1.2	U	0.23	U	650	U	65	U	72	U	1.1	U	1	U	1.1	U	0.18	U
trans-1,2-Dichloroethene	U	1.2	U	0.25	U	710	U	71	U	79	U	1.1	U	1	U	1.1	U	0.19	U
trans-1,3-Dichloropropene	U	0.78	U	0.15	U	500	U	50	U	56	U	0.76	U	0.68	U	0.71	U	0.12	U
Trichloroethene	U	0.78	U	0.28	U	700	U	70	U	78	U	0.76	U	0.68	U	0.71	U	0.22	U
Trichlorofluoromethane	U	3.9	U	0.32	U	600	U	60	U	67	U	3.8	U	3.4	U	3.5	U	0.24	U
Vinyl Chloride	U	1.6	U	0.43	U	560	U	56	U	63	U	1.5	U	1.4	U	1.4	U	0.34	U
Semivolatile Organic Analysis (UG/KG)																			
1,2,4-Trichlorobenzene	U	600	U	69	UJ	72	U	78	U	76	U	2700	U	560	U	3000	U	70	U
1,2-Dichlorobenzene	U	600	U	67	UJ	70	U	76	U	73	U	2700	U	560	U	3000	U	67	U
1,2-Diphenylhydrazine	U	600	U	61	UJ	64	U	70	U	67	U	2700	U	560	U	3000	U	62	U
1,3-Dichlorobenzene	U	600	U	69	UJ	72	U	78	U	76	U	2700	U	560	U	3000	U	70	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number		DA-S-SB03 0607-01		DA-S-SB04 0102-01		DA-S-SB04 2535-01		DA-S-SB04-0910-01		DA-S-SB-DUP06-01		DA-S-SB05 0102-01		DA-S-SB05 0203-01		DA-S-SB05 0304-01		DA-S-SB06 0515-01	
Sample Location		SB03		SB04		SB04		SB04		SB04		SB05		SB05		SB05		SB06	
Date Sampled		8/19/2003		8/18/2003		8/18/2003		8/18/2003		8/18/2003		8/19/2003		8/19/2003		8/19/2003		8/18/2003	
Interval		6.0-7.0		1.0-2.0		2.5-3.5		9.0-10.0		9.0-10.0		1.0-2.0		2.0-3.0		3.0-4.0		0.5-1.5	
QC Identifier		None		None		None		Field Dup. DA-S-SB04-0910-01		Field Dup. DA-S-SB04-0910-01		None		None		None		None	
1,4-Dichlorobenzene	U	600	U	74	UJ	77	U	84	U	81	U	2700	U	560	U	3000	U	75	U
2,2'-oxybis(1-Chloropropane)	U	600	U	58	UJ	61	U	66	U	64	U	2700	U	560	U	3000	U	59	U
2,4,5-Trichlorophenol	U	600	U	120	UJ	130	U	140	U	130	U	2700	U	560	U	3000	U	120	U
2,4,6-Trichlorophenol	U	600	U	200	UJ	210	U	230	U	220	U	2700	U	560	U	3000	U	210	U
2,4-Dichlorophenol	U	1200	U	140	UJ	150	U	160	U	160	U	5400	U	1100	U	6100	U	140	U
2,4-Dimethylphenol	U	1200	U	500	UJ	520	U	570	U	550	U	5400	U	1100	U	6100	U	500	U
2,4-Dinitrophenol	U	2400	U	140	UJ	140	U	160	U	150	U	11000	U	2200	U	12000	U	140	U
2,4-Dinitrotoluene	U	710	U	66	UJ	69	U	75	U	72	U	3200	U	670	U	3600	U	66	U
2,6-Dichlorophenol	U	1200	U	120	UJ	130	U	140	U	130	U	5400	U	1100	U	6100	U	120	U
2,6-Dinitrotoluene	U	600	U	76	UJ	80	U	87	U	84	U	2700	U	560	U	3000	U	77	U
2-Chloronaphthalene	U	710	U	62	UJ	65	U	71	U	68	U	3200	U	670	U	3600	U	63	U
2-Chlorophenol	U	710	U	130	UJ	130	U	140	U	140	U	3200	U	670	U	3600	U	130	U
2-Methylnaphthalene	U	950	U	210	UJ	220	U	240	U	230	U	4300	U	900	U	4900	U	210	U
2-Methylphenol	U	710	U	160	UJ	170	U	180	U	180	U	3200	U	670	U	3600	U	160	U
2-Nitroaniline	U	600	U	140	UJ	150	U	160	U	150	U	2700	U	560	U	3000	U	140	U
2-Nitrophenol	U	2400	U	160	UJ	160	U	180	U	170	U	11000	U	2200	U	12000	U	160	U
3,3'-Dichlorobenzidine	UJ	6000	UJ	98	UJ	100	UJ	110	UJ	110	UJ	27000	U	5600	U	30000	U	99	U
3+4-Methylphenols	U	710	U	180	UJ	180	U	200	U	190	U	3200	U	670	U	3600	U	180	U
3-Methylphenol	U	710	U	660	U	690	U	750	U	720	U	3200	U	670	U	3600	U	670	U
3-Nitroaniline	U	600	U	99	UJ	100	U	110	U	110	U	2700	U	560	U	3000	U	100	U
4,6-Dinitro-2-methylphenol	U	2400	U	110	UJ	120	U	130	U	120	U	11000	U	2200	U	12000	U	110	U
4-Bromophenyl-phenylether	U	600	U	47	UJ	49	U	54	U	52	U	2700	U	560	U	3000	U	48	U
4-Chloro-3-methylphenol	U	600	U	180	UJ	190	U	210	U	200	U	2700	U	560	U	3000	U	180	U
4-Chloroaniline	UJ	600	UJ	210	UJ	220	UJ	240	UJ	230	UJ	2700	U	560	U	3000	U	210	U
4-Chlorophenyl-phenylether	U	600	U	68	UJ	71	U	77	U	74	U	2700	U	560	U	3000	U	68	U
4-Nitroaniline	U	830	U	180	UJ	190	U	210	U	200	U	3800	U	790	U	4300	U	180	U
4-Nitrophenol	U	1200	U	230	UJ	240	U	260	U	250	U	5400	U	1100	U	6100	U	230	U
Acenaphthene	U	600	U	64	UJ	67	U	72	U	70	U	2700	U	560	U	3000	U	64	U
Acenaphthylene	U	600	U	84	UJ	87	U	95	U	92	U	2700	U	560	U	3000	U	84	U
Anthracene	U	600	U	54	J	44	U	47	U	46	U	2700	U	560	U	3000	U	42	U
Benzidine	UJ	6000	UJ	3800	UJ	3900	UJ	4300	UJ	4100	UJ	27000	UJ	5600	UJ	30000	UJ	3800	UJ
Benzo(a)anthracene	U	600	U	190	J	79	U	86	U	83	U	2700	U	560	U	580	J	200	J
Benzo(a)pyrene	U	600	U	130	J	82	U	89	U	86	U	2700	U	560	U	3000	U	160	J
Benzo(b)fluoranthene	U	600	U	120	J	100	U	110	U	110	U	2700	U	560	U	3000	U	180	J
Benzo(g,h,i)perylene	U	600	U	110	UJ	120	U	130	U	120	U	2700	U	560	U	3000	U	120	J
Benzo(k)fluoranthene	U	600	U	130	J	77	U	83	U	80	U	2700	U	560	U	3000	U	160	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number		DA-S-SB03 0607-01		DA-S-SB04 0102-01		DA-S-SB04 2535-01		DA-S-SB04-0910-01		DA-S-SB-DUP06-01		DA-S-SB05 0102-01		DA-S-SB05 0203-01		DA-S-SB05 0304-01		DA-S-SB06 0515-01	
Sample Location		SB03		SB04		SB04		SB04		SB04		SB05		SB05		SB05		SB06	
Date Sampled		8/19/2003		8/18/2003		8/18/2003		8/18/2003		8/18/2003		8/19/2003		8/19/2003		8/19/2003		8/18/2003	
Interval		6.0-7.0		1.0-2.0		2.5-3.5		9.0-10.0		9.0-10.0		1.0-2.0		2.0-3.0		3.0-4.0		0.5-1.5	
QC Identifier		None		None		None		Field Dup. DA-S-SB04-0910-01		Field Dup. DA-S-SB04-0910-01		None		None		None		None	
Benzoic acid	U	6000	U	220	UJ	230	UJ	250	UJ	240	UJ	27000	U	5600	U	30000	U	220	UJ
Benzyl Alcohol	U	1200	U	180	UJ	190	U	210	U	200	U	5400	UJ	1100	U	6100	UJ	180	UJ
Bis(2-Chloroethoxy)methane	U	600	U	77	UJ	80	U	88	U	84	U	2700	U	560	U	3000	U	78	U
Bis(2-Chloroethyl)ether	U	600	U	70	UJ	74	U	80	U	77	U	2700	U	560	U	3000	U	71	U
bis(2-Ethylhexyl)phthalate	J	1200	U	400	U	110	U	120	U	120	U	5400	U	410	J	6100	U	880	U
Butylbenzylphthalate	U	600	U	100	UJ	100	U	110	U	110	U	2700	U	560	U	3000	U	100	U
Carbazole	U	600	U	73	UJ	76	U	83	U	80	U	2700	U	560	U	3000	U	74	U
Chrysene	U	600	U	180	J	81	U	89	U	85	U	2700	U	560	U	600	J	300	J
Dibenzo(a,h)anthracene	U	600	U	140	UJ	140	U	160	U	150	U	2700	U	560	U	3000	U	140	U
Dibenzofuran	U	600	U	120	UJ	120	U	130	U	130	U	2700	U	560	U	3000	U	120	U
Diethylphthalate	U	600	U	66	UJ	69	U	170	U	120	U	2700	U	560	U	3000	U	73	U
Dimethylphthalate	U	600	U	65	UJ	68	U	74	U	71	U	2700	U	560	U	3000	U	65	U
Di-n-Butylphthalate	U	600	U	74	UJ	77	U	84	U	81	U	2700	U	560	U	3000	U	74	U
Di-n-octylphthalate	U	600	U	130	UJ	140	U	150	U	140	U	2700	U	560	U	3000	U	130	U
Fluoranthene	U	600	U	390	J	66	U	72	U	69	U	2700	U	560	U	1100	J	540	J
Fluorene	U	600	U	63	UJ	66	U	72	U	69	U	2700	U	560	U	3000	U	64	U
Hexachlorobenzene	U	600	U	52	UJ	54	U	59	U	57	U	2700	U	560	U	3000	U	53	U
Hexachlorobutadiene	U	1200	U	97	UJ	100	U	110	U	110	U	5400	U	1100	U	6100	U	98	U
Hexachloroethane	U	600	U	76	UJ	80	U	87	U	84	U	2700	U	560	U	3000	U	77	U
Indeno(1,2,3-cd)pyrene	U	830	U	150	UJ	160	U	170	U	160	U	3800	U	790	U	4300	U	150	U
Isophorone	U	600	U	76	UJ	80	U	87	U	84	U	2700	U	560	U	3000	U	77	U
Naphthalene	U	600	U	81	UJ	84	U	120	J	130	J	2700	U	560	U	3000	U	82	U
Nitrobenzene	U	600	U	100	UJ	100	U	110	U	110	U	2700	U	560	U	3000	U	100	U
N-nitrosodimethylamine	U	6000	U	66	UJ	69	U	75	U	72	U	27000	U	5600	U	30000	U	67	U
N-Nitroso-di-n-propylamine	U	600	U	65	UJ	68	U	74	U	72	U	2700	U	560	U	3000	U	66	U
N-Nitroso-diphenylamine	U	1800	U	94	UJ	98	U	110	U	100	U	8100	U	1700	U	9100	U	95	U
N-nitrosopyrrolidine	U	2400	U	1400	UJ	1500	U	1600	U	1600	U	11000	U	2200	U	12000	U	1400	U
Pentachlorophenol	U	2400	U	380	UJ	400	U	430	U	420	U	11000	U	2200	U	12000	U	380	U
Phenanthrene	U	600	U	260	J	66	U	72	U	69	U	2700	U	560	U	390	J	280	J
Phenol	U	830	U	100	UJ	110	U	120	U	110	U	3800	U	790	U	4300	U	100	U
Pyrene	U	600	U	340	J	72	U	78	U	76	U	2700	U	560	U	950	J	450	J
Pesticide/PCB Analysis (UG/KG)																			
4,4'-DDD	UJ	119	UJ	18.7	U	19.5	U	2.12	U	2.05	UJ	215	UJ	4.49	UJ	244	UJ	189	U
4,4'-DDE	UJ	119	UJ	8.79	U	9.2	U	1.0	U	0.964	UJ	215	UJ	4.49	UJ	244	UJ	88.9	U
4,4'-DDT	UJ	119	UJ	17.6	U	18.4	U	2.0	U	1.93	UJ	215	UJ	4.49	UJ	244	UJ	178	U
Aldrin	UJ	59.5	UJ	5.49	U	5.75	U	0.625	U	0.602	UJ	108	UJ	2.25	UJ	122	UJ	55.6	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number		DA-S-SB03 0607-01		DA-S-SB04 0102-01		DA-S-SB04 2535-01		DA-S-SB04-0910-01		DA-S-SB-DUP06-01		DA-S-SB05 0102-01		DA-S-SB05 0203-01		DA-S-SB05 0304-01		DA-S-SB06 0515-01	
Sample Location		SB03		SB04		SB04		SB04		SB04		SB05		SB05		SB05		SB06	
Date Sampled		8/19/2003		8/18/2003		8/18/2003		8/18/2003		8/18/2003		8/19/2003		8/19/2003		8/19/2003		8/18/2003	
Interval		6.0-7.0		1.0-2.0		2.5-3.5		9.0-10.0		9.0-10.0		1.0-2.0		2.0-3.0		3.0-4.0		0.5-1.5	
QC Identifier		None		None		None		Field Dup. DA-S-SB04-0910-01		Field Dup. DA-S-SB04-0910-01		None		None		None		None	
alpha-BHC	UJ	59.5	UJ	5.49	U	5.75	U	0.625	U	0.602	UJ	108	UJ	2.25	UJ	122	UJ	55.6	U
alpha-Chlordane	UJ	59.5	UJ	6.59	U	6.9	U	0.75	U	0.723	UJ	108	UJ	2.25	UJ	122	UJ	66.7	U
Aroclor-1016	UJ	59.5	UJ	21.4	U	22.4	U	24.4	U	23.5	UJ	53.8	UJ	56.2	UJ	305	UJ	21.7	U
Aroclor-1016/1242	U	59.5	U	54.9	U	57.5	U	62.5	U	60.2	U	53.8	U	56.2	U	305	U	55.6	U
Aroclor-1221	UJ	59.5	UJ	21.4	U	22.4	U	24.4	U	23.5	UJ	53.8	UJ	56.2	UJ	305	UJ	21.7	U
Aroclor-1232	UJ	59.5	UJ	21.4	U	22.4	U	24.4	U	23.5	UJ	53.8	UJ	56.2	UJ	305	UJ	21.7	U
Aroclor-1242	UJ	59.5	UJ	21.4	U	22.4	U	24.4	U	23.5	UJ	53.8	UJ	56.2	UJ	305	UJ	21.7	U
Aroclor-1248	UJ	59.5	UJ	21.4	U	22.4	U	24.4	U	23.5	UJ	53.8	UJ	56.2	UJ	305	UJ	21.7	U
Aroclor-1254	UJ	59.5	UJ	21.4	U	22.4	U	24.4	U	23.5	UJ	53.8	UJ	56.2	UJ	305	UJ	21.7	U
Aroclor-1260	UJ	59.5	UJ	12.1	U	12.6	U	13.8	U	13.2	UJ	53.8	UJ	56.2	UJ	305	UJ	12.2	U
Aroclor-1268	UJ	59.5	UJ	94.1		22.4	U	24.4	U	23.5	UJ	53.8	UJ	56.2	UJ	305	UJ	117	
beta-BHC	UJ	59.5	UJ	14.3	U	14.9	U	1.62	U	1.57	UJ	108	UJ	2.25	UJ	122	UJ	144	U
delta-BHC	UJ	59.5	UJ	5.49	U	5.75	U	0.625	U	0.602	UJ	108	UJ	2.25	UJ	122	UJ	55.6	U
Dieldrin	UJ	119	UJ	7.69	U	8.04	U	0.875	U	0.843	UJ	215	UJ	4.49	UJ	244	UJ	77.8	U
Endosulfan I	UJ	59.5	UJ	5.49	U	5.75	U	0.625	U	0.602	UJ	108	UJ	2.25	UJ	122	UJ	55.6	U
Endosulfan II	UJ	119	UJ	18.7	U	19.5	U	2.12	U	2.05	UJ	215	UJ	4.49	UJ	244	UJ	189	U
Endosulfan Sulfate	UJ	119	UJ	12.1	U	12.6	U	1.38	U	1.32	UJ	215	UJ	4.49	UJ	244	UJ	122	U
Endrin	UJ	119	UJ	8.79	U	9.2	U	1.0	U	0.964	UJ	215	UJ	4.49	UJ	244	UJ	88.9	U
Endrin Aldehyde	UJ	119	UJ	14.3	U	14.9	U	1.62	U	1.57	UJ	215	UJ	4.49	UJ	244	UJ	144	U
Endrin Ketone	UJ	119	UJ	9.89	U	10.3	U	1.12	U	1.08	UJ	215	UJ	4.49	UJ	244	UJ	100	U
gamma-BHC	UJ	59.5	UJ	5.49	U	5.75	U	0.625	U	0.602	UJ	108	UJ	2.25	UJ	122	UJ	55.6	U
gamma-Chlordane	UJ	59.5	UJ	5.49	U	5.75	U	0.625	U	0.602	UJ	108	UJ	2.25	UJ	122	UJ	55.6	U
Heptachlor	UJ	59.5	UJ	6.59	U	6.9	U	0.75	U	0.723	UJ	108	UJ	2.25	UJ	122	UJ	66.7	U
Heptachlor Epoxide	UJ	59.5	UJ	5.49	U	5.75	U	0.625	U	0.602	UJ	108	UJ	2.25	UJ	122	UJ	55.6	U
Hexachlorobenzene	UJ	595	UJ	220	U	230	U	25	U	24.1	UJ	1080	UJ	22.5	UJ	1220	UJ	2220	U
Methoxychlor	UJ	595	UJ	50.5	U	52.9	U	5.75	U	5.54	UJ	1080	UJ	22.5	UJ	1220	UJ	511	U
Toxaphene	UJ	1490	UJ	444	U	464	U	50.5	U	48.7	UJ	2690	UJ	56.2	UJ	3050	UJ	4490	U
TAL Metal Analysis (MG/KG)																			
Aluminum		9200		5200		5300		3900		3700		4300		12000		9200		4100	
Antimony	U	0.094	U	0.28	U	0.13	U	0.13	U	0.11	U	0.085	U	0.23	U	0.11	U	0.19	U
Arsenic		30.0		41.0	J	13.0	J	24.0	J	24.0	J	7.7		33.0		17.0		12.0	J
Barium		60.0		12.0		28.0		10.0		10.0		10.0		12.0		18.0		13.0	
Beryllium		0.68		0.31		0.35		0.27	U	0.25	U	0.35		0.34		0.36		0.28	
Cadmium	U	0.094	U	0.017	UJ	0.018	UJ	0.020	UJ	0.019	UJ	0.058	U	0.018	U	0.019	U	0.73	J
Calcium		740		810		430		380		510		520		1900		2000		1100	
Chromium	J	13.0	J	7.7		9.5		7.5		7.3		5.6	J	15.0	J	11.0	J	8.6	

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APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number		DA-S-SB03 0607-01		DA-S-SB04 0102-01		DA-S-SB04 2535-01		DA-S-SB04-0910-01		DA-S-SB-DUP06-01		DA-S-SB05 0102-01		DA-S-SB05 0203-01		DA-S-SB05 0304-01		DA-S-SB06 0515-01	
Sample Location		SB03		SB04		SB04		SB04		SB04		SB05		SB05		SB05		SB06	
Date Sampled		8/19/2003		8/18/2003		8/18/2003		8/18/2003		8/18/2003		8/19/2003		8/19/2003		8/19/2003		8/18/2003	
Interval		6.0-7.0		1.0-2.0		2.5-3.5		9.0-10.0		9.0-10.0		1.0-2.0		2.0-3.0		3.0-4.0		0.5-1.5	
QC Identifier		None		None		None		Field Dup. DA-S-SB04-0910-01		Field Dup. DA-S-SB04-0910-01		None		None		None		None	
Cobalt		16.0		18.0		14.0		14.0		14.0		4.7		14.0		9.9		8.8	
Copper		5.8		21.0		13.0		26.0		23.0		9.0		26.0		19.0		18.0	
Iron		43000		22000		20000		24000		23000		10000		29000		22000		17000	
Lead		13.0		12.0		7.2		7.0		6.8		12.0		13.0		15.0		9.8	
Magnesium	J	1700	J	1600		1400		1400		1300		1400	J	3900	J	2400	J	1400	
Manganese		1300		340		2000		280		390		150		370		440		390	
Mercury	J	0.0136	J	0.00724	U	0.00769	U	0.00802	U	0.00847	U	0.00778	U	0.025		0.0377		0.0161	
Molybdenum	U	0.24	U	0.43	U	0.32	U	0.36	U	0.56	U	0.39	U	0.32	U	0.35	U	0.70	U
Nickel		8.6		18.0		17.0		22.0		22.0		7.4		23.0		16.0		12.0	
Potassium		260		140		150		130		160		540		140		200		320	
Selenium	U	0.14	U	0.11	U	0.11	U	0.12	U	0.12	U	0.10	U	0.11	U	0.12	U	0.11	U
Silver		0.12		0.81		0.16	U	0.034	U	0.033	U	0.030	U	0.034	J	0.12		0.032	U
Sodium	U	60.0	U	33.0	U	30.0	U	25.0	U	26.0	U	73.0	J	60.0	U	36.0	U	41.0	U
Thallium	U	0.82	U	0.38		0.80	U	0.17	J	0.30	J	0.15	U	0.78	U	0.17	U	0.15	U
Vanadium		30.0		9.1		14.0		9.5		9.3		8.2		16.0		13.0		9.7	
Zinc	J	30.0	J	39.0	J	34.0	J	42.0	J	40.0	J	28.0	J	48.0	J	46.0	J	39.0	J
Total Petroleum Hydrocarbon Analysis (UG/KG)																			
Diesel Range Organics	U	22000	J	23000	J	300000		250000		370000		83000		56000	U	13000		230000	
Gasoline Range Organics	J	19000		970	U	920000		41000	J	130000	J	580	J	390	J	1400	J	740	U
Miscellaneous Analysis (%)																			
TOTAL SOLIDS		84.0		91.0		87.0		80.0		83.0		93.0		89.0		82.0		90.0	

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APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SB06 2535-01		DA-S-SB07 0102-01		DA-S-SB08 0102-01		DA-S-SB08-0607-01		DA-S-MW-DUP07-01		DA-S-TP01 0001-01		DA-S-TP01 0304-01		DA-S-TP01 0607-01		DA-S-TP02 0001-01	
Sample Location	SB06		SB07		SB08		SB08		SB08		TP01		TP01		TP01		TP02	
Date Sampled	8/18/2003		8/18/2003		8/19/2003		8/19/2003		8/19/2003		8/11/2003		8/11/2003		8/11/2003		8/13/2003	
Interval	2.5-3.5		1.0-2.0		1.0-2.0		6.0-7.0		6.0-7.0		0.0-1.0		3.0-4.0		6.0-7.0		0.0-1.0	
QC Identifier	None		None		None		Field Dup. DA-S-SB08-0607-01		Field Dup. DA-S-SB08-0607-01		None		None		None		None	
Volatile Organic Analysis (UG/KG)																		
1,1,1,2-Tetrachloroethane	0.14	U	0.13	U	0.7	U	0.73	U	0.72	U	120	U	0.21	U	0.21	U	0.17	U
1,1,1-Trichloroethane	0.28	U	0.26	U	0.7	U	0.73	U	0.72	U	99	U	0.42	U	0.44	U	0.35	U
1,1,2,2-Tetrachloroethane	0.18	U	0.17	U	0.7	U	0.73	U	0.72	U	120	U	0.28	U	0.28	U	0.23	U
1,1,2-Trichloroethane	0.2	U	0.19	U	1	U	1.1	U	1.1	U	64	U	0.3	U	0.31	U	0.25	U
1,1-Dichloroethane	0.3	U	0.28	U	1	U	1.1	U	1.1	U	75	U	0.45	U	0.46	U	0.37	U
1,1-Dichloroethene	0.36	U	0.34	U	0.7	U	0.73	U	0.72	U	150	U	0.55	U	0.56	U	0.46	U
1,1-Dichloropropene	0.24	U	0.23	U	3.5	U	3.6	U	3.6	U	140	U	0.37	U	0.38	U	0.3	U
1,2,3-Trichlorobenzene	0.16	U	0.15	U	3.5	U	3.6	U	3.6	U	150	U	0.24	U	0.25	U	0.2	U
1,2,3-Trichloropropane	0.2	U	0.19	U	7	U	7.3	U	7.2	U	90	U	0.3	U	0.31	U	0.25	U
1,2,4-Trichlorobenzene	0.23	U	0.22	U	3.5	U	3.6	U	3.6	U	110	U	0.35	U	0.36	U	0.29	U
1,2,4-Trimethylbenzene	0.22	U	0.21	U	3.5	U	3.6	U	3.6	U	1600		0.34	U	0.35	U	0.28	U
1,2-Dibromo-3-chloropropane	0.33	U	0.32	U	3.5	U	3.6	U	3.6	U	630	U	0.51	U	0.52	U	0.42	U
1,2-Dibromoethane	0.061	U	0.057	U	3.5	U	3.6	U	3.6	U	90	U	0.092	U	0.095	U	0.077	U
1,2-Dichlorobenzene	0.19	U	0.18	U	3.5	U	3.6	U	3.6	U	61	U	0.28	U	0.29	U	0.24	U
1,2-Dichloroethane	0.17	U	0.16	U	0.7	U	0.73	U	0.72	U	56	U	0.25	U	0.26	U	0.21	U
1,2-Dichloropropane	0.16	U	0.15	U	2.4	U	2.5	U	2.5	U	95	U	0.24	U	0.25	U	0.2	U
1,3,5-Trimethylbenzene	0.19	U	0.18	U	3.5	U	3.6	U	3.6	U	860	J	0.29	U	0.3	U	0.24	U
1,3-Dichlorobenzene	0.16	U	0.16	U	3.5	U	3.6	U	3.6	U	79	U	0.25	U	0.26	U	0.21	U
1,3-Dichloropropane	0.24	U	0.23	U	3.5	U	3.6	U	3.6	U	69	U	0.37	U	0.38	U	0.31	U
1,4-Dichlorobenzene	0.14	U	0.13	U	3.5	U	3.6	U	3.6	U	93	U	0.21	U	0.21	U	0.17	U
2,2-Dichloropropane	0.29	U	0.27	U	3.5	U	3.6	U	3.6	U	250	U	0.44	U	0.45	U	0.36	U
2-Butanone	2.8	J	0.27	U	7	U	5.8	J	3.4	J	660	U	0.43	U	0.44	U	0.36	U
2-Chlorotoluene	0.25	U	0.24	U	3.5	U	3.6	U	3.6	U	94	U	0.38	U	0.39	U	0.32	U
2-Hexanone	0.22	U	0.21	U	7	U	7.3	U	7.2	U	720	U	0.34	U	0.34	U	0.28	U
4-Chlorotoluene	0.26	U	0.24	U	3.5	U	3.6	U	3.6	U	97	U	0.39	U	0.4	U	0.32	U
4-Methyl-2-Pentanone	0.38	U	0.35	U	7	U	7.3	U	7.2	U	160	U	0.57	U	0.58	U	0.47	U
Acetone	25		50		38	J	72	J	28	J	590	U	7.1	U	7.3	U	5.9	U
Benzene	0.2	U	0.19	U	0.7	U	0.73	U	0.72	U	120	U	0.3	U	0.31	U	0.25	U
Bromobenzene	0.26	U	0.24	U	3.5	U	3.6	U	3.6	U	59	U	0.39	U	0.4	U	0.33	U
Bromochloromethane	0.17	U	0.16	U	3.5	U	3.6	U	3.6	U	77	U	0.26	U	0.27	U	0.22	U
Bromodichloromethane	0.25	U	0.24	U	0.7	U	0.73	U	0.72	U	96	U	0.38	U	0.39	U	0.32	U
Bromoform	0.18	U	0.17	U	2.8	U	2.9	U	2.9	U	440	U	0.27	U	0.28	U	0.23	U
Bromomethane	1	U	0.98	U	1.4	U	1.4	U	1.4	U	140	UJ	1.6	U	1.6	U	1.3	U
Carbon Disulfide	0.3	U	0.28	U	7	U	1.2	J	7.2	U	110	U	0.46	U	0.47	U	0.38	U
Carbon Tetrachloride	0.34	U	0.32	U	0.7	U	0.73	U	0.72	U	150	U	0.51	U	0.52	U	0.42	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SB06 2535-01		DA-S-SB07 0102-01		DA-S-SB08 0102-01		DA-S-SB08-0607-01		DA-S-MW-DUP07-01		DA-S-TP01 0001-01		DA-S-TP01 0304-01		DA-S-TP01 0607-01		DA-S-TP02 0001-01	
Sample Location	SB06		SB07		SB08		SB08		SB08		TP01		TP01		TP01		TP02	
Date Sampled	8/18/2003		8/18/2003		8/19/2003		8/19/2003		8/19/2003		8/11/2003		8/11/2003		8/11/2003		8/13/2003	
Interval	2.5-3.5		1.0-2.0		1.0-2.0		6.0-7.0		6.0-7.0		0.0-1.0		3.0-4.0		6.0-7.0		0.0-1.0	
QC Identifier	None		None		None		Field Dup. DA-S-SB08-0607-01		Field Dup. DA-S-SB08-0607-01		None		None		None		None	
Chlorobenzene	0.21	U	0.2	U	0.7	U	0.73	U	0.72	U	130	U	0.32	U	0.33	U	0.27	U
Chloroethane	0.21	U	0.2	U	1.4	U	1.4	U	1.4	U	140	UJ	0.32	U	0.32	U	0.26	U
Chloroform	0.24	U	0.23	U	1	U	1.1	U	1.1	U	55	U	0.37	U	0.38	U	0.31	U
Chloromethane	0.37	U	0.35	U	3.5	U	3.6	U	3.6	U	47	U	0.56	U	0.58	U	0.47	U
cis-1,2-Dichloroethene	0.27	U	0.26	U	0.7	U	0.73	U	0.72	U	74	U	0.41	U	0.42	U	0.34	U
cis-1,3-Dichloropropene	0.16	U	0.15	U	0.7	U	0.73	U	0.72	U	51	U	0.24	U	0.24	U	0.2	U
Dibromochloromethane	0.18	U	0.17	U	0.7	U	0.73	U	0.72	U	76	U	0.27	U	0.28	U	0.22	U
Dibromomethane	0.32	U	0.3	U	7	U	7.3	U	7.2	U	77	U	0.49	U	0.5	U	0.4	U
Dichlorodifluoromethane	0.32	U	0.3	U	7	U	7.3	U	7.2	U	120	U	0.49	U	0.5	U	0.41	U
Ethylbenzene	0.25	U	0.23	U	0.7	U	0.73	U	0.72	U	110	U	0.37	U	0.38	U	0.31	U
Hexachlorobutadiene	0.22	U	0.21	U	3.5	U	3.6	U	3.6	U	170	U	0.33	U	0.34	U	0.28	U
Isopropylbenzene	0.27	U	0.26	U	0.7	U	0.73	U	0.72	U	100	U	0.41	U	0.42	U	0.34	U
m&p-Xylene	0.53	U	0.5	U	0.7	U	1.8	J	0.72	UJ	350		0.96	J	0.82	U	0.66	U
Methyl tert-Butyl Ether	0.27	U	0.26	U	1.4	U	1.4	U	1.4	U	46	U	0.41	U	0.42	U	0.34	U
Methylene Chloride	5	U	4.7	U	7	U	7.3	U	7.2	U	150	U	7.5	U	7.7	U	6.2	U
Naphthalene	3.6	U	3.4	U	3.5	U	3.6	U	3.6	U	780	J	5.4	U	5.5	U	4.5	U
n-Butylbenzene	0.27	U	0.25	U	0.7	U	0.73	U	0.72	U	260		0.41	U	0.42	U	0.34	U
n-Propylbenzene	0.24	U	0.23	U	0.7	U	0.73	U	0.72	U	300		0.37	U	0.38	U	0.31	U
o-Xylene	0.42	U	0.4	U	0.7	U	0.79		0.72	U	230		0.64	U	0.66	U	0.54	U
p-Isopropyltoluene	0.23	U	0.22	U	0.7	U	0.73	U	0.72	U	260		0.36	U	0.36	U	0.3	U
sec-Butylbenzene	0.24	U	0.22	U	0.7	U	0.73	U	0.72	U	160	U	0.36	U	0.37	U	0.3	U
Styrene	0.44	U	0.41	U	0.7	U	0.73	U	0.72	U	180	U	0.67	U	0.68	U	0.55	U
tert-Butylbenzene	0.24	U	0.23	U	3.5	U	3.6	U	3.6	U	120	U	0.37	U	0.38	U	0.31	U
Tetrachloroethene	0.24	U	0.22	U	0.7	U	0.73	U	0.72	U	170	U	0.36	U	0.37	U	0.3	U
Toluene	0.21	U	0.2	U	1	U	1.1	U	1.1	U	120	U	0.32	U	0.32	U	0.26	U
trans-1,2-Dichloroethene	0.22	U	0.21	U	1	U	1.1	U	1.1	U	140	U	0.34	U	0.35	U	0.28	U
trans-1,3-Dichloropropene	0.14	U	0.13	U	0.7	U	0.73	U	0.72	U	96	U	0.21	U	0.21	U	0.17	U
Trichloroethene	0.26	U	0.25	U	0.7	U	0.73	U	0.72	U	130	U	0.4	U	0.41	U	0.33	U
Trichlorofluoromethane	0.29	U	0.27	U	3.5	U	3.6	U	3.6	U	120	U	0.44	U	0.45	U	0.36	U
Vinyl Chloride	0.4	U	0.37	U	1.4	U	1.4	U	1.4	U	110	U	0.6	U	0.61	U	0.5	U
Semivolatile Organic Analysis (UG/KG)																		
1,2,4-Trichlorobenzene	72	U	72	UJ	570	U	570	U	570	U	87	U	74	U	73	U	70	U
1,2-Dichlorobenzene	70	U	70	UJ	570	U	570	U	570	U	84	U	71	U	70	U	68	U
1,2-Diphenylhydrazine	64	U	64	U	570	U	570	U	570	U	78	U	66	U	65	U	63	U
1,3-Dichlorobenzene	72	U	72	U	570	U	570	U	570	U	87	U	74	U	73	U	70	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SB06 2535-01		DA-S-SB07 0102-01		DA-S-SB08 0102-01		DA-S-SB08-0607-01		DA-S-MW-DUP07-01		DA-S-TP01 0001-01		DA-S-TP01 0304-01		DA-S-TP01 0607-01		DA-S-TP02 0001-01	
Sample Location	SB06		SB07		SB08		SB08		SB08		TP01		TP01		TP01		TP02	
Date Sampled	8/18/2003		8/18/2003		8/19/2003		8/19/2003		8/19/2003		8/11/2003		8/11/2003		8/11/2003		8/13/2003	
Interval	2.5-3.5		1.0-2.0		1.0-2.0		6.0-7.0		6.0-7.0		0.0-1.0		3.0-4.0		6.0-7.0		0.0-1.0	
QC Identifier	None		None		None		Field Dup. DA-S-SB08-0607-01		Field Dup. DA-S-SB08-0607-01		None		None		None		None	
1,4-Dichlorobenzene	77	U	77	U	570	U	570	U	570	U	94	U	79	U	78	U	76	U
2,2'-oxybis(1-Chloropropane)	61	U	61	U	570	U	570	U	570	U	74	U	62	U	62	U	60	U
2,4,5-Trichlorophenol	130	U	130	U	570	U	570	U	570	U	150	U	130	U	130	U	120	U
2,4,6-Trichlorophenol	210	U	210	U	570	U	570	U	570	U	260	U	220	U	220	U	210	U
2,4-Dichlorophenol	150	U	150	U	1100	U	1100	U	1100	U	180	U	150	U	150	U	150	U
2,4-Dimethylphenol	520	U	520	U	1100	U	1100	U	1100	U	630	U	540	U	530	U	510	U
2,4-Dinitrophenol	140	U	140	U	2300	U	2300	U	2300	U	170	U	140	U	140	U	140	U
2,4-Dinitrotoluene	69	U	69	U	680	U	690	U	690	U	83	U	70	U	70	U	67	U
2,6-Dichlorophenol	130	U	130	U	1100	U	1100	U	1100	U	160	U	130	U	130	U	120	U
2,6-Dinitrotoluene	80	U	80	U	570	U	570	U	570	U	97	U	82	U	81	U	78	U
2-Chloronaphthalene	65	U	65	U	680	U	690	U	690	U	79	U	67	U	66	U	64	U
2-Chlorophenol	130	U	130	UJ	680	U	690	U	690	U	160	U	140	U	130	U	130	U
2-Methylnaphthalene	220	U	220	UJ	910	U	920	U	920	U	260	U	220	U	220	U	210	U
2-Methylphenol	170	U	170	UJ	680	U	690	U	690	U	200	U	170	U	170	U	160	U
2-Nitroaniline	150	U	150	U	570	U	570	U	570	U	180	U	150	U	150	U	140	U
2-Nitrophenol	160	U	160	U	2300	U	2300	U	2300	U	200	U	170	U	170	U	160	U
3,3'-Dichlorobenzidine	100	UJ	100	UJ	5700	U	5700	UJ	5700	UJ	120	U	100	U	100	U	100	U
3+4-Methylphenols	180	U	180	U	680	U	690	U	690	U	220	U	190	U	190	U	180	U
3-Methylphenol	690	U	690	U	680	U	690	U	690	U	830	U	700	U	700	U	670	U
3-Nitroaniline	100	U	100	U	570	U	570	U	570	U	120	U	110	U	100	U	100	U
4,6-Dinitro-2-methylphenol	120	U	120	U	2300	U	2300	U	2300	U	140	U	120	U	120	U	110	U
4-Bromophenyl-phenylether	49	U	49	U	570	U	570	U	570	U	60	U	50	U	50	U	48	U
4-Chloro-3-methylphenol	190	U	190	U	570	U	570	U	570	U	230	U	200	U	190	U	190	U
4-Chloroaniline	220	UJ	220	UJ	570	U	570	UJ	570	UJ	260	U	220	U	220	U	210	U
4-Chlorophenyl-phenylether	71	U	71	U	570	U	570	U	570	U	86	U	72	U	72	U	69	U
4-Nitroaniline	190	U	190	U	800	U	800	U	800	U	230	U	200	U	190	U	190	U
4-Nitrophenol	240	U	240	U	1100	U	1100	U	1100	U	290	U	240	U	240	U	230	U
Acenaphthene	67	U	67	U	570	U	570	U	570	U	130	J	73	J	120	J	250	J
Acenaphthylene	87	U	87	U	570	U	570	U	570	U	100	U	89	U	94	J	85	U
Anthracene	44	U	44	U	44	J	570	U	570	U	370	J	170	J	340	J	500	J
Benzidine	3900	UJ	3900	UJ	5700	UJ	5700	UJ	5700	UJ	4800	U	4000	U	4000	U	3800	UJ
Benzo(a)anthracene	79	U	79	U	280	J	570	U	570	U	900		760		1300		1800	
Benzo(a)pyrene	82	U	82	U	190	J	570	U	570	U	730		730		1200		1300	
Benzo(b)fluoranthene	100	U	100	U	180	J	570	U	570	U	630	J	660		1100		1400	
Benzo(g,h,i)perylene	120	U	120	U	570	U	570	U	570	U	500	J	530	J	850		910	
Benzo(k)fluoranthene	77	U	77	U	200	J	570	U	570	U	680	J	700		1100		1200	

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SB06 2535-01		DA-S-SB07 0102-01		DA-S-SB08 0102-01		DA-S-SB08-0607-01		DA-S-MW-DUP07-01		DA-S-TP01 0001-01		DA-S-TP01 0304-01		DA-S-TP01 0607-01		DA-S-TP02 0001-01	
Sample Location	SB06		SB07		SB08		SB08		SB08		TP01		TP01		TP01		TP02	
Date Sampled	8/18/2003		8/18/2003		8/19/2003		8/19/2003		8/19/2003		8/11/2003		8/11/2003		8/11/2003		8/13/2003	
Interval	2.5-3.5		1.0-2.0		1.0-2.0		6.0-7.0		6.0-7.0		0.0-1.0		3.0-4.0		6.0-7.0		0.0-1.0	
QC Identifier	None		None		None		Field Dup. DA-S-SB08-0607-01		Field Dup. DA-S-SB08-0607-01		None		None		None		None	
Benzoic acid	230	UJ	230	UJ	5700	U	5700	U	5700	U	280	U	240	U	230	U	220	UJ
Benzyl Alcohol	190	U	190	U	1100	U	1100	U	1100	U	230	U	190	U	190	U	180	UJ
Bis(2-Chloroethoxy)methane	80	U	80	UJ	570	U	570	U	570	U	97	U	82	U	81	U	79	U
Bis(2-Chloroethyl)ether	74	U	74	U	570	U	570	U	570	U	89	U	75	U	74	U	72	U
bis(2-Ethylhexyl)phthalate	410	U	420	U	410	J	1100	U	1100	U	560	J	460	J	110	U	420	J
Butylbenzylphthalate	100	U	100	U	570	U	570	U	570	U	130	U	110	U	110	U	100	U
Carbazole	76	U	76	U	570	U	570	U	570	U	220	J	160	J	260	J	430	J
Chrysene	81	U	81	U	310	J	570	U	570	U	910		910		1500		1800	
Dibenzo(a,h)anthracene	140	U	140	U	570	U	570	U	570	U	170	U	150	U	230	J	290	J
Dibenzofuran	120	U	120	U	570	U	570	U	570	U	140	U	120	U	120	U	120	U
Diethylphthalate	120	U	210	U	570	U	570	U	570	U	83	U	70	U	70	U	67	U
Dimethylphthalate	68	U	68	U	570	U	570	U	570	U	82	U	69	U	68	U	66	U
Di-n-Butylphthalate	77	U	77	U	570	U	570	U	570	U	93	U	79	U	78	U	75	U
Di-n-octylphthalate	140	U	140	U	570	U	570	U	570	U	170	U	140	U	140	U	130	U
Fluoranthene	66	U	66	U	520	J	570	U	570	U	2200		1900		3300		4200	
Fluorene	66	U	66	U	570	U	570	U	570	U	160	J	80	J	170	J	270	J
Hexachlorobenzene	54	U	54	U	570	U	570	U	570	U	66	U	56	U	55	U	53	U
Hexachlorobutadiene	100	U	100	U	1100	U	1100	U	1100	U	120	U	100	U	100	U	99	U
Hexachloroethane	80	U	80	U	570	U	570	U	570	U	96	U	82	U	81	U	78	U
Indeno(1,2,3-cd)pyrene	160	U	160	U	800	U	800	U	800	U	450	J	460	J	800	J	850	
Isophorone	80	U	80	UJ	570	U	570	U	570	U	97	U	82	U	81	U	78	U
Naphthalene	84	U	84	U	570	U	570	U	570	U	100	U	86	U	86	U	83	U
Nitrobenzene	100	U	100	U	570	U	570	U	570	U	120	U	110	U	100	U	100	U
N-nitrosodimethylamine	69	U	69	U	5700	U	5700	U	5700	U	84	U	71	U	70	U	68	U
N-Nitroso-di-n-propylamine	68	U	68	U	570	U	570	U	570	U	82	U	70	U	69	U	67	U
N-Nitroso-diphenylamine	98	U	98	U	1700	U	1700	U	1700	U	120	U	100	U	99	U	96	U
N-nitrosopyrrolidine	1500	U	1500	UJ	2300	U	2300	U	2300	U	120	U	100	U	99	U	96	U
Pentachlorophenol	400	U	400	U	2300	U	2300	U	2300	U	480	U	400	U	400	U	390	U
Phenanthrene	66	U	66	U	280	J	570	U	570	U	1600		1100		2200		2800	
Phenol	110	U	110	UJ	800	U	800	U	800	U	130	U	110	U	110	U	100	U
Pyrene	72	U	72	U	450	J	570	U	570	U	1800		1600		2800		3400	
Pesticide/PCB Analysis (UG/KG)																		
4,4'-DDD	1.95	UJ	1.95	UJ	22.7	UJ	4.6	UJ	4.6	UJ	94.4	U	80	U	79.1	U	19.1	U
4,4'-DDE	0.92	UJ	0.92	UJ	22.7	UJ	4.6	UJ	4.6	UJ	44.4	U	37.6	U	37.2	U	8.99	U
4,4'-DDT	1.84	UJ	1.84	UJ	22.7	UJ	4.6	UJ	4.6	UJ	184	J	225	J	200		18	UJ
Aldrin	0.575	UJ	0.575	UJ	11.4	UJ	2.3	UJ	2.3	UJ	27.8	U	23.5	U	23.2	U	5.62	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SB06 2535-01		DA-S-SB07 0102-01		DA-S-SB08 0102-01		DA-S-SB08-0607-01		DA-S-MW-DUP07-01		DA-S-TP01 0001-01		DA-S-TP01 0304-01		DA-S-TP01 0607-01		DA-S-TP02 0001-01	
Sample Location	SB06		SB07		SB08		SB08		SB08		TP01		TP01		TP01		TP02	
Date Sampled	8/18/2003		8/18/2003		8/19/2003		8/19/2003		8/19/2003		8/11/2003		8/11/2003		8/11/2003		8/13/2003	
Interval	2.5-3.5		1.0-2.0		1.0-2.0		6.0-7.0		6.0-7.0		0.0-1.0		3.0-4.0		6.0-7.0		0.0-1.0	
QC Identifier	None		None		None		Field Dup. DA-S-SB08-0607-01		Field Dup. DA-S-SB08-0607-01		None		None		None		None	
alpha-BHC	0.575	UJ	0.575	UJ	11.4	UJ	2.3	UJ	2.3	UJ	27.8	U	23.5	U	23.2	U	5.62	U
alpha-Chlordane	0.69	UJ	0.69	UJ	11.4	UJ	2.3	UJ	2.3	UJ	33.3	U	28.2	U	27.9	U	6.74	U
Aroclor-1016	22.4	U	22.4	U	56.8	UJ	57.5	UJ	57.5	UJ	27.1	U	22.9	U	22.7	U	21.9	U
Aroclor-1016/1242	57.5	U	57.5	U	56.8	U	57.5	U	57.5	U	69.4	U	58.8	U	58.1	U	56.2	U
Aroclor-1221	22.4	U	22.4	U	56.8	UJ	57.5	UJ	57.5	UJ	27.1	U	22.9	U	22.7	U	21.9	U
Aroclor-1232	22.4	U	22.4	U	56.8	UJ	57.5	UJ	57.5	UJ	27.1	U	22.9	U	22.7	U	21.9	U
Aroclor-1242	22.4	U	22.4	U	56.8	UJ	57.5	UJ	57.5	UJ	27.1	U	22.9	U	22.7	U	21.9	U
Aroclor-1248	22.4	U	22.4	U	56.8	UJ	57.5	UJ	57.5	UJ	27.1	U	22.9	U	22.7	U	21.9	U
Aroclor-1254	22.4	U	22.4	U	56.8	UJ	57.5	UJ	57.5	UJ	152	J	22.9	UJ	22.7	UJ	21.9	U
Aroclor-1260	12.6	U	12.6	U	56.8	UJ	57.5	UJ	57.5	UJ	15.3	U	12.9	U	12.8	U	12.4	U
Aroclor-1268	22.4	U	22.4	U	56.8	UJ	57.5	UJ	57.5	UJ	134		96.7		27.4	J	21.9	U
beta-BHC	1.49	UJ	1.49	UJ	11.4	UJ	2.3	UJ	2.3	UJ	72.2	U	61.2	U	60.5	U	14.6	U
delta-BHC	0.575	UJ	0.575	UJ	11.4	UJ	2.3	UJ	2.3	UJ	27.8	U	23.5	U	23.2	U	5.62	U
Dieldrin	0.804	UJ	0.804	UJ	22.7	UJ	4.6	UJ	4.6	UJ	38.9	U	32.9	U	32.6	U	7.86	U
Endosulfan I	0.575	UJ	0.575	UJ	11.4	UJ	2.3	UJ	2.3	UJ	27.8	U	23.5	U	23.2	U	5.62	U
Endosulfan II	1.95	UJ	1.95	UJ	22.7	UJ	4.6	UJ	4.6	UJ	94.4	U	80	U	79.1	U	19.1	U
Endosulfan Sulfate	1.26	UJ	1.26	UJ	22.7	UJ	4.6	UJ	4.6	UJ	61.1	U	51.8	U	51.2	U	12.4	UJ
Endrin	0.92	UJ	0.92	UJ	22.7	UJ	4.6	UJ	4.6	UJ	44.4	U	37.6	U	37.2	U	8.99	U
Endrin Aldehyde	1.49	UJ	1.49	UJ	22.7	UJ	4.6	UJ	4.6	UJ	72.2	U	61.2	U	60.5	U	14.6	U
Endrin Ketone	1.03	UJ	1.03	UJ	22.7	UJ	4.6	UJ	4.6	UJ	50	U	42.4	U	41.9	U	10.1	UJ
gamma-BHC	0.575	UJ	0.575	UJ	11.4	UJ	2.3	UJ	2.3	UJ	27.8	U	23.5	U	23.2	U	5.62	U
gamma-Chlordane	0.575	UJ	0.575	UJ	11.4	UJ	2.3	UJ	2.3	UJ	27.8	U	23.5	U	23.2	U	5.62	U
Heptachlor	0.69	UJ	0.69	UJ	11.4	UJ	2.3	UJ	2.3	UJ	33.3	U	28.2	U	27.9	U	6.74	U
Heptachlor Epoxide	0.575	UJ	0.575	UJ	11.4	UJ	2.3	UJ	2.3	UJ	27.8	U	23.5	U	23.2	U	5.62	U
Hexachlorobenzene	23	UJ	23	UJ	114	UJ	23	UJ	23	UJ	1110	U	941	U	930	U	225	U
Methoxychlor	5.29	UJ	5.29	UJ	114	UJ	23	UJ	23	UJ	256	U	216	U	214	U	51.7	UJ
Toxaphene	46.4	UJ	46.4	UJ	284	UJ	57.5	UJ	57.5	UJ	2240	U	1900	U	1880	U	454	UJ
TAL Metal Analysis (MG/KG)																		
Aluminum	5400		5400		7800		11000		11000		9100		7300		7300		6400	J
Antimony	0.22	U	0.30	U	0.33	U	0.10	U	0.092	U	1.3		0.47	U	0.37	U	1.2	J
Arsenic	18.0	J	31.0	J	10.0		14.0		13.0		19.0	J	19.0	J	15.0	J	16.0	J
Barium	15.0		8.2		14.0		18.0		17.0		39.0		20.0		20.0		44.0	
Beryllium	0.36		0.33		0.36		0.38		0.37		0.33		0.27		0.30		0.20	U
Cadmium	0.018	UJ	0.018	UJ	0.018	U	0.018	U	0.018	U	11.0		2.8	J	1.3	J	0.34	J
Calcium	160		45.0		330		200		180		1400	J	1400	J	1700	J	2700	J
Chromium	7.7		8.1		19.0	J	22.0	J	22.0	J	26.0		11.0	J	9.8		9.0	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-SB06 2535-01		DA-S-SB07 0102-01		DA-S-SB08 0102-01		DA-S-SB08-0607-01		DA-S-MW-DUP07-01		DA-S-TP01 0001-01		DA-S-TP01 0304-01		DA-S-TP01 0607-01		DA-S-TP02 0001-01	
Sample Location	SB06		SB07		SB08		SB08		SB08		TP01		TP01		TP01		TP02	
Date Sampled	8/18/2003		8/18/2003		8/19/2003		8/19/2003		8/19/2003		8/11/2003		8/11/2003		8/11/2003		8/13/2003	
Interval	2.5-3.5		1.0-2.0		1.0-2.0		6.0-7.0		6.0-7.0		0.0-1.0		3.0-4.0		6.0-7.0		0.0-1.0	
QC Identifier	None		None		None		Field Dup. DA-S-SB08-0607-01		Field Dup. DA-S-SB08-0607-01		None		None		None		None	
Cobalt	11.0		14.0		8.6		13.0		13.0		17.0	J	12.0	J	13.0	J	16.0	
Copper	14.0		24.0		17.0		23.0		21.0		51.0		26.0		20.0		20.0	
Iron	20000		22000		18000		32000		32000		21000		23000		16000		18000	J
Lead	7.1		6.8		15.0		9.7		9.4		120		36.0		37.0		50.0	
Magnesium	1100		1400		2400	J	3500	J	3500	J	2500		2300		2000		2100	J
Manganese	480		310		200		300		290		300		340		280		270	
Mercury	0.0121		0.012		0.0107	J	0.00827	U	0.00849	U	0.14	J	0.087	J	0.055	J	0.030	
Molybdenum	0.49	U	0.47	U	0.42	U	0.44	U	0.36	U	0.84		0.26	U	0.29	U	0.29	U
Nickel	11.0		20.0		14.0		21.0		21.0		24.0		19.0		14.0		13.0	
Potassium	120		140		230		170		160		300		260		190		160	
Selenium	0.21	U	0.11	U	0.11	U	0.11	U	0.11	U	0.14	UJ	0.12	UJ	0.11	UJ	0.11	U
Silver	0.051	U	0.032	U	0.034	J	0.032	U	0.032	U	2.0		1.1		0.37	U	0.37	
Sodium	38.0	U	75.0	U	26.0	U	31.0	U	30.0	U	48.0	U	31.0	U	35.0	U	27.0	U
Thallium	0.23	J	0.16	U	0.16	U	0.16	U	0.16	U	0.97	U	0.81	U	0.80	U	0.78	U
Vanadium	12.0		9.8		12.0		16.0		17.0		18.0		15.0		17.0		15.0	
Zinc	29.0	J	40.0	J	33.0	J	46.0	J	46.0	J	120		88.0		59.0		64.0	J
Total Petroleum Hydrocarbon Analysis (UG/KG)																		
Diesel Range Organics	57000	U	57000	U	32000	J	57000	U	57000	U	63000	J	190000		110000		59000	
Gasoline Range Organics	580	U	4900	U	5500	J	470	J	570	J	27000		1800	J	810	J	470	J
Miscellaneous Analysis (%)																		
TOTAL SOLIDS	87.0		87.0			NA		NA	87.0		72.0		85.0		86.0		89.0	

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
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APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP02-0102-01		DA-S-TP02-0203-01		DA-S-TP-DUP02-01		DA-S-TP02 0506-01		DA-S-TP05 0001-01		DA-S-TP05 0607-01		DA-S-TP05-0910-01		DA-S-TP-DUP01-01		DA-S-TP06 0001-01	
Sample Location	TP02		TP02		TP02		TP02		TP05		TP05		TP05		TP05		TP06	
Date Sampled	8/13/2003		8/13/2003		8/13/2003		8/13/2003		8/11/2003		8/11/2003		8/11/2003		8/11/2003		8/13/2003	
Interval	1.0-2.0		2.0-3.0		2.0-3.0		5.0-6.0		0.0-1.0		6.0-7.0		9.0-10.0		9.0-10.0		0.0-1.0	
QC Identifier	None		Field Dup. DA-S-TP02-0203-01		Field Dup. DA-S-TP02-0203-01		None		None		None		Field Dup. DA-S-TP05-0910-01		Field Dup. DA-S-TP05-0910-01		None	
Volatile Organic Analysis (UG/KG)																		
1,1,1,2-Tetrachloroethane	10000	U	640	U	84	U	0.19	U	0.16	U	0.15	U	0.27	U	0.15	U	0.2	U
1,1,1-Trichloroethane	8000	U	510	U	68	U	0.38	U	0.33	U	0.31	U	0.56	U	0.31	U	0.42	U
1,1,2,2-Tetrachloroethane	9600	U	610	U	81	U	0.25	U	0.21	U	0.2	U	0.36	U	0.2	U	0.27	U
1,1,2-Trichloroethane	5200	U	330	U	44	U	0.27	U	0.23	U	0.22	U	0.4	U	0.22	U	0.3	U
1,1-Dichloroethane	6100	U	390	U	52	U	0.41	U	0.34	U	0.33	U	0.59	U	0.33	U	0.44	U
1,1-Dichloroethene	12000	U	780	U	100	U	0.5	U	0.42	U	0.4	U	0.72	U	0.4	U	0.54	U
1,1-Dichloropropene	11000	U	700	U	93	U	0.33	U	0.28	U	0.27	U	0.48	U	0.26	U	0.36	U
1,2,3-Trichlorobenzene	12000	U	790	U	100	U	0.22	U	0.19	U	0.18	U	0.32	U	0.18	U	0.24	U
1,2,3-Trichloropropane	7300	U	470	U	62	U	0.27	U	0.23	U	0.22	U	0.4	U	0.22	U	0.3	U
1,2,4-Trichlorobenzene	9000	U	570	U	76	U	0.31	U	0.26	U	0.26	U	0.45	U	0.25	U	0.34	U
1,2,4-Trimethylbenzene	8300	U	530	U	240	J	0.31	U	0.26	U	0.25	U	0.44	U	0.25	U	0.33	U
1,2-Dibromo-3-chloropropane	51000	U	3300	U	430	U	0.46	U	0.39	U	0.37	U	0.66	U	0.37	U	0.5	U
1,2-Dibromoethane	7300	U	470	U	62	U	0.084	U	0.071	U	0.068	U	0.12	U	0.067	U	0.09	U
1,2-Dichlorobenzene	5000	U	320	U	42	U	0.26	U	0.22	U	0.21	U	0.37	U	0.21	U	0.28	U
1,2-Dichloroethane	4500	U	290	U	38	U	0.23	U	0.19	U	0.19	U	0.33	U	0.18	U	0.25	U
1,2-Dichloropropane	7800	U	490	U	65	U	0.22	U	0.19	U	0.18	U	0.32	U	0.18	U	0.24	U
1,3,5-Trimethylbenzene	8800	U	560	U	74	U	0.26	U	0.22	U	0.21	U	0.38	U	0.21	U	0.28	U
1,3-Dichlorobenzene	6400	U	410	U	54	U	0.23	U	0.19	U	0.18	U	0.33	U	0.18	U	0.24	U
1,3-Dichloropropane	5600	U	360	U	48	U	0.34	U	0.28	U	0.27	U	0.49	U	0.27	U	0.36	U
1,4-Dichlorobenzene	7600	U	480	U	64	U	0.19	U	0.16	U	0.15	U	0.27	U	0.15	U	0.2	U
2,2-Dichloropropane	20000	U	1300	U	170	U	0.39	U	0.33	U	0.32	U	0.57	U	0.32	U	0.42	U
2-Butanone	54000	U	3400	U	460	U	0.39	U	0.33	U	0.32	U	0.56	U	0.31	U	0.42	U
2-Chlorotoluene	7700	U	490	U	65	U	0.35	U	0.29	U	0.28	U	0.5	U	0.28	U	0.37	U
2-Hexanone	59000	U	3700	U	490	U	0.3	U	0.26	U	0.25	U	0.44	U	0.24	U	0.33	U
4-Chlorotoluene	7900	U	500	U	67	U	0.35	U	0.3	U	0.29	U	0.51	U	0.28	U	0.38	U
4-Methyl-2-Pentanone	13000	U	830	U	110	U	0.51	U	0.44	U	0.42	U	0.74	U	0.41	U	0.55	U
Acetone	48000	U	3100	U	410	U	6.4	U	5.4	U	5.2	U	9.3	U	5.2	U	6.9	U
Benzene	9600	U	610	U	80	U	0.28	U	0.23	U	0.22	U	0.4	U	0.22	U	0.3	U
Bromobenzene	4800	U	310	U	41	U	0.35	U	0.3	U	0.29	U	0.51	U	0.28	U	0.38	U
Bromochloromethane	6300	U	400	U	53	U	0.24	U	0.2	U	0.19	U	0.34	U	0.19	U	0.26	U
Bromodichloromethane	7800	U	500	U	66	U	0.34	U	0.29	U	0.28	U	0.5	U	0.28	U	0.37	U
Bromoform	36000	U	2300	U	300	U	0.25	U	0.21	U	0.2	U	0.36	U	0.2	U	0.26	U
Bromomethane	12000	U	740	U	98	U	1.4	U	1.2	U	1.2	U	2.1	U	1.1	U	1.5	U
Carbon Disulfide	8900	U	570	U	75	U	0.42	U	0.35	U	0.34	U	0.6	U	0.33	U	0.45	U
Carbon Tetrachloride	12000	U	780	U	100	U	0.46	U	0.39	U	0.38	U	0.67	U	0.37	U	0.5	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP02-0102-01		DA-S-TP02-0203-01		DA-S-TP-DUP02-01		DA-S-TP02-0506-01		DA-S-TP05-0001-01		DA-S-TP05-0607-01		DA-S-TP05-0910-01		DA-S-TP-DUP01-01		DA-S-TP06-0001-01	
Sample Location	TP02		TP02		TP02		TP02		TP05		TP05		TP05		TP05		TP06	
Date Sampled	8/13/2003		8/13/2003		8/13/2003		8/13/2003		8/11/2003		8/11/2003		8/11/2003		8/11/2003		8/13/2003	
Interval	1.0-2.0		2.0-3.0		2.0-3.0		5.0-6.0		0.0-1.0		6.0-7.0		9.0-10.0		9.0-10.0		0.0-1.0	
QC Identifier	None		Field Dup. DA-S-TP02-0203-01		Field Dup. DA-S-TP02-0203-01		None		None		None		Field Dup. DA-S-TP05-0910-01		Field Dup. DA-S-TP05-0910-01		None	
Chlorobenzene	10000	U	660	U	87	U	0.29	U	0.24	U	0.24	U	0.42	U	0.23	U	0.31	U
Chloroethane	12000	U	740	U	98	U	0.28	U	0.24	U	0.23	U	0.41	U	0.23	U	0.31	U
Chloroform	4500	U	280	U	38	U	0.33	U	0.28	U	0.27	U	0.48	U	0.27	U	0.36	U
Chloromethane	3800	U	240	U	32	U	0.51	U	0.43	U	0.41	U	0.74	U	0.41	U	0.55	U
cis-1,2-Dichloroethene	6000	U	380	U	50	U	0.37	U	0.32	U	0.3	U	0.54	U	0.3	U	0.4	U
cis-1,3-Dichloropropene	4100	U	260	U	35	U	0.21	U	0.18	U	0.17	U	0.31	U	0.17	U	0.23	U
Dibromochloromethane	6200	U	390	U	52	U	0.24	U	0.2	U	0.2	U	0.35	U	0.19	U	0.26	U
Dibromomethane	6300	U	400	U	53	U	0.44	U	0.37	U	0.36	U	0.64	U	0.35	U	0.48	U
Dichlorodifluoromethane	9800	U	620	U	83	U	0.44	U	0.38	U	0.36	U	0.64	U	0.36	U	0.48	U
Ethylbenzene	9100	U	580	U	76	U	0.34	U	0.29	U	0.28	U	0.49	U	0.27	U	0.36	U
Hexachlorobutadiene	14000	U	900	U	120	U	0.3	U	0.26	U	0.24	U	0.44	U	0.24	U	0.32	U
Isopropylbenzene	8500	U	540	U	71	U	0.37	U	0.32	U	0.3	U	0.54	U	0.3	U	0.4	U
m&p-Xylene	12000	U	800	U	130	J	0.72	U	0.79	J	0.59	U	1	U	0.58	U	0.78	U
Methyl tert-Butyl Ether	3800	U	240	U	32	U	0.37	U	0.32	U	0.3	U	0.54	U	0.3	U	0.4	U
Methylene Chloride	12000	U	1300	J	100	UJ	6.8	U	5.8	U	5.5	U	9.8	U	5.5	U	7.3	U
Naphthalene	1400000		94000	J	16000	J	9.2	U	4.1	U	4	U	7.1	U	3.9	U	5.3	U
n-Butylbenzene	13000	U	850	U	110	U	0.37	U	0.31	U	0.3	U	0.53	U	0.3	U	0.4	U
n-Propylbenzene	10000	U	670	U	88	U	0.34	U	0.28	U	0.27	U	0.48	U	0.27	U	0.36	U
o-Xylene	9900	U	630	U	84	U	0.58	U	0.49	U	0.48	U	0.84	U	0.47	U	0.63	U
p-Isopropyltoluene	11000	U	690	U	160		0.32	U	0.27	U	0.26	U	0.46	U	0.26	U	0.35	U
sec-Butylbenzene	13000	U	830	U	110	U	0.32	U	0.28	U	0.26	U	0.47	U	0.26	U	0.35	U
Styrene	14000	U	920	U	120	U	0.6	U	0.51	U	0.49	U	0.87	U	0.48	U	0.65	U
tert-Butylbenzene	9400	U	600	U	80	U	0.34	U	0.28	U	0.27	U	0.49	U	0.27	U	0.36	U
Tetrachloroethene	14000	U	890	U	120	U	0.32	U	0.28	U	0.26	U	0.47	U	0.26	U	0.35	U
Toluene	10000	U	650	U	90	J	0.28	U	0.24	U	0.23	U	0.41	U	0.23	U	0.31	U
trans-1,2-Dichloroethene	11000	U	710	U	94	U	0.31	U	0.26	U	0.25	U	0.45	U	0.25	U	0.33	U
trans-1,3-Dichloropropene	7800	U	500	U	66	U	0.19	U	0.16	U	0.15	U	0.27	U	0.15	U	0.2	U
Trichloroethene	11000	U	700	U	92	U	0.36	U	0.3	U	0.29	U	0.52	U	0.29	U	0.39	U
Trichlorofluoromethane	9400	U	600	U	80	U	0.4	U	0.34	U	0.32	U	0.57	U	0.32	U	0.43	U
Vinyl Chloride	8800	U	560	U	74	U	0.54	U	0.46	U	0.44	U	0.78	U	0.44	U	0.58	U
Semivolatile Organic Analysis (UG/KG)																		
1,2,4-Trichlorobenzene	63000	U	1400	U	1800	U	70	UJ	71	U	70	U	80	U	80	U	75	U
1,2-Dichlorobenzene	61000	U	1400	U	1700	U	68	UJ	69	U	68	U	78	U	78	U	72	U
1,2-Diphenylhydrazine	56000	U	1300	U	1600	U	63	UJ	64	U	63	U	72	U	72	U	66	U
1,3-Dichlorobenzene	63000	U	1400	U	1800	U	70	UJ	71	U	70	U	80	U	80	U	75	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP02-0102-01		DA-S-TP02-0203-01		DA-S-TP-DUP02-01		DA-S-TP02 0506-01		DA-S-TP05 0001-01		DA-S-TP05 0607-01		DA-S-TP05-0910-01		DA-S-TP-DUP01-01		DA-S-TP06 0001-01	
Sample Location	TP02		TP02		TP02		TP02		TP05		TP05		TP05		TP05		TP06	
Date Sampled	8/13/2003		8/13/2003		8/13/2003		8/13/2003		8/11/2003		8/11/2003		8/11/2003		8/11/2003		8/13/2003	
Interval	1.0-2.0		2.0-3.0		2.0-3.0		5.0-6.0		0.0-1.0		6.0-7.0		9.0-10.0		9.0-10.0		0.0-1.0	
QC Identifier	None		Field Dup. DA-S-TP02-0203-01		Field Dup. DA-S-TP02-0203-01		None		None		None		Field Dup. DA-S-TP05-0910-01		Field Dup. DA-S-TP05-0910-01		None	
1,4-Dichlorobenzene	67000	U	1500	U	1900	U	76	UJ	76	U	76	U	86	U	86	U	80	U
2,2'-oxybis(1-Chloropropane)	53000	U	1200	U	1500	U	60	UJ	60	U	60	U	68	U	68	U	63	U
2,4,5-Trichlorophenol	110000	U	2500	U	3200	U	120	UJ	130	U	120	UJ	140	U	140	U	130	U
2,4,6-Trichlorophenol	190000	U	4200	U	5300	U	210	UJ	210	U	210	UJ	240	U	240	U	220	U
2,4-Dichlorophenol	130000	U	3000	U	3700	U	150	UJ	150	U	150	UJ	170	U	170	U	150	U
2,4-Dimethylphenol	460000	U	10000	U	13000	U	510	J	520	U	510	UJ	580	U	580	U	540	U
2,4-Dinitrophenol	120000	U	2800	U	3500	U	140	UJ	140	U	140	UJ	160	U	160	U	150	U
2,4-Dinitrotoluene	60000	U	1400	U	1700	U	67	UJ	68	U	67	U	77	U	77	U	71	U
2,6-Dichlorophenol	110000	U	2500	U	3200	U	120	UJ	130	U	120	UJ	140	U	140	U	130	U
2,6-Dinitrotoluene	70000	U	1600	U	2000	U	78	UJ	79	U	78	U	89	U	89	U	83	U
2-Chloronaphthalene	57000	U	1300	U	1600	U	64	UJ	64	U	64	U	73	U	73	U	68	U
2-Chlorophenol	120000	U	2600	U	3300	U	130	UJ	130	U	130	UJ	150	U	150	U	140	U
2-Methylnaphthalene	390000	J	4300	U	5300	U	210	UJ	210	U	210	U	240	U	240	U	220	U
2-Methylphenol	150000	U	3300	U	4200	U	160	UJ	170	U	160	UJ	190	U	190	U	180	U
2-Nitroaniline	130000	U	2900	U	3600	U	140	UJ	140	U	140	U	160	U	160	U	150	U
2-Nitrophenol	140000	U	3200	U	4100	U	160	UJ	160	U	160	UJ	180	U	180	U	170	U
3,3'-Dichlorobenzidine	89000	U	2000	U	2500	U	100	UJ	100	U	100	U	110	U	110	U	110	U
3+4-Methylphenols	160000	U	3600	U	4500	U	180	UJ	180	U	180	UJ	200	U	200	U	190	U
3-Methylphenol	600000	U	14000	U	17000	U	670	U	680	U	670	U	770	U	770	U	710	U
3-Nitroaniline	90000	U	2000	U	2600	U	100	UJ	100	U	100	U	120	U	120	U	110	U
4,6-Dinitro-2-methylphenol	100000	U	2300	U	2900	U	110	UJ	120	U	110	UJ	130	U	130	U	120	U
4-Bromophenyl-phenylether	43000	U	980	U	1200	U	48	UJ	49	U	48	U	55	U	55	U	51	U
4-Chloro-3-methylphenol	170000	U	3800	U	4700	U	190	UJ	190	U	190	UJ	210	U	210	U	200	U
4-Chloroaniline	190000	U	4300	U	5400	U	210	UJ	210	U	210	U	240	U	240	U	220	U
4-Chlorophenyl-phenylether	62000	U	1400	U	1800	U	69	UJ	70	U	69	U	79	U	79	U	73	U
4-Nitroaniline	170000	U	3800	U	4700	U	190	UJ	190	U	190	U	210	U	210	U	200	U
4-Nitrophenol	210000	U	4700	U	5900	U	230	UJ	240	U	230	UJ	260	U	260	U	250	U
Acenaphthene	1400000		7600	J	9400	J	160	J	66	U	65	U	74	U	74	U	69	U
Acenaphthylene	76000	U	1700	U	2200	U	85	UJ	86	U	85	U	97	U	97	U	90	U
Anthracene	1300000		8800	J	12000	J	260	J	160	J	42	U	48	U	48	U	52	J
Benzidine	3400000	UJ	78000	UJ	97000	UJ	3800	UJ	3900	U	3800	U	4400	U	4400	U	4100	UJ
Benzo(a)anthracene	1700000		15000		20000		750	J	590		78	U	88	U	88	U	170	J
Benzo(a)pyrene	1400000		12000		15000		510	J	460	J	80	U	91	U	91	U	120	J
Benzo(b)fluoranthene	1200000		10000	J	13000	J	510	J	460	J	100	U	110	U	110	U	140	J
Benzo(g,h,i)perylene	800000		7600	J	9000	J	370	J	330	J	120	U	130	U	130	U	120	U
Benzo(k)fluoranthene	1100000		9900	J	13000	J	560	J	470	J	75	U	86	U	86	U	130	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP02-0102-01		DA-S-TP02-0203-01		DA-S-TP-DUP02-01		DA-S-TP02 0506-01		DA-S-TP05 0001-01		DA-S-TP05 0607-01		DA-S-TP05-0910-01		DA-S-TP-DUP01-01		DA-S-TP06 0001-01	
Sample Location	TP02		TP02		TP02		TP02		TP05		TP05		TP05		TP05		TP06	
Date Sampled	8/13/2003		8/13/2003		8/13/2003		8/13/2003		8/11/2003		8/11/2003		8/11/2003		8/11/2003		8/13/2003	
Interval	1.0-2.0		2.0-3.0		2.0-3.0		5.0-6.0		0.0-1.0		6.0-7.0		9.0-10.0		9.0-10.0		0.0-1.0	
QC Identifier	None		Field Dup. DA-S-TP02-0203-01		Field Dup. DA-S-TP02-0203-01		None		None		None		Field Dup. DA-S-TP05-0910-01		Field Dup. DA-S-TP05-0910-01		None	
Benzoic acid	200000	U	4600	UJ	5700	UJ	220	UJ	230	U	220	U	260	U	260	U	240	UJ
Benzyl Alcohol	160000	U	3800	UJ	4700	UJ	180	UJ	190	U	180	U	210	U	210	U	200	UJ
Bis(2-Chloroethoxy)methane	70000	U	1600	U	2000	U	79	UJ	80	U	79	U	90	U	90	U	83	U
Bis(2-Chloroethyl)ether	64000	U	1400	U	1800	U	72	UJ	73	U	72	U	82	U	82	U	76	U
bis(2-Ethylhexyl)phthalate	98000	U	2200	U	2800	U	400	J	530	J	410	J	470	J	470	J	460	J
Butylbenzylphthalate	92000	U	2100	U	2600	U	100	UJ	100	U	100	U	120	U	120	U	110	U
Carbazole	770000		5300	J	7400	J	250	J	76	U	75	U	85	U	85	U	79	U
Chrysene	1500000		14000		18000		720	J	610		80	U	91	U	91	U	180	J
Dibenzo(a,h)anthracene	210000	J	2800	U	3600	U	140	UJ	140	U	140	U	160	U	160	U	150	U
Dibenzofuran	620000		2400	U	3700	J	120	UJ	120	U	120	U	130	U	130	U	120	U
Diethylphthalate	150000	J	1400	U	1700	U	180	J	68	U	67	U	77	U	77	U	71	U
Dimethylphthalate	59000	U	1300	U	1700	U	66	UJ	67	U	66	U	75	U	75	U	70	U
Di-n-Butylphthalate	67000	U	1500	U	1900	U	75	UJ	76	U	75	U	86	U	86	U	80	U
Di-n-octylphthalate	120000	U	2700	U	3400	U	130	UJ	140	U	130	U	150	U	150	U	140	U
Fluoranthene	4500000		37000		50000		1800	J	1300		65	U	74	U	74	U	370	J
Fluorene	920000		5400	J	7500	J	120	J	70	J	65	U	74	U	74	U	68	U
Hexachlorobenzene	48000	U	1100	U	1300	U	53	UJ	54	U	53	U	61	U	61	U	56	U
Hexachlorobutadiene	88000	U	2000	U	2500	U	99	UJ	100	U	99	U	110	U	110	U	100	U
Hexachloroethane	69000	U	1600	U	2000	U	78	UJ	79	U	78	U	89	U	89	U	83	U
Indeno(1,2,3-cd)pyrene	820000		7400	J	9200	J	360	J	290	J	150	U	180	U	180	U	160	U
Isophorone	70000	U	1600	U	2000	U	78	UJ	79	U	78	U	89	U	89	U	83	U
Naphthalene	1900000		4600	J	4600	J	180	J	84	U	83	U	94	U	94	U	88	U
Nitrobenzene	91000	U	2100	U	2600	U	100	UJ	100	U	100	U	120	U	120	U	110	U
N-nitrosodimethylamine	60000	U	1400	U	1700	U	68	UJ	68	U	68	U	77	U	77	U	72	U
N-Nitroso-di-n-propylamine	59000	U	1400	U	1700	U	67	UJ	68	U	67	U	76	U	76	U	71	U
N-Nitroso-diphenylamine	85000	U	1900	U	2400	U	96	UJ	97	U	96	U	110	U	110	U	100	U
N-nitrosopyrrolidine	85000	U	1900	U	2400	U	96	UJ	97	U	96	U	110	U	110	U	100	U
Pentachlorophenol	340000	U	7800	U	9800	U	390	UJ	390	U	390	UJ	440	U	440	U	410	U
Phenanthrene	4700000		34000		46000		1200	J	790		65	U	74	U	74	U	230	J
Phenol	93000	U	2100	U	2600	U	100	UJ	110	U	100	UJ	120	U	120	U	110	U
Pyrene	3600000		29000		39000		1400	J	1100		70	U	80	U	80	U	310	J
Pesticide/PCB Analysis (UG/KG)																		
4,4'-DDD	45	U	193	U	20.4	U	10.1	U	38.6	U	1.01	UJ	8.72	UJ	8.72	UJ	20.2	U
4,4'-DDE	95	U	90.9	U	43.2	U	21.3	U	18.2	U	2.13	UJ	4.1	UJ	4.1	UJ	9.52	U
4,4'-DDT	55	U	182	U	25	U	12.4	U	36.4	U	1.24	UJ	8.2	UJ	8.2	UJ	19	UJ
Aldrin	30	U	56.8	U	13.6	U	6.74	U	11.4	U	0.674	UJ	2.56	UJ	2.56	UJ	5.95	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP02-0102-01		DA-S-TP02-0203-01		DA-S-TP-DUP02-01		DA-S-TP02-0506-01		DA-S-TP05-0001-01		DA-S-TP05-0607-01		DA-S-TP05-0910-01		DA-S-TP-DUP01-01		DA-S-TP06-0001-01	
Sample Location	TP02		TP02		TP02		TP02		TP05		TP05		TP05		TP05		TP06	
Date Sampled	8/13/2003		8/13/2003		8/13/2003		8/13/2003		8/11/2003		8/11/2003		8/11/2003		8/11/2003		8/13/2003	
Interval	1.0-2.0		2.0-3.0		2.0-3.0		5.0-6.0		0.0-1.0		6.0-7.0		9.0-10.0		9.0-10.0		0.0-1.0	
QC Identifier	None		Field Dup. DA-S-TP02-0203-01		Field Dup. DA-S-TP02-0203-01		None		None		None		Field Dup. DA-S-TP05-0910-01		Field Dup. DA-S-TP05-0910-01		None	
alpha-BHC	35	U	56.8	U	15.9	U	7.86	U	11.4	U	0.786	UJ	2.56	UJ	2.56	UJ	5.95	U
alpha-Chlordane	25	U	68.2	U	11.4	U	5.62	U	13.6	U	0.562	UJ	3.08	UJ	3.08	UJ	7.14	U
Aroclor-1016	390	U	222	U	222	U	219	U	22.2	U	21.9	U	25	U	25	U	23.2	U
Aroclor-1016/1242	1000	U	568	U	568	U	562	U	56.8	U	56.2	U	64.1	U	64.1	U	59.5	U
Aroclor-1221	390	U	222	U	222	U	219	U	22.2	U	21.9	U	25	U	25	U	23.2	U
Aroclor-1232	390	U	222	U	222	U	219	U	22.2	U	21.9	U	25	U	25	U	23.2	U
Aroclor-1242	390	U	222	U	222	U	219	U	22.2	U	21.9	U	25	U	25	U	23.2	U
Aroclor-1248	390	U	222	U	222	U	219	U	22.2	U	21.9	U	25	U	25	U	23.2	U
Aroclor-1254	390	U	222	U	222	U	219	U	22.2	UJ	21.9	UJ	25	UJ	25	U	23.2	U
Aroclor-1260	220	U	125	U	125	U	124	U	94.8		12.4	U	14.1	U	14.1	U	13.1	U
Aroclor-1268	390	U	222	U	222	U	219	U	22.2	U	21.9	U	25	U	25	U	23.2	U
beta-BHC	55	U	148	U	25	U	12.4	U	29.5	U	1.24	UJ	6.67	UJ	6.67	UJ	15.5	U
delta-BHC	85	U	56.8	U	38.6	U	19.1	U	11.4	U	1.91	UJ	2.56	UJ	2.56	UJ	5.95	U
Dieldrin	95	U	79.5	U	43.2	U	21.3	U	15.9	U	2.13	UJ	3.59	UJ	3.59	UJ	8.33	U
Endosulfan I	25	U	56.8	U	11.4	U	5.62	U	11.4	U	0.562	UJ	2.56	UJ	2.56	UJ	5.95	U
Endosulfan II	50	U	193	U	22.7	U	11.2	U	38.6	U	1.12	UJ	8.72	UJ	8.72	UJ	20.2	U
Endosulfan Sulfate	45	U	125	U	20.4	U	10.1	U	25	U	1.01	UJ	5.64	UJ	5.64	UJ	13.1	UJ
Endrin	45	U	90.9	U	20.4	U	10.1	U	18.2	U	1.01	UJ	4.1	UJ	4.1	UJ	9.52	U
Endrin Aldehyde	70	U	148	U	31.8	U	15.7	U	29.5	U	1.57	UJ	6.67	UJ	6.67	UJ	15.5	U
Endrin Ketone	50	U	102	U	22.7	U	11.2	U	20.4	U	1.12	UJ	4.62	UJ	4.62	UJ	10.7	UJ
gamma-BHC	50	U	56.8	U	22.7	U	11.2	U	11.4	U	1.12	UJ	2.56	UJ	2.56	UJ	5.95	U
gamma-Chlordane	50	U	56.8	U	22.7	U	11.2	U	11.4	U	1.12	UJ	2.56	UJ	2.56	UJ	5.95	U
Heptachlor	75	U	68.2	U	34.1	U	16.8	U	13.6	U	1.68	UJ	3.08	UJ	3.08	UJ	7.14	U
Heptachlor Epoxide	30	U	56.8	U	13.6	U	6.74	U	11.4	U	0.674	UJ	2.56	UJ	2.56	UJ	5.95	U
Hexachlorobenzene	1000	U	2270	U	454	U	225	U	454	U	22.5	UJ	102	UJ	102	UJ	238	U
Methoxychlor	230	U	523	U	104	U	51.7	U	104	U	5.17	UJ	23.6	UJ	23.6	UJ	54.8	UJ
Toxaphene	1900	U	4590	U	864	U	427	U	918	U	42.7	UJ	207	UJ	207	UJ	481	UJ
TAL Metal Analysis (MG/KG)																		
Aluminum	37.0	J	8200	J	9400	J	9000	J	7000		6700		12000		11000		9500	
Antimony	0.080	U	0.30	U	0.41	U	0.27	U	0.33	U	0.26	U	0.16	U	0.15	U	0.45	U
Arsenic	0.19	J	27.0	J	27.0	J	22.0	J	13.0	J	26.0	J	14.0	J	14.0	J	18.0	J
Barium	0.18	U	15.0		16.0		18.0		17.0		22.0		12.0		11.0		17.0	
Beryllium	0.024	U	0.31	J	0.33	J	0.31	J	0.34		0.32		0.25		0.25		0.23	J
Cadmium	0.016	U	0.28	J	0.24	U	0.17	U	0.92	J	0.17	J	0.21	J	0.16	J	0.24	U
Calcium	13.0	U	1300	J	2200	J	590	J	800	J	220	J	950	J	870	J	1400	J
Chromium	0.24	J	11.0	J	12.0	J	12.0	J	9.3	J	8.6	J	14.0	J	13.0	J	13.0	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP02-0102-01		DA-S-TP02-0203-01		DA-S-TP-DUP02-01		DA-S-TP02 0506-01		DA-S-TP05 0001-01		DA-S-TP05 0607-01		DA-S-TP05-0910-01		DA-S-TP-DUP01-01		DA-S-TP06 0001-01	
Sample Location	TP02		TP02		TP02		TP02		TP05		TP05		TP05		TP05		TP06	
Date Sampled	8/13/2003		8/13/2003		8/13/2003		8/13/2003		8/11/2003		8/11/2003		8/11/2003		8/11/2003		8/13/2003	
Interval	1.0-2.0		2.0-3.0		2.0-3.0		5.0-6.0		0.0-1.0		6.0-7.0		9.0-10.0		9.0-10.0		0.0-1.0	
QC Identifier	None		Field Dup. DA-S-TP02-0203-01		Field Dup. DA-S-TP02-0203-01		None		None		None		Field Dup. DA-S-TP05-0910-01		Field Dup. DA-S-TP05-0910-01		None	
Cobalt	0.36		15.0		18.0		17.0		9.2	J	19.0	J	18.0	J	16.0	J	8.3	
Copper	0.64		22.0		26.0		26.0		24.0		31.0		28.0		25.0		19.0	
Iron	920	J	29000	J	35000	J	33000	J	24000		28000		30000		29000		24000	J
Lead	1.8		16.0		17.0		12.0		22.0		9.6		18.0		19.0		26.0	
Magnesium	21.0	J	2500	J	2900	J	3100	J	2200		2200		4200		3800		3200	J
Manganese	4.6		420		420		670		380		2700		660		590		240	
Mercury	0.0071	U	0.022		0.022		0.0070	U	0.084	J	0.0089	J	0.021	J	0.019	J	0.072	
Molybdenum	0.052	U	0.28	U	0.27	U	0.36	U	0.44		0.30	U	0.32	U	0.27	U	0.39	U
Nickel	0.39		20.0		22.0		26.0		15.0		27.0		26.0		23.0		17.0	
Potassium	4.0	U	130		160		170		240		150		120		130		180	
Selenium	0.099	U	0.11	U	0.56	U	0.56	U	0.11	UJ	0.56	U	0.13	UJ	0.13	UJ	0.12	U
Silver	0.028	U	0.061	U	0.057	U	0.035	U	0.094	U	0.22	U	0.052	U	0.064	U	0.054	U
Sodium	5.2	U	23.0	U	34.0	U	23.0	U	29.0	U	23.0	U	26.0	U	25.0	U	26.0	U
Thallium	0.14	U	0.79	U	0.78	U	0.78	U	0.79	U	0.89	J	0.89	U	0.89	U	0.83	U
Vanadium	0.099	U	14.0		16.0		15.0		14.0		12.0		16.0		16.0		18.0	
Zinc	2.2	J	54.0	J	57.0	J	58.0	J	71.0		50.0		57.0		54.0		65.0	J
Total Petroleum Hydrocarbon Analysis (UG/KG)																		
Diesel Range Organics	390000000		3100000	J	990000	J	46000	J	52000	J	16000	U	18000	U	18000	U	20000	J
Gasoline Range Organics	100000		71000	J	16000	J	3400	J	560	J	1100	J	1200	J	710	J	1600	J
Miscellaneous Analysis (%)																		
TOTAL SOLIDS		NA	88.0		88.0		89.0		88.0		89.0		78.0		78.0		84.0	

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP06 0304-01		DA-S-TP06 0910-01		DA-S-TP07 0001-01		DA-S-TP07 0304-01		DA-S-TP07 0910-01		DA-S-TP08 0001-01		DA-S-TP08- 0304-01		DA-S-TP- DUP05-01		DA-S-TP08 0708-01		DA-S-TP09 0001-01
Sample Location	TP06		TP06		TP07		TP07		TP07		TP08		TP08		TP08		TP08		TP09
Date Sampled	8/13/2003		8/13/2003		8/12/2003		8/12/2003		8/12/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/14/2003
Interval	3.0-4.0		9.0-10.0		0.0-1.0		3.0-4.0		9.0-10.0		0.0-1.0		3.0-4.0		3.0-4.0		7.0-8.0		0.0-1.0
QC Identifier	None		None		None		None		None		None		Field Dup. DA-S-TP08-0304-01		Field Dup. DA-S-TP08-0304-01		None		None
Volatile Organic Analysis (UG/KG)																			
1,1,1,2-Tetrachloroethane	0.15	U	0.2	U	0.18	U	0.16	U	0.22	U	0.16	U	0.16	U	0.21	U	0.14	U	0.2
1,1,1-Trichloroethane	0.31	U	0.42	U	0.37	U	0.33	U	0.44	U	0.33	U	0.32	U	0.43	U	0.3	U	0.42
1,1,2,2-Tetrachloroethane	0.2	U	0.27	U	0.24	U	0.21	U	0.29	U	0.22	U	0.21	U	0.28	U	0.19	U	0.27
1,1,2-Trichloroethane	0.22	U	0.3	U	0.26	U	0.23	U	0.31	U	0.24	U	0.23	U	0.31	U	0.21	U	0.3
1,1-Dichloroethane	0.33	U	0.44	U	0.39	U	0.35	U	0.46	U	0.35	U	0.34	U	0.46	U	0.31	U	0.44
1,1-Dichloroethene	0.4	U	0.54	U	0.47	U	0.42	U	0.57	U	0.43	U	0.42	U	0.56	U	0.38	U	0.54
1,1-Dichloropropene	0.27	U	0.36	U	0.32	U	0.28	U	0.38	U	0.29	U	0.28	U	0.37	U	0.26	U	0.36
1,2,3-Trichlorobenzene	0.18	U	0.24	U	0.21	U	0.19	U	0.25	U	0.19	U	0.18	U	0.25	U	0.17	U	0.24
1,2,3-Trichloropropane	0.22	U	0.3	U	0.26	U	0.23	U	0.31	U	0.24	U	0.23	U	0.31	U	0.21	U	0.3
1,2,4-Trichlorobenzene	0.26	U	0.34	U	0.3	U	0.27	U	0.36	U	0.27	U	0.26	U	0.35	U	0.24	U	0.34
1,2,4-Trimethylbenzene	0.25	U	0.33	U	0.29	U	0.26	U	0.35	U	0.26	U	0.26	U	0.35	U	0.24	U	0.33
1,2-Dibromo-3-chloropropane	0.37	U	0.5	U	0.44	U	0.39	U	0.53	U	0.4	U	0.39	U	0.52	U	0.36	U	0.5
1,2-Dibromoethane	0.068	U	0.091	U	0.08	U	0.072	U	0.096	U	0.072	U	0.07	U	0.094	U	0.065	U	0.091
1,2-Dichlorobenzene	0.21	U	0.28	U	0.24	U	0.22	U	0.3	U	0.22	U	0.22	U	0.29	U	0.2	U	0.28
1,2-Dichloroethane	0.19	U	0.25	U	0.22	U	0.2	U	0.26	U	0.2	U	0.19	U	0.26	U	0.18	U	0.25
1,2-Dichloropropane	0.18	U	0.24	U	0.21	U	0.19	U	0.25	U	0.19	U	0.18	U	0.25	U	0.17	U	0.24
1,3,5-Trimethylbenzene	0.21	U	0.28	U	0.25	U	0.22	U	0.3	U	0.22	U	0.22	U	0.29	U	0.2	U	0.28
1,3-Dichlorobenzene	0.18	U	0.25	U	0.22	U	0.19	U	0.26	U	0.2	U	0.19	U	0.26	U	0.18	U	0.24
1,3-Dichloropropane	0.28	U	0.37	U	0.32	U	0.29	U	0.39	U	0.29	U	0.28	U	0.38	U	0.26	U	0.36
1,4-Dichlorobenzene	0.15	U	0.2	U	0.18	U	0.16	U	0.22	U	0.16	U	0.16	U	0.21	U	0.14	U	0.2
2,2-Dichloropropane	0.32	U	0.43	U	0.38	U	0.34	U	0.45	U	0.34	U	0.33	U	0.44	U	0.3	U	0.43
2-Butanone	0.32	U	0.42	U	0.37	U	0.33	U	0.44	U	0.34	U	0.33	U	0.44	U	0.3	U	2.8
2-Chlorotoluene	0.28	U	0.38	U	0.33	U	0.3	U	0.4	U	0.3	U	0.29	U	0.39	U	0.27	U	0.38
2-Hexanone	0.25	U	0.33	U	0.29	U	0.26	U	0.35	U	0.26	U	0.26	U	0.34	U	0.24	U	0.33
4-Chlorotoluene	0.29	U	0.38	U	0.34	U	0.3	U	0.4	U	0.3	U	0.3	U	0.4	U	0.27	U	0.38
4-Methyl-2-Pentanone	0.42	U	0.56	U	0.49	U	0.44	U	0.59	U	0.44	U	0.43	U	0.58	U	0.4	U	0.56
Acetone	5.2	U	7	U	6.1	U	5.5	U	7.4	U	5.6	U	5.4	U	7.2	U	5	U	66
Benzene	0.22	U	0.3	U	0.26	U	0.24	U	0.32	U	0.24	U	0.23	U	0.31	U	0.21	U	0.3
Bromobenzene	0.29	U	0.38	U	0.34	U	0.3	U	0.41	U	0.31	U	0.3	U	0.4	U	0.28	U	0.38
Bromochloromethane	0.19	U	0.26	U	0.22	U	0.2	U	0.27	U	0.2	U	0.2	U	0.27	U	0.18	U	0.26
Bromodichloromethane	0.28	U	0.37	U	0.33	U	0.29	U	0.39	U	0.3	U	0.29	U	0.39	U	0.26	U	0.37
Bromoform	0.2	U	0.27	U	0.23	U	0.21	U	0.28	U	0.21	U	0.21	U	0.28	U	0.19	U	0.27
Bromomethane	1.2	U	1.6	U	1.4	U	1.2	U	1.6	U	1.2	U	1.2	U	1.6	U	1.1	U	1.5
Carbon Disulfide	0.34	U	0.45	U	0.4	U	0.36	U	0.48	U	0.36	U	0.35	U	0.47	U	0.32	U	0.45
Carbon Tetrachloride	0.38	U	0.5	U	0.44	U	0.39	U	0.53	U	0.4	U	0.39	U	0.52	U	0.36	U	0.5

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

Sample Number	DA-S-TP06 0304-01		DA-S-TP06 0910-01		DA-S-TP07 0001-01		DA-S-TP07 0304-01		DA-S-TP07 0910-01		DA-S-TP08 0001-01		DA-S-TP08- 0304-01		DA-S-TP- DUP05-01		DA-S-TP08 0708-01		DA-S-TP09 0001-01
Sample Location	TP06		TP06		TP07		TP07		TP07		TP08		TP08		TP08		TP08		TP09
Date Sampled	8/13/2003		8/13/2003		8/12/2003		8/12/2003		8/12/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/14/2003
Interval	3.0-4.0		9.0-10.0		0.0-1.0		3.0-4.0		9.0-10.0		0.0-1.0		3.0-4.0		3.0-4.0		7.0-8.0		0.0-1.0
QC Identifier	None		None		None		None		None		None		Field Dup. DA-S-TP08-0304-01		Field Dup. DA-S-TP08-0304-01		None		None
Chlorobenzene	0.24	U	0.32	U	0.28	U	0.25	U	0.33	U	0.25	U	0.24	U	0.33	U	0.22	U	0.31
Chloroethane	0.23	U	0.31	U	0.27	U	0.24	U	0.33	U	0.25	U	0.24	U	0.32	U	0.22	U	0.31
Chloroform	0.27	U	0.36	U	0.32	U	0.28	U	0.38	U	0.29	U	0.28	U	0.38	U	0.26	U	0.36
Chloromethane	0.42	U	0.55	U	0.48	U	0.43	U	0.58	U	0.44	U	0.43	U	0.57	U	0.39	U	0.55
cis-1,2-Dichloroethene	0.3	U	0.4	U	0.35	U	0.32	U	0.43	U	0.32	U	0.31	U	0.42	U	0.29	U	0.4
cis-1,3-Dichloropropene	0.18	U	0.23	U	0.2	U	0.18	U	0.25	U	0.18	U	0.18	U	0.24	U	0.17	U	0.23
Dibromochloromethane	0.2	U	0.26	U	0.23	U	0.21	U	0.28	U	0.21	U	0.2	U	0.27	U	0.19	U	0.26
Dibromomethane	0.36	U	0.48	U	0.42	U	0.38	U	0.5	U	0.38	U	0.37	U	0.5	U	0.34	U	0.48
Dichlorodifluoromethane	0.36	U	0.48	U	0.42	U	0.38	U	0.51	U	0.38	U	0.37	U	0.5	U	0.34	U	0.48
Ethylbenzene	0.28	U	0.37	U	0.32	U	0.29	U	0.39	U	0.29	U	0.28	U	0.38	U	0.26	U	0.37
Hexachlorobutadiene	0.25	U	0.33	U	0.29	U	0.26	U	0.34	U	0.26	U	0.25	U	0.34	U	0.23	U	0.33
Isopropylbenzene	0.3	U	0.41	U	0.36	U	0.32	U	0.43	U	0.32	U	0.31	U	0.42	U	0.29	U	0.4
m&p-Xylene	0.59	U	0.79	U	0.69	U	0.62	U	0.83	U	0.62	U	0.61	U	0.81	U	0.56	U	0.78
Methyl tert-Butyl Ether	0.3	U	0.41	U	0.36	U	0.32	U	0.43	U	0.32	U	0.31	U	0.42	U	0.29	U	0.4
Methylene Chloride	5.6	U	7.4	U	6.5	U	5.8	U	7.8	U	5.9	U	5.7	U	7.6	U	5.3	U	7.4
Naphthalene	4	U	5.3	U	4.6	U	4.2	U	5.6	U	4.2	U	4.1	U	5.5	U	3.8	U	5.3
n-Butylbenzene	0.3	U	0.4	U	0.35	U	0.32	U	0.42	U	0.32	U	0.31	U	0.42	U	0.28	U	0.4
n-Propylbenzene	0.27	U	0.36	U	0.32	U	0.29	U	0.38	U	0.29	U	0.28	U	0.38	U	0.26	U	0.36
o-Xylene	0.48	U	0.63	U	0.56	U	0.5	U	0.67	U	0.5	U	0.49	U	0.66	U	0.45	U	0.63
p-Isopropyltoluene	0.26	U	0.35	U	0.3	U	0.27	U	0.37	U	0.28	U	0.27	U	0.36	U	0.25	U	0.35
sec-Butylbenzene	0.26	U	0.35	U	0.31	U	0.28	U	0.37	U	0.28	U	0.27	U	0.37	U	0.25	U	0.35
Styrene	0.49	U	0.66	U	0.57	U	0.52	U	0.69	U	0.52	U	0.51	U	0.68	U	0.47	U	0.65
tert-Butylbenzene	0.28	U	0.37	U	0.32	U	0.29	U	0.39	U	0.29	U	0.28	U	0.38	U	0.26	U	0.36
Tetrachloroethene	0.64	J	0.35	U	0.31	U	0.28	U	5.4		0.28	U	2.1	J	0.37	UJ	4.2		0.35
Toluene	0.23	U	0.31	U	0.27	U	0.24	U	0.33	U	0.25	U	0.24	U	0.32	U	0.22	U	0.31
trans-1,2-Dichloroethene	0.25	U	0.34	U	0.29	U	0.26	U	0.35	U	0.27	U	0.26	U	0.35	U	0.24	U	0.34
trans-1,3-Dichloropropene	0.15	U	0.2	U	0.18	U	0.16	U	0.21	U	0.16	U	0.16	U	0.21	U	0.14	U	0.2
Trichloroethene	0.29	U	0.39	U	0.34	U	0.31	U	7.8		0.31	U	0.3	U	0.4	U	0.28	U	0.39
Trichlorofluoromethane	0.32	U	0.43	U	0.38	U	0.34	U	0.45	U	0.34	U	0.33	U	0.45	U	0.31	U	0.43
Vinyl Chloride	0.44	U	0.59	U	0.52	U	0.46	U	0.62	U	0.47	U	0.46	U	0.61	U	0.42	U	0.59
Semivolatile Organic Analysis (UG/KG)																			
1,2,4-Trichlorobenzene	75	U	71	U	73	U	73	U	76	U	74	U	74	U	74	U	1500	U	80
1,2-Dichlorobenzene	72	U	69	U	70	U	70	U	74	U	71	U	71	U	71	U	1400	U	78
1,2-Diphenylhydrazine	66	U	64	U	65	U	65	U	68	U	66	U	66	U	66	U	1300	U	72
1,3-Dichlorobenzene	75	U	71	U	73	U	73	U	76	U	74	U	74	U	74	U	1500	U	80

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP06 0304-01		DA-S-TP06 0910-01		DA-S-TP07 0001-01		DA-S-TP07 0304-01		DA-S-TP07 0910-01		DA-S-TP08 0001-01		DA-S-TP08-0304-01		DA-S-TP-DUP05-01		DA-S-TP08 0708-01		DA-S-TP09 0001-01
Sample Location	TP06		TP06		TP07		TP07		TP07		TP08		TP08		TP08		TP08		TP09
Date Sampled	8/13/2003		8/13/2003		8/12/2003		8/12/2003		8/12/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/14/2003
Interval	3.0-4.0		9.0-10.0		0.0-1.0		3.0-4.0		9.0-10.0		0.0-1.0		3.0-4.0		3.0-4.0		7.0-8.0		0.0-1.0
QC Identifier	None		None		None		None		None		None		Field Dup. DA-S-TP08-0304-01		Field Dup. DA-S-TP08-0304-01		None		None
1,4-Dichlorobenzene	80	U	76	U	78	U	78	U	82	U	79	U	79	U	79	U	1600	U	86
2,2'-oxybis(1-Chloropropane)	63	U	60	U	62	U	62	U	65	U	62	U	62	U	62	U	1200	U	68
2,4,5-Trichlorophenol	130	U	130	UJ	130	U	130	U	140	U	130	U	130	U	130	U	2600	U	140
2,4,6-Trichlorophenol	220	U	210	UJ	220	U	220	U	230	U	220	U	220	U	220	U	4400	U	240
2,4-Dichlorophenol	150	U	150	UJ	150	U	150	U	160	U	150	U	150	U	150	U	3000	U	170
2,4-Dimethylphenol	540	UJ	520	UJ	530	U	530	U	550	U	540	U	540	U	540	U	11000	U	580
2,4-Dinitrophenol	150	U	140	UJ	140	U	140	U	150	U	140	U	140	U	140	U	2900	U	160
2,4-Dinitrotoluene	71	U	68	U	70	U	70	U	73	U	70	U	70	U	70	U	1400	U	77
2,6-Dichlorophenol	130	U	130	UJ	130	U	130	U	140	U	130	U	130	U	130	U	2600	U	140
2,6-Dinitrotoluene	83	U	79	U	81	U	81	U	85	U	82	U	82	U	82	U	1600	U	89
2-Chloronaphthalene	68	U	64	U	66	U	66	U	69	U	67	U	67	U	67	U	1300	U	73
2-Chlorophenol	140	U	130	U	130	U	130	U	140	U	140	U	140	U	140	U	2700	U	150
2-Methylnaphthalene	220	U	210	U	220	U	220	U	230	U	220	U	220	U	220	U	8600	J	240
2-Methylphenol	180	U	170	UJ	170	U	170	U	180	U	170	U	170	U	170	U	3400	U	190
2-Nitroaniline	150	U	140	U	150	U	150	U	160	U	150	U	150	U	150	U	3000	U	160
2-Nitrophenol	170	U	160	UJ	170	U	170	U	170	U	170	U	170	U	170	U	3400	U	180
3,3'-Dichlorobenzidine	110	U	100	U	100	U	100	U	110	U	100	U	100	U	100	U	2100	U	110
3+4-Methylphenols	190	U	180	UJ	190	U	190	U	200	U	190	U	190	U	190	U	3800	U	200
3-Methylphenol	710	U	680	U	700	U	700	U	730	U	700	U	700	U	700	U	14000	U	770
3-Nitroaniline	110	U	100	U	100	U	100	U	110	U	110	U	110	U	110	U	2100	U	120
4,6-Dinitro-2-methylphenol	120	U	120	UJ	120	U	120	U	120	U	120	U	120	U	120	U	2400	U	130
4-Bromophenyl-phenylether	51	U	49	U	50	U	50	U	52	U	50	U	50	U	50	U	1000	U	55
4-Chloro-3-methylphenol	200	U	190	UJ	190	U	190	U	200	U	200	U	200	U	200	U	3900	U	210
4-Chloroaniline	220	UJ	210	U	220	U	220	U	230	U	220	UJ	220	UJ	220	UJ	4400	U	240
4-Chlorophenyl-phenylether	73	U	70	U	72	U	72	U	75	U	72	U	72	U	72	U	1400	U	79
4-Nitroaniline	200	U	190	U	190	U	190	U	200	U	200	U	200	U	200	U	3900	U	210
4-Nitrophenol	250	U	240	UJ	240	U	240	U	250	U	240	U	240	U	240	U	4900	U	260
Acenaphthene	69	U	66	U	110	J	67	U	71	U	120	J	760	J	370	J	27000		74
Acenaphthylene	90	U	86	U	88	U	88	U	93	U	89	U	89	U	89	U	3500	J	97
Anthracene	94	J	43	U	270	J	110	J	88	J	520	J	2600	J	1100	J	55000		48
Benzidine	4100	UJ	3900	UJ	4000	U	4000	U	4200	U	4000	UJ	4000	UJ	4000	UJ	80000	UJ	4400
Benzo(a)anthracene	290	J	78	U	580		460	J	310	J	1600		5700	J	2500	J	78000		90
Benzo(a)pyrene	190	J	81	U	460	J	490	J	270	J	840		2900		1900		56000		91
Benzo(b)fluoranthene	220	J	100	U	420	J	510	J	280	J	820		3100	J	1800	J	51000		110
Benzo(g,h,i)perylene	130	J	120	U	370	J	400	J	220	J	420	J	1400		1100		33000		130
Benzo(k)fluoranthene	210	J	76	U	430	J	440	J	260	J	880		2900	J	1700	J	47000		86

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

Sample Number	DA-S-TP06-0304-01		DA-S-TP06-0910-01		DA-S-TP07-0001-01		DA-S-TP07-0304-01		DA-S-TP07-0910-01		DA-S-TP08-0001-01		DA-S-TP08-0304-01		DA-S-TP-DUP05-01		DA-S-TP08-0708-01		DA-S-TP09-0001-01
Sample Location	TP06		TP06		TP07		TP07		TP07		TP08		TP08		TP08		TP08		TP09
Date Sampled	8/13/2003		8/13/2003		8/12/2003		8/12/2003		8/12/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/14/2003
Interval	3.0-4.0		9.0-10.0		0.0-1.0		3.0-4.0		9.0-10.0		0.0-1.0		3.0-4.0		3.0-4.0		7.0-8.0		0.0-1.0
QC Identifier	None		None		None		None		None		None		Field Dup. DA-S-TP08-0304-01		Field Dup. DA-S-TP08-0304-01		None		None
Benzoic acid	240	UJ	230	UJ	230	U	230	U	240	U	240	UJ	240	UJ	240	UJ	4700	UJ	5900
Benzyl Alcohol	200	U	190	U	190	U	190	U	200	U	190	U	190	U	190	U	3900	UJ	210
Bis(2-Chloroethoxy)methane	83	U	80	U	81	U	81	U	85	U	82	U	82	U	82	U	1600	U	90
Bis(2-Chloroethyl)ether	76	U	73	U	74	U	74	U	78	U	75	U	75	U	75	U	1500	U	82
bis(2-Ethylhexyl)phthalate	440	J	420	J	110	U	450	J	120	U	120	U	120	U	120	U	2300	U	490
Butylbenzylphthalate	110	U	100	U	110	U	110	U	110	U	110	U	110	U	110	U	2200	U	120
Carbazole	79	U	76	U	160	J	92	J	81	U	470	J	2000	J	670	J	34000		85
Chrysene	290	J	80	U	570	J	570	J	330	J	1500		5600	J	2500	J	71000		120
Dibenzo(a,h)anthracene	150	U	140	U	140	U	140	U	150	U	150	U	520	J	370	J	10000	J	160
Dibenzofuran	120	U	120	U	120	U	120	U	130	U	120	U	450	J	240	J	23000		130
Diethylphthalate	71	U	68	U	70	U	70	U	73	U	150	U	200	U	180	U	1400	U	77
Dimethylphthalate	70	U	67	U	68	U	68	U	72	U	69	U	69	U	69	U	1400	U	75
Di-n-Butylphthalate	80	U	76	U	78	U	78	U	82	U	79	U	79	U	79	U	1600	U	86
Di-n-octylphthalate	140	U	140	U	140	U	140	U	150	U	140	U	140	U	140	U	2800	U	150
Fluoranthene	660	J	65	U	1200		1100	J	650		4100		16000	J	6100	J	200000		230
Fluorene	68	U	65	U	100	J	67	U	70	U	180	J	1000	J	520	J	45000		74
Hexachlorobenzene	56	U	54	U	55	U	55	U	58	U	56	U	56	U	56	U	1100	U	61
Hexachlorobutadiene	100	U	100	U	100	U	100	U	110	U	100	U	100	U	100	U	2100	U	110
Hexachloroethane	83	U	79	U	81	U	81	U	85	U	82	U	82	U	82	U	1600	U	89
Indeno(1,2,3-cd)pyrene	160	U	160	U	320	J	350	J	200	J	420	J	1400		1100		30000		180
Isophorone	83	U	79	U	81	U	81	U	85	U	82	U	82	U	82	U	1600	U	89
Naphthalene	88	U	84	U	86	U	86	U	90	U	86	U	170	J	150	J	20000		94
Nitrobenzene	110	U	100	U	100	U	100	U	110	U	110	U	110	U	110	U	2100	U	120
N-nitrosodimethylamine	72	U	68	U	70	U	70	UJ	73	U	71	U	71	U	71	U	1400	U	77
N-Nitroso-di-n-propylamine	71	U	68	U	69	U	69	U	72	U	70	U	70	U	70	U	1400	U	76
N-Nitroso-diphenylamine	100	U	97	U	99	U	99	U	100	U	100	U	100	U	100	U	2000	U	110
N-nitrosopyrrolidine	100	U	97	U	99	U	99	U	100	U	1500	U	1500	U	1500	U	31000	U	110
Pentachlorophenol	410	J	390	UJ	400	U	400	U	420	U	400	U	400	U	400	U	8100	U	440
Phenanthrene	510	J	65	U	1000		570	J	410	J	2400		12000	J	4500	J	220000		140
Phenol	110	U	110	UJ	110	U	110	U	110	U	110	U	110	U	110	U	2200	U	120
Pyrene	530	J	71	U	1000		980	J	550	J	3300		13000	J	4800	J	150000		200
Pesticide/PCB Analysis (UG/KG)																			
4,4'-DDD	2.02	U	9.66	U	79.1	U	198	U	82.9	U	10	U	20	U	20	U	40	U	10.9
4,4'-DDE	0.952	UJ	4.54	U	216		93	U	39	U	4.7	UJ	9.41	UJ	9.41	UJ	18.8	UJ	5.13
4,4'-DDT	1.9	U	9.09	U	74.4	U	347	J	171	J	9.41	UJ	18.8	UJ	18.8	UJ	37.6	UJ	10.2
Aldrin	0.595	U	2.84	U	23.2	U	58.1	U	24.4	U	2.94	U	5.88	U	5.88	U	11.8	U	3.2

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP06 0304-01		DA-S-TP06 0910-01		DA-S-TP07 0001-01		DA-S-TP07 0304-01		DA-S-TP07 0910-01		DA-S-TP08 0001-01		DA-S-TP08-0304-01		DA-S-TP-DUP05-01		DA-S-TP08 0708-01		DA-S-TP09 0001-01
Sample Location	TP06		TP06		TP07		TP07		TP07		TP08		TP08		TP08		TP08		TP09
Date Sampled	8/13/2003		8/13/2003		8/12/2003		8/12/2003		8/12/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/14/2003
Interval	3.0-4.0		9.0-10.0		0.0-1.0		3.0-4.0		9.0-10.0		0.0-1.0		3.0-4.0		3.0-4.0		7.0-8.0		0.0-1.0
QC Identifier	None		None		None		None		None		None		Field Dup. DA-S-TP08-0304-01		Field Dup. DA-S-TP08-0304-01		None		None
alpha-BHC	0.595	U	2.84	U	23.2	U	58.1	U	24.4	U	2.94	U	5.88	U	5.88	U	11.8	U	3.2
alpha-Chlordane	0.714	U	3.41	U	235		69.8	U	29.3	U	3.53	U	7.06	U	7.06	U	14.1	U	3.85
Aroclor-1016	23.2	U	22.2	U	22.7	U	22.7	U	23.8	U	22.9	U	22.9	U	22.9	UJ	229	U	25
Aroclor-1016/1242	59.5	U	56.8	U	58.1	U	58.1	U	61	U	58.8	U	58.8	U	58.8	U	588	U	64.1
Aroclor-1221	23.2	U	22.2	U	22.7	U	22.7	U	23.8	U	22.9	U	22.9	U	22.9	UJ	229	U	25
Aroclor-1232	23.2	U	22.2	U	22.7	U	22.7	U	23.8	U	22.9	U	22.9	U	22.9	UJ	229	U	25
Aroclor-1242	23.2	U	22.2	U	22.7	U	22.7	U	23.8	U	22.9	U	22.9	U	22.9	UJ	229	U	25
Aroclor-1248	23.2	U	22.2	U	22.7	U	22.7	U	2190	J	22.9	U	117		147	J	229	U	25
Aroclor-1254	23.2	U	22.2	U	5220	J	22.7	UJ	23.8	UJ	22.9	U	22.9	U	22.9	UJ	229	U	25
Aroclor-1260	13.1	U	12.5	U	12.8	U	12.8	U	502		12.9	U	12.9	U	12.9	UJ	129	U	14.1
Aroclor-1268	23.2	U	22.2	U	22.7	U	54.4	J	23.8	U	22.9	U	22.9	U	22.9	UJ	229	U	25
beta-BHC	1.55	U	7.39	U	60.5	U	151	U	63.4	U	7.65	U	15.3	U	15.3	U	30.6	U	8.33
delta-BHC	0.595	U	2.84	U	23.2	U	58.1	U	24.4	U	2.94	U	5.88	U	5.88	U	11.8	U	3.2
Dieldrin	0.833	UJ	3.98	U	32.6	U	81.4	U	34.1	U	4.12	UJ	8.24	UJ	8.24	UJ	16.5	UJ	4.49
Endosulfan I	0.595	U	2.84	U	23.2	U	58.1	U	24.4	U	2.94	UJ	5.88	UJ	5.88	U	11.8	U	3.2
Endosulfan II	2.02	U	9.66	U	79.1	U	198	U	82.9	U	10	U	20	U	20	U	40	U	10.9
Endosulfan Sulfate	1.31	UJ	6.25	UJ	51.2	U	128	U	53.6	U	6.47	U	12.9	U	12.9	U	25.9	U	7.05
Endrin	0.952	U	4.54	U	37.2	U	93	U	39	U	4.7	U	9.41	U	9.41	U	18.8	U	5.13
Endrin Aldehyde	1.55	U	7.39	U	60.5	U	151	U	63.4	U	7.65	U	15.3	U	15.3	U	30.6	U	8.33
Endrin Ketone	1.07	UJ	5.11	UJ	41.9	U	105	U	43.9	U	5.29	U	10.6	U	10.6	U	21.2	U	5.77
gamma-BHC	0.595	U	2.84	U	23.2	U	58.1	U	24.4	U	2.94	U	5.88	U	5.88	U	11.8	U	3.2
gamma-Chlordane	0.595	U	2.84	U	23.2	U	58.1	U	24.4	U	2.94	U	5.88	U	5.88	U	11.8	U	3.2
Heptachlor	0.714	U	3.41	U	27.9	U	69.8	U	29.3	U	3.53	U	7.06	U	7.06	U	14.1	U	3.85
Heptachlor Epoxide	0.595	UJ	2.84	U	23.2	U	58.1	U	24.4	U	2.94	UJ	5.88	UJ	5.88	UJ	11.8	UJ	3.2
Hexachlorobenzene	23.8	U	114	U	930	U	2320	U	976	U	118	U	235	U	235	U	470	U	128
Methoxychlor	5.48	U	26.1	U	214	U	535	U	224	U	27	U	54.1	U	54.1	U	108	U	29.5
Toxaphene	48.1	U	230	U	1880	U	4700	U	1970	U	238	U	475	U	475	U	950	U	259
TAL Metal Analysis (MG/KG)																			
Aluminum	7600		7900		5400		6100		5700		9400		8700		8100		8900		8800
Antimony	0.26	U	0.35	U	0.22	U	0.25	U	6.2		0.25	U	0.29	U	0.30	U	0.39	U	0.40
Arsenic	16.0	J	20.0	J	19.0	J	16.0	J	14.0	J	25.0		24.0		23.0		24.0		11.0
Barium	17.0		12.0		26.0		16.0		19.0		12.0		14.0		13.0		15.0		10.0
Beryllium	0.31	J	0.28	J	0.26		0.28		0.23		0.30		0.31		0.28		0.32		0.26
Cadmium	0.019	U	0.13	U	0.20	J	0.79	J	1.6	J	0.019	UJ	0.018	UJ	0.019	UJ	0.019	UJ	0.090
Calcium	960	J	630	J	1200	J	720	J	2500	J	590		620		590		680		280
Chromium	9.1	J	10.0	J	7.1	J	7.4		10.0		11.0	J	10.0	J	9.5	J	10.0	J	11.0

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP06-0304-01		DA-S-TP06-0910-01		DA-S-TP07-0001-01		DA-S-TP07-0304-01		DA-S-TP07-0910-01		DA-S-TP08-0001-01		DA-S-TP08-0304-01		DA-S-TP-DUP05-01		DA-S-TP08-0708-01		DA-S-TP09-0001-01
Sample Location	TP06		TP06		TP07		TP07		TP07		TP08		TP08		TP08		TP08		TP09
Date Sampled	8/13/2003		8/13/2003		8/12/2003		8/12/2003		8/12/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/14/2003
Interval	3.0-4.0		9.0-10.0		0.0-1.0		3.0-4.0		9.0-10.0		0.0-1.0		3.0-4.0		3.0-4.0		7.0-8.0		0.0-1.0
QC Identifier	None		None		None		None		None		None		Field Dup. DA-S-TP08-0304-01		Field Dup. DA-S-TP08-0304-01		None		None
Cobalt	6.4		15.0		9.0	J	8.1	J	12.0	J	14.0		12.0		12.0		13.0		5.9
Copper	12.0		28.0		17.0		19.0		2600		20.0		20.0		19.0		20.0		16.0
Iron	16000		29000	J	14000		14000		17000		26000		23000		22000		24000		23000
Lead	16.0		14.0		23.0		24.0		400		9.7		12.0		11.0		36.0		25.0
Magnesium	1400	J	2700	J	1400		1200		1400		2900		2400		2300		2400		2100
Manganese	180		920		240		240		260		410		330		330		330		140
Mercury	0.041		0.0070	U	0.14	J	0.045	J	0.13	J	0.00815	U	0.0192		0.0116	J	0.0113	J	0.12
Molybdenum	0.41	U	0.32	U	0.32	U	0.42		1.0		0.29	U	0.26	U	0.25	U	0.32	U	0.39
Nickel	9.8		25.0		12.0		11.0		14.0		21.0		18.0		17.0		18.0		14.0
Potassium	170		240		170		130		88.0		180		160		150		160		130
Selenium	0.14	U	0.11	U	0.11	UJ	0.11	UJ	0.12	UJ	0.12	U	0.12	U	0.12	U	0.12	U	0.13
Silver	0.047	U	0.50		0.56	U	0.094	U	2.5		0.049	U	0.16	U	0.035	U	0.088	U	0.35
Sodium	25.0	U	23.0	U	22.0	U	27.0	U	35.0	U	23.0	U	21.0	U	22.0	U	25.0	U	26.0
Thallium	0.83	U	0.78	U	0.80	U	0.80	U	0.85	U	0.81	U	0.81	U	0.82	U	0.82	U	0.89
Vanadium	14.0		13.0		13.0		13.0		10.0		14.0		14.0		13.0		16.0		19.0
Zinc	34.0	J	68.0	J	40.0		33.0		1200		46.0		42.0		41.0		42.0		35.0
Total Petroleum Hydrocarbon Analysis (UG/KG)																			
Diesel Range Organics	60000	U	57000	U	430000		140000		120000		59000	U	69000		70000		17000		96000
Gasoline Range Organics	1400	J	790	J	750	J	4900	J	9000		7000	U	10000	U	7500	U	6900	U	2300
Miscellaneous Analysis (%)																			
TOTAL SOLIDS	84.0		88.0		86.0		86.0		82.0		85.0		85.0		85.0		85.0		78.0

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number		DA-S-TP09-0102-01		DA-S-TP-DUP04-01		DA-S-TP10-0001-01		DA-S-TP10-0102-01		DA-S-TP11-0001-01		DA-S-TP11-0203-01		DA-S-TP-DUP03-01	
Sample Location		TP09		TP09		TP10		TP10		TP11		TP11		TP11	
Date Sampled		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003	
Interval		1.0-2.0		1.0-2.0		0.0-1.0		1.0-2.0		0.0-1.0		2.0-3.0		2.0-3.0	
QC Identifier		Field Dup. DA-S-TP09-0102-01		Field Dup. DA-S-TP09-0102-01		None		None		None		Field Dup. DA-S-TP11-0203-01		Field Dup. DA-S-TP11-0203-01	
Volatile Organic Analysis (UG/KG)															
1,1,1,2-Tetrachloroethane	U	0.16	U	0.15	U	0.24	U	0.21	U	0.2	U	0.19	U	0.19	U
1,1,1-Trichloroethane	U	0.32	U	0.3	U	0.49	U	0.44	U	0.4	U	0.39	U	0.4	U
1,1,2,2-Tetrachloroethane	UJ	0.21	U	0.2	U	0.32	UJ	0.28	U	0.26	U	0.25	U	0.26	U
1,1,2-Trichloroethane	U	0.23	U	0.21	U	0.35	U	0.31	U	0.29	U	0.28	U	0.28	U
1,1-Dichloroethane	U	0.34	U	0.32	U	0.52	U	0.46	U	0.42	U	0.41	U	0.42	U
1,1-Dichloroethene	U	0.41	U	0.39	U	0.63	U	0.56	U	0.52	U	0.5	U	0.51	U
1,1-Dichloropropene	U	0.27	U	0.26	U	0.42	U	0.38	U	0.35	U	0.34	U	0.34	U
1,2,3-Trichlorobenzene	UJ	0.18	U	0.17	U	0.28	UJ	0.25	U	0.23	U	0.22	U	0.23	U
1,2,3-Trichloropropane	UJ	0.23	U	0.21	U	0.35	UJ	0.31	U	0.29	U	0.28	U	0.28	U
1,2,4-Trichlorobenzene	UJ	0.26	U	0.24	U	0.4	UJ	0.35	U	0.33	U	0.32	U	0.32	U
1,2,4-Trimethylbenzene	UJ	0.25	U	0.24	U	0.39	UJ	0.35	U	0.32	U	0.31	U	0.32	U
1,2-Dibromo-3-chloropropane	UJ	0.38	U	0.36	U	0.58	UJ	0.52	U	0.48	U	0.47	U	0.48	U
1,2-Dibromoethane	U	0.069	U	0.066	U	0.11	U	0.095	U	0.088	U	0.085	U	0.087	U
1,2-Dichlorobenzene	UJ	0.21	U	0.2	U	0.33	UJ	0.29	U	0.27	U	0.26	U	0.27	U
1,2-Dichloroethane	U	0.19	U	0.18	U	0.29	U	0.26	U	0.24	U	0.23	U	0.24	U
1,2-Dichloropropane	U	0.18	U	0.17	U	0.28	U	0.25	U	0.23	U	0.22	U	0.23	U
1,3,5-Trimethylbenzene	UJ	0.22	U	0.2	U	0.33	UJ	0.29	U	0.27	U	0.26	U	0.27	U
1,3-Dichlorobenzene	UJ	0.19	U	0.18	U	0.29	UJ	0.26	U	0.24	U	0.23	U	0.23	U
1,3-Dichloropropane	U	0.28	U	0.26	U	0.43	U	0.38	U	0.35	U	0.34	U	0.35	U
1,4-Dichlorobenzene	UJ	0.16	U	0.15	U	0.24	UJ	0.21	U	0.2	U	0.19	U	0.19	U
2,2-Dichloropropane	U	0.33	U	0.31	U	0.5	U	0.45	U	0.41	U	0.4	U	0.41	U
2-Butanone	J	0.32	U	0.3	U	0.49	U	0.44	U	0.41	U	0.39	U	0.4	U
2-Chlorotoluene	UJ	0.29	U	0.27	U	0.44	UJ	0.39	U	0.36	U	0.35	U	0.36	U
2-Hexanone	U	0.25	U	0.24	U	0.38	U	0.34	U	0.32	U	0.31	U	0.31	U
4-Chlorotoluene	UJ	0.29	U	0.28	U	0.45	UJ	0.4	U	0.37	U	0.36	U	0.36	U
4-Methyl-2-Pentanone	U	0.42	U	0.4	U	0.65	U	0.58	U	0.54	U	0.52	U	0.53	U
Acetone	J	5.3	U	5	U	8.2	U	7.3	U	6.8	U	6.5	U	6.7	U
Benzene	U	0.23	U	0.22	U	0.35	U	0.31	U	0.29	U	0.28	U	0.28	U
Bromobenzene	UJ	0.29	U	0.28	U	0.45	UJ	0.4	U	0.37	U	0.36	U	0.37	U
Bromochloromethane	U	0.2	U	0.18	U	0.3	U	0.27	U	0.25	U	0.24	U	0.24	U
Bromodichloromethane	U	0.28	U	0.27	U	0.44	U	0.39	U	0.36	U	0.35	U	0.35	U
Bromoform	UJ	0.2	U	0.19	U	0.31	UJ	0.28	U	0.26	U	0.25	U	0.25	U
Bromomethane	U	1.2	U	1.1	U	1.8	U	1.6	U	1.5	U	1.4	U	1.5	U
Carbon Disulfide	U	0.34	U	0.33	U	0.53	U	0.47	U	0.44	U	0.42	U	0.43	U
Carbon Tetrachloride	U	0.38	U	0.36	U	0.58	U	0.52	U	0.48	U	0.47	U	0.48	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number		DA-S-TP09-0102-01		DA-S-TP-DUP04-01		DA-S-TP10-0001-01		DA-S-TP10-0102-01		DA-S-TP11-0001-01		DA-S-TP11-0203-01		DA-S-TP-DUP03-01	
Sample Location		TP09		TP09		TP10		TP10		TP11		TP11		TP11	
Date Sampled		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003	
Interval		1.0-2.0		1.0-2.0		0.0-1.0		1.0-2.0		0.0-1.0		2.0-3.0		2.0-3.0	
QC Identifier		Field Dup. DA-S-TP09-0102-01		Field Dup. DA-S-TP09-0102-01		None		None		None		Field Dup. DA-S-TP11-0203-01		Field Dup. DA-S-TP11-0203-01	
Chlorobenzene	U	0.24	U	0.23	U	0.37	U	0.33	U	0.3	U	0.29	U	0.3	U
Chloroethane	U	0.24	U	0.22	U	0.36	U	0.32	U	0.3	U	0.29	U	0.3	U
Chloroform	U	0.28	U	0.26	U	0.42	U	0.38	U	0.35	U	0.34	U	0.34	U
Chloromethane	U	0.42	U	0.4	U	0.64	U	0.58	U	0.53	U	0.52	U	0.53	U
cis-1,2-Dichloroethene	U	0.31	U	0.29	U	0.47	U	0.42	U	0.39	U	0.38	U	0.38	U
cis-1,3-Dichloropropene	U	0.18	U	0.17	U	0.27	U	0.24	U	0.22	U	0.22	U	0.22	U
Dibromochloromethane	U	0.2	U	0.19	U	0.31	U	0.27	U	0.25	U	0.25	U	0.25	U
Dibromomethane	U	0.36	U	0.35	U	0.56	U	0.5	U	0.46	U	0.45	U	0.46	U
Dichlorodifluoromethane	U	0.37	U	0.35	U	0.56	U	0.5	U	0.47	U	0.45	U	0.46	U
Ethylbenzene	U	0.28	U	0.26	U	0.43	U	0.38	U	0.36	U	0.34	U	0.35	U
Hexachlorobutadiene	UJ	0.25	U	0.24	U	0.38	UJ	0.34	U	0.32	U	0.31	U	0.31	U
Isopropylbenzene	UJ	0.31	U	0.29	U	0.48	UJ	0.42	U	0.39	U	0.38	U	0.39	U
m&p-Xylene	U	0.6	U	0.57	U	0.92	U	0.82	U	0.76	U	0.74	U	0.75	U
Methyl tert-Butyl Ether	U	0.31	U	0.29	U	0.48	U	0.42	U	0.39	U	0.38	U	0.39	U
Methylene Chloride	U	5.6	U	5.3	U	8.6	U	7.7	U	7.1	U	6.9	U	7	U
Naphthalene	UJ	4	U	3.8	U	6.2	UJ	5.5	U	5.1	U	5	U	5	U
n-Butylbenzene	UJ	0.3	U	0.29	U	0.47	UJ	0.42	U	0.39	U	0.37	U	0.38	U
n-Propylbenzene	UJ	0.28	U	0.26	U	0.42	UJ	0.38	U	0.35	U	0.34	U	0.35	U
o-Xylene	U	0.48	U	0.46	U	0.74	U	0.66	U	0.61	U	0.59	U	0.6	U
p-Isopropyltoluene	UJ	0.26	U	0.25	U	0.41	UJ	0.36	U	0.34	U	0.33	U	0.33	U
sec-Butylbenzene	UJ	0.27	U	0.26	U	0.41	UJ	0.37	U	0.34	U	0.33	U	0.34	U
Styrene	U	0.5	U	0.47	U	0.76	U	0.68	U	0.63	U	0.61	U	0.62	U
tert-Butylbenzene	UJ	0.28	U	0.26	U	0.43	UJ	0.38	U	0.35	U	0.34	U	0.35	U
Tetrachloroethene	U	0.27	U	0.26	U	0.41	U	0.37	U	0.34	U	0.33	U	0.34	U
Toluene	U	0.24	U	0.22	U	0.36	U	0.32	U	0.3	U	0.29	U	0.3	U
trans-1,2-Dichloroethene	U	0.26	U	0.24	U	0.39	U	0.35	U	0.32	U	0.31	U	0.32	U
trans-1,3-Dichloropropene	U	0.15	U	0.15	U	0.24	U	0.21	U	0.2	U	0.19	U	0.19	U
Trichloroethene	U	0.3	U	0.28	U	0.46	U	0.41	U	0.38	U	0.36	U	0.37	U
Trichlorofluoromethane	U	0.33	U	0.31	U	0.5	U	0.45	U	0.42	U	0.4	U	0.41	U
Vinyl Chloride	U	0.45	U	0.42	U	0.69	U	0.61	U	0.57	U	0.55	U	0.56	U
Semivolatile Organic Analysis (UG/KG)															
1,2,4-Trichlorobenzene	U	75	U	75	U	420	U	78	U	80	U	73	U	73	U
1,2-Dichlorobenzene	U	72	U	72	U	410	U	76	U	78	U	70	U	70	U
1,2-Diphenylhydrazine	U	66	U	66	U	380	U	70	U	72	U	65	U	65	U
1,3-Dichlorobenzene	U	75	U	75	U	420	U	78	U	80	U	73	U	73	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
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APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number		DA-S-TP09-0102-01		DA-S-TP-DUP04-01		DA-S-TP10 0001-01		DA-S-TP10 0102-01		DA-S-TP11 0001-01		DA-S-TP11-0203-01		DA-S-TP-DUP03-01	
Sample Location		TP09		TP09		TP10		TP10		TP11		TP11		TP11	
Date Sampled		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003	
Interval		1.0-2.0		1.0-2.0		0.0-1.0		1.0-2.0		0.0-1.0		2.0-3.0		2.0-3.0	
QC Identifier		Field Dup. DA-S-TP09-0102-01		Field Dup. DA-S-TP09-0102-01		None		None		None		Field Dup. DA-S-TP11-0203-01		Field Dup. DA-S-TP11-0203-01	
1,4-Dichlorobenzene	U	80	U	80	U	460	U	84	U	86	U	78	U	78	U
2,2'-oxybis(1-Chloropropane)	U	63	U	63	U	360	U	66	U	68	U	62	U	62	U
2,4,5-Trichlorophenol	U	130	U	130	U	750	U	140	U	140	U	130	U	130	U
2,4,6-Trichlorophenol	U	220	U	220	U	1200	U	230	U	240	U	220	U	220	U
2,4-Dichlorophenol	U	150	U	150	U	880	U	160	U	170	U	150	U	150	U
2,4-Dimethylphenol	U	540	U	540	U	3100	U	570	U	580	U	530	U	530	U
2,4-Dinitrophenol	U	150	U	150	U	840	U	160	U	160	U	140	U	140	U
2,4-Dinitrotoluene	U	71	U	71	U	400	U	75	U	77	U	70	U	70	U
2,6-Dichlorophenol	U	130	U	130	U	760	U	140	U	140	U	130	U	130	U
2,6-Dinitrotoluene	U	83	U	83	U	470	U	87	U	89	U	81	U	81	U
2-Chloronaphthalene	U	68	U	68	U	380	U	71	U	73	U	66	U	66	U
2-Chlorophenol	U	140	U	140	U	780	U	140	U	150	U	130	U	130	U
2-Methylnaphthalene	U	220	U	220	U	1300	U	240	U	240	U	220	U	220	U
2-Methylphenol	U	180	U	180	U	990	U	180	U	190	U	170	U	170	U
2-Nitroaniline	U	150	U	150	U	860	U	160	U	160	U	150	U	150	U
2-Nitrophenol	U	170	U	170	U	970	U	180	U	180	U	170	U	170	U
3,3'-Dichlorobenzidine	U	110	U	110	U	600	U	110	U	110	U	100	U	100	U
3+4-Methylphenols	U	190	U	190	U	1100	U	200	U	200	U	190	U	190	U
3-Methylphenol	U	710	U	710	U	4000	U	750	U	770	U	700	U	700	U
3-Nitroaniline	U	110	U	110	U	610	U	110	U	120	U	100	U	100	U
4,6-Dinitro-2-methylphenol	U	120	U	120	U	690	U	130	U	130	U	120	U	120	U
4-Bromophenyl-phenylether	U	51	U	51	U	290	U	54	U	55	U	50	U	50	U
4-Chloro-3-methylphenol	U	200	U	200	U	1100	U	210	U	210	U	190	U	190	U
4-Chloroaniline	U	220	U	220	U	1300	U	240	U	240	U	220	U	220	U
4-Chlorophenyl-phenylether	U	73	U	73	U	420	U	77	U	79	U	72	U	72	U
4-Nitroaniline	U	200	U	200	U	1100	U	210	U	210	U	190	U	190	U
4-Nitrophenol	U	250	U	250	U	1400	U	260	U	260	U	240	U	240	U
Acenaphthene	U	69	U	69	U	390	U	72	U	74	U	67	U	67	U
Acenaphthylene	U	90	U	90	U	510	U	95	U	97	U	88	U	88	U
Anthracene	U	45	U	45	U	610	J	47	U	48	U	44	U	44	U
Benzidine	UJ	4100	UJ	4100	UJ	23000	UJ	4300	UJ	4400	UJ	4000	UJ	4000	UJ
Benzo(a)anthracene	J	82	U	82	U	1300	J	120	J	88	U	80	U	80	U
Benzo(a)pyrene	U	85	U	85	U	1100	J	89	J	91	U	83	U	83	U
Benzo(b)fluoranthene	U	100	U	100	U	1300	J	110	U	110	U	100	U	100	U
Benzo(g,h,i)perylene	U	120	U	120	U	890	J	130	U	130	U	120	U	120	U
Benzo(k)fluoranthene	U	79	U	79	U	1100	J	86	J	86	U	78	U	78	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
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APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number		DA-S-TP09-0102-01		DA-S-TP-DUP04-01		DA-S-TP10 0001-01		DA-S-TP10 0102-01		DA-S-TP11 0001-01		DA-S-TP11-0203-01		DA-S-TP-DUP03-01	
Sample Location		TP09		TP09		TP10		TP10		TP11		TP11		TP11	
Date Sampled		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003	
Interval		1.0-2.0		1.0-2.0		0.0-1.0		1.0-2.0		0.0-1.0		2.0-3.0		2.0-3.0	
QC Identifier		Field Dup. DA-S-TP09-0102-01		Field Dup. DA-S-TP09-0102-01		None		None		None		Field Dup. DA-S-TP11-0203-01		Field Dup. DA-S-TP11-0203-01	
Benzoic acid	J	880	J	950	J	1400	U	1100	J	1600	J	940	J	890	J
Benzyl Alcohol	UJ	200	U	200	UJ	1100	U	210	UJ	210	U	190	U	190	U
Bis(2-Chloroethoxy)methane	U	83	U	83	U	470	U	88	U	90	U	81	U	81	U
Bis(2-Chloroethyl)ether	U	76	U	76	U	430	U	80	U	82	U	74	U	74	U
bis(2-Ethylhexyl)phthalate	J	440	J	450	J	660	U	470	J	480	J	430	J	110	U
Butylbenzylphthalate	U	110	U	110	U	620	U	110	U	120	U	110	U	110	U
Carbazole	U	79	U	79	U	480	J	83	U	85	U	77	U	77	U
Chrysene	J	84	U	84	U	1500	J	130	J	91	U	82	U	82	U
Dibenzo(a,h)anthracene	U	150	U	150	U	840	U	160	U	160	U	140	U	140	U
Dibenzofuran	U	120	U	120	U	710	U	130	U	130	U	120	U	120	U
Diethylphthalate	U	71	U	71	U	400	U	75	U	77	U	70	U	70	U
Dimethylphthalate	U	70	U	70	U	400	U	74	U	75	U	68	U	68	U
Di-n-Butylphthalate	U	80	U	80	U	450	U	84	U	86	U	78	U	78	U
Di-n-octylphthalate	U	140	U	140	U	810	U	150	U	150	U	140	U	140	U
Fluoranthene	J	68	U	68	U	2900	J	280	J	74	U	67	U	67	U
Fluorene	U	68	U	68	U	390	U	72	U	74	U	67	U	67	U
Hexachlorobenzene	U	56	U	56	U	320	U	59	U	61	U	55	U	55	U
Hexachlorobutadiene	U	100	U	100	U	600	U	110	U	110	U	100	U	100	U
Hexachloroethane	U	83	U	83	U	470	U	87	U	89	U	81	U	81	U
Indeno(1,2,3-cd)pyrene	U	160	U	160	U	920	U	170	U	180	U	160	U	160	U
Isophorone	U	83	U	83	U	470	U	87	U	89	U	81	U	81	U
Naphthalene	U	88	U	88	U	500	U	92	U	94	U	86	U	86	U
Nitrobenzene	U	110	U	110	U	610	U	110	U	120	U	100	U	100	U
N-nitrosodimethylamine	U	72	U	72	U	410	U	75	U	77	U	70	U	70	U
N-Nitroso-di-n-propylamine	U	71	U	71	U	400	U	74	U	76	U	69	U	69	U
N-Nitroso-diphenylamine	U	100	U	100	U	580	U	110	U	110	U	99	U	99	U
N-nitrosopyrrolidine	U	100	U	100	U	580	U	110	U	110	U	99	U	99	U
Pentachlorophenol	U	410	U	410	U	2300	U	430	U	440	U	400	U	400	U
Phenanthrene	J	68	U	68	U	1900	J	220	J	74	U	67	U	67	U
Phenol	U	110	U	110	U	630	U	120	U	120	U	110	U	110	U
Pyrene	J	75	U	75	U	2500	J	220	J	80	U	73	U	73	U
Pesticide/PCB Analysis (UG/KG)															
4,4'-DDD	U	2.02	U	2.02	U	115	U	10.6	U	10.9	U	1.98	U	1.98	U
4,4'-DDE	U	0.952	U	0.952	U	54	U	5.0	U	5.13	U	0.93	U	0.93	U
4,4'-DDT	U	1.9	U	1.9	U	108	UJ	10	U	10.2	U	1.86	U	1.86	U
Aldrin	U	0.595	U	0.595	U	33.8	U	3.12	U	3.2	U	0.581	U	0.581	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number		DA-S-TP09-0102-01		DA-S-TP-DUP04-01		DA-S-TP10 0001-01		DA-S-TP10 0102-01		DA-S-TP11 0001-01		DA-S-TP11-0203-01		DA-S-TP-DUP03-01	
Sample Location		TP09		TP09		TP10		TP10		TP11		TP11		TP11	
Date Sampled		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003	
Interval		1.0-2.0		1.0-2.0		0.0-1.0		1.0-2.0		0.0-1.0		2.0-3.0		2.0-3.0	
QC Identifier		Field Dup. DA-S-TP09-0102-01		Field Dup. DA-S-TP09-0102-01		None		None		None		Field Dup. DA-S-TP11-0203-01		Field Dup. DA-S-TP11-0203-01	
alpha-BHC	U	0.595	U	0.595	U	33.8	U	3.12	U	3.2	U	0.581	U	0.581	U
alpha-Chlordane	U	0.714	U	0.714	U	40.5	U	3.75	U	3.85	U	0.698	U	0.698	U
Aroclor-1016	U	23.2	U	23.2	U	26.4	U	24.4	U	25	U	22.7	U	22.7	U
Aroclor-1016/1242	U	59.5	U	59.5	U	67.6	U	62.5	U	64.1	U	58.1	U	58.1	U
Aroclor-1221	U	23.2	U	23.2	U	26.4	U	24.4	U	25	U	22.7	U	22.7	U
Aroclor-1232	U	23.2	U	23.2	U	26.4	U	24.4	U	25	U	22.7	U	22.7	U
Aroclor-1242	U	23.2	U	23.2	U	26.4	U	24.4	U	25	U	22.7	U	22.7	U
Aroclor-1248	U	23.2	U	23.2	U	26.4	U	24.4	U	25	U	22.7	U	22.7	U
Aroclor-1254	U	23.2	U	23.2	U	26.4	U	24.4	U	25	U	22.7	U	22.7	U
Aroclor-1260	U	13.1	U	13.1	U	117		13.8	U	14.1	U	12.8	U	12.8	U
Aroclor-1268	U	23.2	U	23.2	U	26.4	U	24.4	U	25	U	22.7	U	22.7	U
beta-BHC	U	1.55	U	1.55	U	87.8	U	8.12	U	8.33	U	1.51	U	1.51	U
delta-BHC	U	0.595	U	0.595	U	33.8	U	3.12	U	3.2	U	0.581	U	0.581	U
Dieldrin	U	0.833	U	0.833	U	47.3	U	4.38	U	4.49	U	0.814	U	0.814	U
Endosulfan I	U	0.595	U	0.595	U	33.8	U	3.12	U	3.2	U	0.581	U	0.581	U
Endosulfan II	U	2.02	U	2.02	U	115	U	10.6	U	10.9	U	1.98	U	1.98	U
Endosulfan Sulfate	UJ	1.31	UJ	1.31	UJ	74.3	UJ	6.88	UJ	7.05	UJ	1.28	UJ	1.28	UJ
Endrin	U	0.952	U	0.952	U	54	U	5.0	U	5.13	U	0.93	U	0.93	U
Endrin Aldehyde	U	1.55	U	1.55	U	87.8	U	8.12	U	8.33	U	1.51	U	1.51	U
Endrin Ketone	UJ	1.07	UJ	1.07	UJ	60.8	UJ	5.62	UJ	5.77	UJ	1.05	UJ	1.05	UJ
gamma-BHC	U	0.595	U	0.595	U	33.8	U	3.12	U	3.2	U	0.581	U	0.581	U
gamma-Chlordane	U	0.595	U	0.595	U	33.8	U	3.12	U	3.2	U	0.581	U	0.581	U
Heptachlor	U	0.714	U	0.714	U	40.5	U	3.75	U	3.85	U	0.698	U	0.698	U
Heptachlor Epoxide	U	0.595	U	0.595	U	33.8	U	3.12	U	3.2	U	0.581	U	0.581	U
Hexachlorobenzene	U	23.8	U	23.8	U	1350	U	125	U	128	U	23.2	U	23.2	U
Methoxychlor	U	5.48	U	5.48	U	311	UJ	28.8	U	29.5	U	5.35	U	5.35	U
Toxaphene	U	48.1	U	48.1	U	2730	UJ	252	U	259	U	47	U	47	U
TAL Metal Analysis (MG/KG)															
Aluminum		13000		12000		9200		11000		11000		13000		15000	
Antimony	U	0.12	U	0.094	U	5.5	J	1.1	U	0.33	U	0.14	U	0.32	U
Arsenic	J	11.0	J	10.0	J	15.0	J	13.0	J	19.0	J	14.0	J	16.0	J
Barium		11.0		9.5		36.0		17.0		16.0		11.0		13.0	
Beryllium	J	0.34	J	0.31	J	0.29	J	0.35	J	0.36	J	0.28	J	0.34	J
Cadmium	U	0.11	U	0.10	U	0.84	J	0.14	U	0.065	U	0.13	U	0.16	U
Calcium	J	240	J	300	J	2500	J	480	J	120	J	940	J	840	J
Chromium	J	15.0	J	14.0	J	64.0	J	13.0	J	12.0	J	14.0	J	14.0	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number		DA-S-TP09-0102-01		DA-S-TP-DUP04-01		DA-S-TP10 0001-01		DA-S-TP10 0102-01		DA-S-TP11 0001-01		DA-S-TP11-0203-01		DA-S-TP-DUP03-01	
Sample Location		TP09		TP09		TP10		TP10		TP11		TP11		TP11	
Date Sampled		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003		8/14/2003	
Interval		1.0-2.0		1.0-2.0		0.0-1.0		1.0-2.0		0.0-1.0		2.0-3.0		2.0-3.0	
QC Identifier		Field Dup. DA-S-TP09-0102-01		Field Dup. DA-S-TP09-0102-01		None		None		None		Field Dup. DA-S-TP11-0203-01		Field Dup. DA-S-TP11-0203-01	
Cobalt		11.0		11.0		10.0		9.0		7.4		12.0		14.0	
Copper		20.0		19.0		560		20.0		18.0		19.0		21.0	
Iron	J	31000	J	29000	J	27000	J	25000	J	30000		36000		41000	
Lead		10.0		9.3		160		15.0		17.0		8.5		9.6	
Magnesium	J	3800	J	3700	J	2900	J	2600	J	2300	J	4200	J	4600	J
Manganese		220		210		360		210		190		300		320	
Mercury		0.024		0.022		0.098		0.041		0.061		0.015	J	0.015	J
Molybdenum	U	0.21	U	0.24	U	0.48	U	0.33	U	0.63	U	0.25	U	0.31	U
Nickel		22.0		22.0		18.0		18.0		17.0		21.0		24.0	
Potassium		140		110		270		150		180		130		150	
Selenium	U	0.12	U	0.12	U	0.13	U	0.12	U	0.12	U	0.12	U	0.58	U
Silver		0.033	U	0.033	U	0.30	U	0.22	U	0.23	U	0.032	U	0.032	U
Sodium	U	21.0	U	19.0	U	37.0	U	32.0	U	30.0	U	24.0	U	26.0	U
Thalllum	U	0.83	U	0.82	U	0.94	U	0.87	U	0.88	U	0.80	U	0.81	U
Vanadium		18.0		16.0		29.0		20.0		24.0		24.0		27.0	
Zinc	J	50.0	J	48.0	J	280	J	50.0	J	44.0	J	54.0	J	62.0	J
Total Petroleum Hydrocarbon Analysis (UG/KG)															
Diesel Range Organics		60000	U	60000	U	180000		62000	U	55000	J	58000	U	58000	U
Gasoline Range Organics	J	940	J	970	J	1200	J	2900	J	1400	J	1900	J	2000	J
Miscellaneous Analysis (%)															
TOTAL SOLIDS		84.0		84.0		74.0		80.0		78.0		86.0		86.0	

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP11-0304-01		DA-S-TP12-0001-01		DA-S-TP12-0102-01		DA-S-TP12-0203-01		DA-S-TP12A-0001-01		DA-S-TP12B-0001-01		DA-S-TP13-0001-01		DA-S-TP13-0203-01		DA-S-TP13-0405-01		DA-S-TP14-0001-01	
Sample Location	TP11		TP12		TP12		TP12		TP12A		TP12B		TP13		TP13		TP13		TP14	
Date Sampled	8/14/2003		8/13/2003		8/13/2003		8/13/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/14/2003	
Interval	3.0-4.0		0.0-1.0		1.0-2.0		2.0-3.0		0.0-1.0		0.0-1.0		0.0-1.0		2.0-3.0		4.0-5.0		0.0-1.0	
QC Identifier	None		None		None		None		None		None		None		None		None		None	
Volatile Organic Analysis (UG/KG)																				
1,1,1,2-Tetrachloroethane	0.18	U	0.17	U	0.16	U	0.14	U	0.17	U	0.22	U	0.18	U	0.17	U	0.14	U	0.14	U
1,1,1-Trichloroethane	0.37	U	0.35	U	0.33	U	0.29	U	0.34	U	0.45	U	0.36	U	0.35	U	0.29	U	0.28	U
1,1,2,2-Tetrachloroethane	0.24	U	0.22	U	0.22	U	0.19	U	0.22	U	0.29	U	0.24	U	0.23	U	0.19	U	0.18	U
1,1,2-Trichloroethane	0.26	U	0.25	U	0.24	U	0.2	U	0.24	U	0.32	U	0.26	U	0.25	U	0.21	U	0.2	U
1,1-Dichloroethane	0.39	U	0.36	U	0.35	U	0.3	U	0.36	U	0.47	U	0.38	U	0.37	U	0.31	U	0.3	U
1,1-Dichloroethene	0.47	U	0.45	U	0.43	U	0.37	U	0.44	U	0.58	U	0.47	U	0.45	U	0.38	U	0.37	U
1,1-Dichloropropene	0.32	U	0.3	U	0.29	U	0.25	U	0.3	U	0.38	U	0.31	U	0.3	U	0.25	U	0.24	U
1,2,3-Trichlorobenzene	0.21	U	0.2	U	0.19	U	0.16	U	0.2	U	0.26	U	0.21	U	0.2	U	0.17	U	0.16	U
1,2,3-Trichloropropane	0.26	U	0.25	U	0.24	U	0.2	U	0.24	U	0.32	U	0.26	U	0.25	U	0.21	U	0.2	U
1,2,4-Trichlorobenzene	0.3	U	0.28	U	0.27	U	0.24	U	0.28	U	0.36	U	0.29	U	0.28	U	0.24	U	0.23	U
1,2,4-Trimethylbenzene	0.29	U	0.28	U	0.26	U	0.23	U	0.27	U	1.4	J	1.2	J	1.1	J	0.23	U	0.23	U
1,2-Dibromo-3-chloropropane	0.44	U	0.41	U	0.4	U	0.34	U	0.41	U	0.53	U	0.43	U	0.42	U	0.35	U	0.34	U
1,2-Dibromoethane	0.08	U	0.075	U	0.072	U	0.063	U	0.075	U	0.097	U	0.079	U	0.076	U	0.064	U	0.062	U
1,2-Dichlorobenzene	0.25	U	0.23	U	0.22	U	0.19	U	0.23	U	0.3	U	0.24	U	0.24	U	0.2	U	0.19	U
1,2-Dichloroethane	0.22	U	0.2	U	0.2	U	0.17	U	0.2	U	0.26	U	0.22	U	0.21	U	0.17	U	0.17	U
1,2-Dichloropropane	0.21	U	0.2	U	0.19	U	0.16	U	0.2	U	0.26	U	0.21	U	0.2	U	0.17	U	0.16	U
1,3,5-Trimethylbenzene	0.25	U	0.23	U	0.22	U	0.2	U	0.23	U	0.3	U	0.24	U	0.24	U	0.2	U	0.19	U
1,3-Dichlorobenzene	0.22	U	0.2	U	0.2	U	0.17	U	0.2	U	0.26	U	0.21	U	0.21	U	0.17	U	0.17	U
1,3-Dichloropropane	0.32	U	0.3	U	0.29	U	0.25	U	0.3	U	0.39	U	0.32	U	0.31	U	0.26	U	0.25	U
1,4-Dichlorobenzene	0.18	U	0.17	U	0.16	U	0.14	U	0.17	U	0.22	U	0.18	U	0.17	U	0.14	U	0.14	U
2,2-Dichloropropane	0.38	U	0.35	U	0.34	U	0.3	U	0.35	U	0.46	U	0.37	U	0.36	U	0.3	U	0.29	U
2-Butanone	0.37	U	0.35	U	0.34	U	0.29	U	0.35	U	0.45	U	0.36	U	0.35	U	0.3	U	0.29	U
2-Chlorotoluene	0.33	U	0.31	U	0.3	U	0.26	U	0.31	U	0.4	U	0.33	U	0.32	U	0.26	U	0.26	U
2-Hexanone	0.29	U	0.27	U	0.26	U	0.23	U	0.27	U	0.35	U	0.28	U	0.28	U	0.23	U	0.22	U
4-Chlorotoluene	0.34	U	0.32	U	0.3	U	0.26	U	0.31	U	0.41	U	0.33	U	0.32	U	0.27	U	0.26	U
4-Methyl-2-Pentanone	0.49	U	0.46	U	0.44	U	0.38	U	0.46	U	0.6	U	0.48	U	0.47	U	0.39	U	0.38	U
Acetone	6.2	U	5.8	U	5.6	U	4.8	U	5.7	U	7.5	U	9.9		5.9	U	4.9	U	4.7	U
Benzene	0.26	U	0.25	U	0.24	U	0.21	U	0.25	U	0.32	U	0.26	U	0.25	U	0.21	U	0.2	U
Bromobenzene	0.34	U	0.32	U	0.31	U	0.27	U	0.32	U	0.41	U	0.33	U	0.32	U	0.27	U	0.26	U
Bromochloromethane	0.22	U	0.21	U	0.2	U	0.18	U	0.21	U	0.27	U	0.22	U	0.22	U	0.18	U	0.17	U
Bromodichloromethane	0.33	U	0.31	U	0.3	U	0.26	U	0.3	U	0.4	U	0.32	U	0.31	U	0.26	U	0.25	U
Bromoform	0.24	U	0.22	U	0.21	U	0.18	U	0.22	U	0.29	U	0.23	U	0.22	U	0.19	U	0.18	U
Bromomethane	1.4	U	1.3	U	1.2	U	1.1	U	1.3	U	1.7	U	1.3	U	1.3	U	1.1	U	1	U
Carbon Disulfide	0.4	U	0.37	U	0.36	U	0.31	U	0.37	U	0.48	U	0.39	U	0.38	U	0.32	U	0.31	U
Carbon Tetrachloride	0.44	U	0.41	U	0.4	U	0.34	U	0.41	U	0.54	U	0.43	U	0.42	U	0.35	U	0.34	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP11-0304-01		DA-S-TP12-0001-01		DA-S-TP12-0102-01		DA-S-TP12-0203-01		DA-S-TP12A-0001-01		DA-S-TP12B-0001-01		DA-S-TP13-0001-01		DA-S-TP13-0203-01		DA-S-TP13-0405-01		DA-S-TP14-0001-01	
Sample Location	TP11		TP12		TP12		TP12		TP12A		TP12B		TP13		TP13		TP13		TP14	
Date Sampled	8/14/2003		8/13/2003		8/13/2003		8/13/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/14/2003	
Interval	3.0-4.0		0.0-1.0		1.0-2.0		2.0-3.0		0.0-1.0		0.0-1.0		0.0-1.0		2.0-3.0		4.0-5.0		0.0-1.0	
QC Identifier	None		None		None		None		None		None		None		None		None		None	
Chlorobenzene	0.28	U	0.26	U	0.25	U	0.22	U	0.26	U	0.34	U	0.27	U	0.26	U	0.22	U	0.21	U
Chloroethane	0.27	U	0.26	U	0.25	U	0.21	U	0.25	U	0.33	U	0.27	U	0.26	U	0.22	U	0.21	U
Chloroform	0.32	U	0.3	U	0.29	U	0.25	U	0.3	U	0.39	U	0.31	U	0.3	U	0.25	U	0.24	U
Chloromethane	0.48	U	0.46	U	0.44	U	0.38	U	0.45	U	0.59	U	0.48	U	0.46	U	0.39	U	0.38	U
cis-1,2-Dichloroethene	0.36	U	0.33	U	0.32	U	0.28	U	0.33	U	0.43	U	0.35	U	0.34	U	0.28	U	0.27	U
cis-1,3-Dichloropropene	0.2	U	0.19	U	0.18	U	0.16	U	0.19	U	0.25	U	0.2	U	0.2	U	0.16	U	0.16	U
Dibromochloromethane	0.23	U	0.22	U	0.21	U	0.18	U	0.22	U	0.28	U	0.23	U	0.22	U	0.18	U	0.18	U
Dibromomethane	0.42	U	0.4	U	0.38	U	0.33	U	0.39	U	0.51	U	0.42	U	0.4	U	0.34	U	0.32	U
Dichlorodifluoromethane	0.42	U	0.4	U	0.38	U	0.33	U	0.4	U	0.52	U	0.42	U	0.4	U	0.34	U	0.33	U
Ethylbenzene	0.32	U	0.3	U	0.29	U	0.25	U	0.3	U	0.39	U	0.32	U	0.31	U	0.26	U	0.25	U
Hexachlorobutadiene	0.29	U	0.27	U	0.26	U	0.23	U	0.27	U	0.35	U	0.28	U	0.27	U	0.23	U	0.22	U
Isopropylbenzene	0.36	U	0.34	U	0.32	U	0.28	U	0.33	U	0.44	U	0.35	U	0.34	U	0.28	U	0.28	U
m&p-Xylene	0.69	U	0.65	U	0.62	U	0.54	U	0.64	U	0.84	U	0.89	J	0.78	J	0.55	U	0.53	U
Methyl tert-Butyl Ether	0.36	U	0.34	U	0.32	U	0.28	U	0.33	U	0.44	U	0.35	U	0.34	U	0.28	U	0.28	U
Methylene Chloride	6.5	U	6.1	U	5.9	U	5.1	U	6.1	U	7.9	U	6.4	U	6.2	U	5.2	U	5	U
Naphthalene	4.7	U	4.4	U	4.2	U	3.7	U	4.4	U	5.7	U	4.6	U	4.4	U	3.7	U	3.6	U
n-Butylbenzene	0.35	U	0.33	U	0.32	U	0.28	U	0.33	U	0.43	U	0.35	U	0.34	U	0.28	U	0.27	U
n-Propylbenzene	0.32	U	0.3	U	0.29	U	0.25	U	0.3	U	0.39	U	0.32	U	0.3	U	0.25	U	0.25	U
o-Xylene	0.56	U	0.52	U	0.5	U	0.44	U	0.52	U	0.68	U	0.55	U	0.53	U	0.44	U	0.43	U
p-Isopropyltoluene	0.31	U	0.29	U	0.28	U	0.24	U	0.29	U	0.37	U	0.3	U	0.29	U	0.24	U	0.24	U
sec-Butylbenzene	0.31	U	0.29	U	0.28	U	0.24	U	0.29	U	0.38	U	0.3	U	0.3	U	0.25	U	0.24	U
Styrene	0.58	U	0.54	U	0.52	U	0.45	U	0.54	U	0.7	U	0.57	U	0.55	U	0.46	U	0.44	U
tert-Butylbenzene	0.32	U	0.3	U	0.29	U	0.25	U	0.3	U	0.39	U	0.32	U	0.31	U	0.26	U	0.25	U
Tetrachloroethene	0.31	U	0.29	U	0.28	U	0.24	U	0.29	U	0.38	U	0.3	U	0.3	U	0.25	U	0.24	U
Toluene	0.27	U	0.26	U	0.25	U	0.21	U	0.25	U	0.33	U	0.27	U	0.26	U	0.22	U	0.21	U
trans-1,2-Dichloroethene	0.3	U	0.28	U	0.27	U	0.23	U	0.28	U	0.36	U	0.29	U	0.28	U	0.24	U	0.23	U
trans-1,3-Dichloropropene	0.18	U	0.17	U	0.16	U	0.14	U	0.17	U	0.22	U	0.18	U	0.17	U	0.14	U	0.14	U
Trichloroethene	0.34	U	0.32	U	0.31	U	0.27	U	0.32	U	0.42	U	0.34	U	0.33	U	0.27	U	0.26	U
Trichlorofluoromethane	0.38	U	0.36	U	0.34	U	0.3	U	0.35	U	0.46	U	0.37	U	0.36	U	0.3	U	0.29	U
Vinyl Chloride	0.52	U	0.49	U	0.47	U	0.41	U	0.48	U	0.63	U	0.51	U	0.49	U	0.41	U	0.4	U
Semivolatile Organic Analysis (UG/KG)																				
1,2,4-Trichlorobenzene	70	U	76	U	74	U	70	U	79	U	85	U	72	U	72	U	70	U	73	U
1,2-Dichlorobenzene	67	U	73	U	71	U	68	U	77	U	82	U	70	U	70	U	68	U	70	U
1,2-Diphenylhydrazine	62	U	67	U	66	U	63	U	71	U	76	U	64	U	64	U	63	U	65	U
1,3-Dichlorobenzene	70	U	76	U	74	U	70	U	79	U	85	U	72	U	72	U	70	U	73	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP11-0304-01		DA-S-TP12-0001-01		DA-S-TP12-0102-01		DA-S-TP12-0203-01		DA-S-TP12A-0001-01		DA-S-TP12B-0001-01		DA-S-TP13-0001-01		DA-S-TP13-0203-01		DA-S-TP13-0405-01		DA-S-TP14-0001-01	
Sample Location	TP11		TP12		TP12		TP12		TP12A		TP12B		TP13		TP13		TP13		TP14	
Date Sampled	8/14/2003		8/13/2003		8/13/2003		8/13/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/14/2003	
Interval	3.0-4.0		0.0-1.0		1.0-2.0		2.0-3.0		0.0-1.0		0.0-1.0		0.0-1.0		2.0-3.0		4.0-5.0		0.0-1.0	
QC Identifier	None		None		None		None		None		None		None		None		None		None	
1,4-Dichlorobenzene	75	U	81	U	79	U	76	U	85	U	91	U	77	U	77	U	76	U	78	U
2,2'-oxybis(1-Chloropropane)	59	U	64	U	62	U	60	U	67	U	72	U	61	U	61	U	60	U	62	U
2,4,5-Trichlorophenol	120	U	130	U	130	U	120	UJ	140	U	150	U	130	U	130	U	120	U	130	U
2,4,6-Trichlorophenol	210	U	220	U	220	U	210	UJ	240	U	250	U	210	U	210	U	210	U	220	U
2,4-Dichlorophenol	140	U	160	U	150	U	150	UJ	160	U	180	U	150	U	150	U	150	U	150	U
2,4-Dimethylphenol	500	U	550	U	540	U	510	UJ	580	U	610	U	520	U	520	U	510	U	530	U
2,4-Dinitrophenol	140	U	150	U	140	U	140	UJ	160	U	170	U	140	U	140	U	140	U	140	U
2,4-Dinitrotoluene	66	U	72	U	70	U	67	U	76	U	81	U	69	U	69	U	67	U	70	U
2,6-Dichlorophenol	120	U	130	U	130	U	120	UJ	140	U	150	U	130	U	130	U	120	U	130	U
2,6-Dinitrotoluene	77	U	84	U	82	U	78	U	88	U	94	U	80	U	80	U	78	U	81	U
2-Chloronaphthalene	63	U	68	U	67	U	64	U	72	U	77	U	65	U	65	U	64	U	66	U
2-Chlorophenol	130	U	140	U	140	U	130	U	150	U	160	U	130	U	130	U	130	U	130	U
2-Methylnaphthalene	210	U	230	U	220	U	210	U	240	U	250	U	220	U	220	U	210	U	220	U
2-Methylphenol	160	U	180	U	170	U	160	UJ	190	U	200	U	170	U	170	U	160	U	170	U
2-Nitroaniline	140	U	150	U	150	U	140	U	160	U	170	U	150	U	150	U	140	U	150	U
2-Nitrophenol	160	U	170	U	170	U	160	UJ	180	U	190	U	160	U	160	U	160	U	170	U
3,3'-Dichlorobenzidine	99	U	110	J	100	U	100	U	110	U	120	U	100	U	100	U	100	U	100	U
3+4-Methylphenols	180	U	190	U	190	U	180	U	200	U	220	U	180	U	180	U	180	U	190	U
3-Methylphenol	670	U	720	U	700	U	670	U	760	U	810	U	690	U	690	U	670	U	700	U
3-Nitroaniline	100	U	110	U	110	U	100	U	110	U	120	U	100	U	100	U	100	U	100	U
4,6-Dinitro-2-methylphenol	110	U	120	U	120	U	110	UJ	130	U	140	U	120	U	120	U	110	U	120	U
4-Bromophenyl-phenylether	48	U	52	U	50	U	48	U	54	U	58	U	49	U	49	U	48	U	50	U
4-Chloro-3-methylphenol	180	U	200	U	200	U	190	UJ	210	U	220	U	190	U	190	U	190	U	190	U
4-Chloroaniline	210	U	230	U	220	U	210	U	240	UJ	260	UJ	220	UJ	220	UJ	210	UJ	220	U
4-Chlorophenyl-phenylether	68	U	74	U	72	U	69	U	78	U	83	U	71	U	71	U	69	U	72	U
4-Nitroaniline	180	U	200	U	200	U	190	U	210	U	220	U	190	U	190	U	190	U	190	U
4-Nitrophenol	230	U	250	U	240	U	230	UJ	260	U	280	U	240	U	240	U	230	U	240	U
Acenaphthene	64	U	70	U	68	U	65	U	73	U	78	U	67	U	67	U	65	U	67	U
Acenaphthylene	84	U	92	U	89	U	85	U	290	J	100	U	87	U	87	U	85	U	88	U
Anthracene	42	U	46	U	44	U	42	U	420	J	51	U	44	U	44	U	42	U	44	U
Benzidine	3800	UJ	4100	U	4000	U	3800	U	4300	UJ	4600	UJ	3900	UJ	3900	UJ	3800	UJ	4000	UJ
Benzo(a)anthracene	77	U	83	U	81	U	78	U	810		150	J	79	U	79	U	78	U	80	U
Benzo(a)pyrene	79	U	86	U	84	U	80	U	740		96	U	82	U	82	U	80	U	83	U
Benzo(b)fluoranthene	99	U	110	U	100	U	100	U	1300		190	J	100	U	100	U	100	U	100	U
Benzo(g,h,i)perylene	110	U	120	U	120	U	120	U	510	J	140	U	120	U	120	U	120	U	120	U
Benzo(k)fluoranthene	74	U	80	U	78	U	75	U	1100		160	J	77	U	77	U	75	U	78	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP11 0304-01		DA-S-TP12 0001-01		DA-S-TP12 0102-01		DA-S-TP12 0203-01		DA-S-TP12A-0001-01		DA-S-TP12B-0001-01		DA-S-TP13 0001-01		DA-S-TP13 0203-01		DA-S-TP13 0405-01		DA-S-TP14 0001-01	
Sample Location	TP11		TP12		TP12		TP12		TP12A		TP12B		TP13		TP13		TP13		TP14	
Date Sampled	8/14/2003		8/13/2003		8/13/2003		8/13/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/14/2003	
Interval	3.0-4.0		0.0-1.0		1.0-2.0		2.0-3.0		0.0-1.0		0.0-1.0		0.0-1.0		2.0-3.0		4.0-5.0		0.0-1.0	
QC Identifier	None		None		None		None		None		None		None		None		None		None	
Benzoic acid	220	UJ	1100	J	240	U	220	U	1500	J	3100	J	230	UJ	230	UJ	220	UJ	230	UJ
Benzyl Alcohol	180	U	200	U	190	U	180	U	210	U	220	U	190	U	190	U	180	U	190	UJ
Bis(2-Chloroethoxy)methane	78	U	84	U	82	U	79	U	89	U	94	U	80	U	80	U	79	U	81	U
Bis(2-Chloroethyl)ether	71	U	77	U	75	U	72	U	81	U	86	U	74	U	74	U	72	U	74	U
bis(2-Ethylhexyl)phthalate	410	J	120	U	120	U	110	U	120	U	130	U	110	U	110	U	110	U	430	J
Butylbenzylphthalate	100	U	110	U	110	U	100	U	120	U	120	U	100	U	100	U	100	U	110	U
Carbazole	74	U	80	U	78	U	75	U	410	J	90	U	76	U	76	U	75	U	77	U
Chrysene	79	U	85	U	83	U	80	U	1300		200	J	81	U	81	U	80	U	82	U
Dibenzo(a,h)anthracene	140	U	150	U	150	U	140	U	160	U	170	U	140	U	140	U	140	U	140	U
Dibenzofuran	120	U	130	U	120	U	120	U	130	U	140	U	120	U	120	U	120	U	120	U
Diethylphthalate	67	U	72	U	70	U	67	U	76	U	81	U	140	U	69	U	67	U	70	U
Dimethylphthalate	65	U	71	U	69	U	66	U	74	U	79	U	68	U	68	U	66	U	68	U
Di-n-Butylphthalate	74	U	81	U	79	U	75	U	85	U	90	U	77	U	77	U	75	U	78	U
Di-n-octylphthalate	130	U	140	U	140	U	130	U	150	U	160	U	140	U	140	U	130	U	140	U
Fluoranthene	64	U	69	U	68	U	65	U	1700		320	J	66	U	66	U	65	U	67	U
Fluorene	64	U	69	U	68	U	65	U	73	U	78	U	66	U	66	U	65	U	67	U
Hexachlorobenzene	53	U	57	U	56	U	53	U	60	U	64	U	54	U	54	U	53	U	55	U
Hexachlorobutadiene	98	U	110	U	100	U	99	U	110	U	120	U	100	U	100	U	99	U	100	U
Hexachloroethane	77	U	84	U	82	U	78	U	88	U	94	U	80	U	80	U	78	U	81	U
Indeno(1,2,3-cd)pyrene	150	U	160	U	160	U	150	U	540	J	180	U	160	U	160	U	150	U	160	U
Isophorone	77	U	84	U	82	U	78	U	88	U	94	U	80	U	80	U	78	U	81	U
Naphthalene	82	U	89	U	86	U	83	U	93	U	99	U	84	U	84	U	83	U	86	U
Nitrobenzene	100	U	110	U	110	U	100	U	110	U	120	U	100	U	100	U	100	U	100	U
N-nitrosodimethylamine	67	U	72	U	71	U	68	U	76	U	81	U	69	U	69	U	68	U	70	U
N-Nitroso-di-n-propylamine	66	U	72	U	70	U	67	U	75	U	80	U	68	U	68	U	67	U	69	U
N-Nitroso-diphenylamine	95	U	100	U	100	U	96	U	110	U	120	U	98	U	98	U	96	U	99	U
N-nitrosopyrrolidine	95	U	100	U	100	U	96	U	1600	U	1800	U	1500	U	1500	U	1500	U	99	U
Pentachlorophenol	380	U	420	U	400	U	390	UJ	440	U	470	U	400	U	400	U	390	U	400	U
Phenanthrene	64	U	69	U	68	U	65	U	300	J	140	J	66	U	66	U	65	U	67	U
Phenol	100	U	110	U	110	U	100	UJ	120	U	130	U	110	U	110	U	100	U	110	U
Pyrene	70	U	76	U	74	U	70	U	1800		290	J	72	U	72	U	70	U	73	U
Pesticide/PCB Analysis (UG/KG)																				
4,4'-DDD	1.89	U	2.05	U	2.0	U	1.91	U	43	U	115	U	1.03	UJ	1.03	UJ	1.01	UJ	9.88	U
4,4'-DDE	0.889	U	0.964	U	0.941	U	0.899	U	20.2	UJ	54	UJ	2.18	UJ	2.18	UJ	2.13	UJ	4.65	U
4,4'-DDT	1.78	U	1.93	U	1.88	U	1.8	U	40.5	UJ	108	UJ	1.26	UJ	1.26	UJ	1.24	UJ	9.3	U
Aldrin	0.556	U	0.602	U	0.588	U	0.562	U	12.6	U	33.8	U	0.69	UJ	0.69	UJ	0.674	UJ	2.91	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

Sample Number	DA-S-TP11-0304-01		DA-S-TP12-0001-01		DA-S-TP12-0102-01		DA-S-TP12-0203-01		DA-S-TP12A-0001-01		DA-S-TP12B-0001-01		DA-S-TP13-0001-01		DA-S-TP13-0203-01		DA-S-TP13-0405-01		DA-S-TP14-0001-01	
Sample Location	TP11		TP12		TP12		TP12		TP12A		TP12B		TP13		TP13		TP13		TP14	
Date Sampled	8/14/2003		8/13/2003		8/13/2003		8/13/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/14/2003	
Interval	3.0-4.0		0.0-1.0		1.0-2.0		2.0-3.0		0.0-1.0		0.0-1.0		0.0-1.0		2.0-3.0		4.0-5.0		0.0-1.0	
QC Identifier	None		None		None		None		None		None		None		None		None		None	
alpha-BHC	0.556	U	0.602	U	0.588	U	0.562	U	12.6	U	33.8	U	0.804	UJ	0.804	UJ	0.786	UJ	2.91	U
alpha-Chlordane	0.667	U	0.723	U	0.706	U	0.674	U	15.2	U	40.5	U	0.575	UJ	0.575	UJ	0.562	UJ	3.49	U
Aroclor-1016	21.7	U	23.5	U	22.9	U	21.9	U	24.7	UJ	26.4	U	22.4	U	22.4	U	21.9	U	22.7	U
Aroclor-1016/1242	55.6	U	60.2	U	58.8	U	56.2	U	63.3	U	67.6	U	57.5	U	57.5	U	56.2	U	58.1	U
Aroclor-1221	21.7	U	23.5	U	22.9	U	21.9	U	24.7	UJ	26.4	U	22.4	U	22.4	U	21.9	U	22.7	U
Aroclor-1232	21.7	U	23.5	U	22.9	U	21.9	U	24.7	UJ	26.4	U	22.4	U	22.4	U	21.9	U	22.7	U
Aroclor-1242	21.7	U	23.5	U	22.9	U	21.9	U	24.7	UJ	26.4	U	22.4	U	22.4	U	21.9	U	22.7	U
Aroclor-1248	21.7	U	23.5	U	22.9	U	21.9	U	24.7	UJ	26.4	U	22.4	U	22.4	U	21.9	U	22.7	U
Aroclor-1254	21.7	U	23.5	U	22.9	U	21.9	U	24.7	UJ	26.4	U	22.4	U	22.4	U	21.9	U	22.7	U
Aroclor-1260	12.2	U	13.2	U	12.9	U	12.4	U	115	J	14.9	U	12.6	U	12.6	U	12.4	U	12.8	U
Aroclor-1268	21.7	U	23.5	U	22.9	U	21.9	U	24.7	UJ	26.4	U	22.4	U	22.4	U	21.9	U	22.7	U
beta-BHC	1.44	U	1.57	U	1.53	U	1.46	U	32.9	U	87.8	U	1.26	UJ	1.26	UJ	1.24	UJ	7.56	U
delta-BHC	0.556	U	0.602	U	0.588	U	0.562	U	12.6	U	33.8	U	1.95	UJ	1.95	UJ	1.91	UJ	2.91	U
Dieldrin	0.778	U	0.843	U	0.824	U	0.786	U	17.7	UJ	47.3	UJ	2.18	UJ	2.18	UJ	2.13	UJ	4.07	U
Endosulfan I	0.556	U	0.602	U	0.588	U	0.562	U	12.6	UJ	33.8	UJ	0.575	UJ	0.575	UJ	0.562	UJ	2.91	U
Endosulfan II	1.89	U	2.05	U	2.0	U	1.91	U	43	U	115	U	1.15	UJ	1.15	UJ	1.12	UJ	9.88	U
Endosulfan Sulfate	1.22	UJ	1.32	U	1.29	U	1.24	U	27.8	U	74.3	U	1.03	UJ	1.03	UJ	1.01	UJ	6.4	UJ
Endrin	0.889	U	0.964	U	0.941	U	0.899	U	20.2	U	54	U	1.03	UJ	1.03	UJ	1.01	UJ	4.65	U
Endrin Aldehyde	1.44	U	1.57	UJ	1.53	U	1.46	U	32.9	U	87.8	U	1.61	UJ	1.61	UJ	1.57	UJ	7.56	U
Endrin Ketone	1.0	UJ	1.08	U	1.06	U	1.01	U	22.8	U	60.8	U	1.15	UJ	1.15	UJ	1.12	UJ	5.23	UJ
gamma-BHC	0.556	U	0.602	U	0.588	U	0.562	U	12.6	U	33.8	U	1.15	UJ	1.15	UJ	1.12	UJ	2.91	U
gamma-Chlordane	0.556	U	0.602	U	0.588	U	0.562	U	12.6	U	33.8	U	1.15	UJ	1.15	UJ	1.12	UJ	2.91	U
Heptachlor	0.667	U	0.723	U	0.706	U	0.674	U	15.2	U	40.5	U	1.72	UJ	1.72	UJ	1.68	UJ	3.49	U
Heptachlor Epoxide	0.556	U	0.602	U	0.588	U	0.562	U	12.6	UJ	33.8	UJ	0.69	UJ	0.69	UJ	0.674	UJ	2.91	U
Hexachlorobenzene	22.2	U	24.1	U	23.5	U	22.5	U	506	U	1350	U	23	UJ	23	UJ	22.5	UJ	116	U
Methoxychlor	5.11	U	5.54	U	5.41	U	5.17	U	116	U	311	U	5.29	UJ	5.29	UJ	5.17	UJ	26.7	U
Toxaphene	44.9	U	48.7	U	47.5	U	45.4	U	1020	U	2730	U	43.7	UJ	43.7	UJ	42.7	UJ	235	U
TAL Metal Analysis (MG/KG)																				
Aluminum	17000		9500	J	8200		10000		9000		10000		8700		7400		7400		4600	
Antimony	1.1	U	0.23	U	0.32	U	0.11	U	1.3		0.74	U	0.41	U	0.29	U	0.32	U	0.33	U
Arsenic	14.0	J	14.0	J	19.0	J	7.0	J	15.0		14.0		90.0		40.0		23.0		3.6	J
Barium	7.6	J	16.0		16.0		6.9		19.0		28.0		13.0		11.0		12.0		14.0	
Beryllium	0.24	J	0.32	J	0.39	J	0.26	J	0.30		0.38		0.42		0.39		0.36		0.18	U
Cadmium	0.24	U	0.13	U	0.019	U	0.018	U	0.020	UJ	0.022	UJ	0.018	UJ	0.018	UJ	0.018	UJ	0.33	J
Calcium	1900	J	220	J	83.0	J	700	J	460		370		39.0		70.0		160		450	J
Chromium	16.0	J	12.0	J	11.0	J	13.0	J	13.0		12.0		9.5	J	9.4	J	8.8	J	4.7	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP11 0304-01		DA-S-TP12 0001-01		DA-S-TP12 0102-01		DA-S-TP12 0203-01		DA-S-TP12A-0001-01		DA-S-TP12B-0001-01		DA-S-TP13 0001-01		DA-S-TP13 0203-01		DA-S-TP13 0405-01		DA-S-TP14 0001-01	
Sample Location	TP11		TP12		TP12		TP12		TP12A		TP12B		TP13		TP13		TP13		TP14	
Date Sampled	8/14/2003		8/13/2003		8/13/2003		8/13/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/15/2003		8/14/2003	
Interval	3.0-4.0		0.0-1.0		1.0-2.0		2.0-3.0		0.0-1.0		0.0-1.0		0.0-1.0		2.0-3.0		4.0-5.0		0.0-1.0	
QC Identifier	None		None		None		None		None		None		None		None		None		None	
Cobalt	11.0		11.0		13.0		15.0		8.9		7.3		20.0		16.0		16.0		3.6	
Copper	18.0		20.0		24.0		28.0		24.0		18.0		30.0		29.0		24.0		8.6	
Iron	42000		27000	J	27000		25000		24000		24000		28000		28000		25000		9800	
Lead	14.0		7.8		6.4		14.0		36.0		40.0		11.0		6.9		6.2		24.0	
Magnesium	6400	J	2600	J	2200	J	3900	J	2400		2000		2400		2300		2300		1700	J
Manganese	280		260		300		400		310		240		410		390		400		170	
Mercury	0.0088	J	0.028		0.011	J	0.0084	U	0.0426		0.0742		0.00813	U	0.00803	U	0.00802	U	0.0090	J
Molybdenum	1.0		0.24	U	0.46	U	0.29	U	0.44	U	0.45	U	0.30	U	0.35	U	0.30	U	0.15	U
Nickel	21.0		19.0		21.0		22.0		17.0		16.0		26.0		25.0		23.0		5.2	
Potassium	81.0		200		170		120		170		170		150		190		180		820	
Selenium	0.55	U	0.12	U	0.12	U	0.11	U	0.12	U	0.19	J	0.11	U	0.11	U	0.11	U	0.12	U
Silver	0.031	U	0.034	U	0.033	U	0.031	U	0.17	U	0.74		0.032	U	0.032	U	0.031	U	0.032	U
Sodium	22.0	U	21.0	U	18.0	U	16.0	U	20.0	U	23.0	U	17.0	U	20.0	U	19.0	U	27.0	U
Thallium	0.78	U	0.84	U	0.82	U	0.78	U	0.88	U	0.94	U	0.79	U	0.79	U	0.78	U	0.81	U
Vanadium	22.0		15.0		15.0		10.0		24.0		28.0		14.0		12.0		12.0		11.0	
Zinc	58.0	J	46.0	J	46.0	J	51.0	J	72.0		68.0		59.0		52.0		46.0		26.0	J
Total Petroleum Hydrocarbon Analysis (UG/KG)																				
Diesel Range Organics	56000	U	17000	U	60000	U	56000	U	11000		12000		57000	U	57000	U	56000	U	58000	U
Gasoline Range Organics	1000	J	5600	J	1700	J	1400	J	7000	U	7900	U	8600	U	6500	U	6200	U	1100	J
Miscellaneous Analysis (%)																				
TOTAL SOLIDS	90.0		83.0		85.0		89.0		79.0		74.0		87.0		87.0		89.0		86.0	

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP14-0506-01		DA-S-TP14-0910-01		DA-S-TP15-0001-01		DA-S-TP15-0203-01		DA-S-TP15-0506-01		DA-S-TP15A-0203-01		DA-S-TP15A-0506-01		DA-S-TP15A-0910-01	
Sample Location	TP14		TP14		TP15		TP15		TP15		TP15A		TP15A		TP15A	
Date Sampled	8/14/2003		8/14/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003	
Interval	5.0-6.0		9.0-10.0		0.0-1.0		2.0-3.0		5.0-6.0		2.0-3.0		5.0-6.0		9.0-10.0	
QC Identifier	None		None		None		None		None		None		None		None	
Volatile Organic Analysis (UG/KG)																
1,1,1,2-Tetrachloroethane	0.21	U	0.22	U	0.2	U	0.16	U	0.24	U	1100	U	340	U	0.2	U
1,1,1-Trichloroethane	0.42	U	0.44	U	0.4	U	0.34	U	0.5	U	880	U	270	U	0.4	U
1,1,2,2-Tetrachloroethane	0.27	UJ	0.29	UJ	0.26	U	0.22	U	0.32	U	1000	U	320	U	0.26	U
1,1,2-Trichloroethane	0.3	U	0.32	U	0.28	U	0.24	U	0.36	U	570	U	180	U	0.28	U
1,1-Dichloroethane	0.44	U	0.47	U	0.42	U	0.36	U	0.53	U	670	U	210	U	0.42	U
1,1-Dichloroethene	0.54	U	0.57	U	0.52	U	0.44	U	0.64	U	1300	U	410	U	0.51	U
1,1-Dichloropropene	0.36	U	0.38	U	0.34	U	0.29	U	0.43	U	1200	U	370	U	0.34	U
1,2,3-Trichlorobenzene	0.24	UJ	0.25	UJ	0.23	U	0.19	U	0.29	U	1400	U	420	U	0.23	U
1,2,3-Trichloropropane	0.3	UJ	0.32	UJ	0.28	U	0.24	U	0.36	U	800	U	250	U	0.28	U
1,2,4-Trichlorobenzene	0.34	UJ	0.36	UJ	0.33	U	0.28	U	0.41	U	980	U	300	U	0.32	U
1,2,4-Trimethylbenzene	3	J	0.35	UJ	0.32	U	0.27	U	0.4	U	900	U	280	U	0.32	U
1,2-Dibromo-3-chloropropane	0.5	UJ	0.53	UJ	0.48	U	0.4	U	0.6	U	5600	U	1700	U	0.48	U
1,2-Dibromoethane	0.092	U	0.096	U	0.087	U	0.074	U	0.11	U	800	U	250	U	0.087	U
1,2-Dichlorobenzene	0.28	UJ	0.3	UJ	0.27	U	0.23	U	0.34	U	540	U	170	U	0.27	U
1,2-Dichloroethane	0.25	U	0.26	U	0.24	U	0.2	U	0.3	U	490	U	150	U	0.24	U
1,2-Dichloropropane	0.24	U	0.25	U	0.23	U	0.19	U	0.29	U	850	U	260	U	0.23	U
1,3,5-Trimethylbenzene	0.28	UJ	0.3	UJ	0.27	U	0.23	U	0.34	U	960	U	300	U	0.27	U
1,3-Dichlorobenzene	0.25	UJ	0.26	UJ	0.24	U	0.2	U	0.29	U	700	U	220	U	0.23	U
1,3-Dichloropropane	0.37	U	0.39	U	0.35	U	0.3	U	0.44	U	620	U	190	U	0.35	U
1,4-Dichlorobenzene	0.21	UJ	0.22	UJ	0.2	U	0.16	U	0.24	U	830	U	260	U	0.2	U
2,2-Dichloropropane	0.43	U	0.45	U	0.41	U	0.35	U	0.51	U	2200	U	690	U	0.41	U
2-Butanone	0.43	U	0.45	U	0.4	U	0.34	U	0.5	U	5900	U	1800	U	0.4	U
2-Chlorotoluene	0.38	UJ	0.4	UJ	0.36	U	0.3	U	0.45	U	840	U	260	U	0.36	U
2-Hexanone	0.33	U	0.35	U	0.32	U	0.27	U	0.39	U	6400	U	2000	U	0.31	U
4-Chlorotoluene	0.39	UJ	0.41	UJ	0.37	U	0.31	U	0.46	U	860	U	270	U	0.36	U
4-Methyl-2-Pentanone	0.56	U	0.59	U	0.54	U	0.45	U	0.67	U	1400	U	440	U	0.53	U
Acetone	7.1	U	7.4	U	6.7	U	5.6	U	8.4	U	5300	U	1600	U	6.7	U
Benzene	0.3	U	0.32	U	0.29	U	0.24	U	0.36	U	1000	U	320	U	0.28	U
Bromobenzene	0.39	UJ	0.41	UJ	0.37	U	0.31	U	0.46	U	530	U	160	U	0.37	U
Bromochloromethane	0.26	U	0.27	U	0.25	U	0.21	U	0.31	U	680	U	210	U	0.24	U
Bromodichloromethane	0.38	U	0.4	U	0.36	U	0.3	U	0.44	U	850	U	260	U	0.36	U
Bromoform	0.27	UJ	0.28	UJ	0.26	U	0.22	U	0.32	U	3900	U	1200	U	0.26	U
Bromomethane	1.6	U	1.6	U	1.5	U	1.2	U	1.8	U	1300	U	390	U	1.5	U
Carbon Disulfide	0.46	U	0.48	U	0.43	U	0.36	U	0.54	U	970	U	300	U	0.43	U
Carbon Tetrachloride	0.51	U	0.53	U	0.48	U	0.4	U	0.6	U	1300	U	410	U	0.48	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP14-0506-01		DA-S-TP14-0910-01		DA-S-TP15-0001-01		DA-S-TP15-0203-01		DA-S-TP15-0506-01		DA-S-TP15A-0203-01		DA-S-TP15A-0506-01		DA-S-TP15A-0910-01	
Sample Location	TP14		TP14		TP15		TP15		TP15		TP15A		TP15A		TP15A	
Date Sampled	8/14/2003		8/14/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003	
Interval	5.0-6.0		9.0-10.0		0.0-1.0		2.0-3.0		5.0-6.0		2.0-3.0		5.0-6.0		9.0-10.0	
QC Identifier	None		None		None		None		None		None		None		None	
Chlorobenzene	0.32	U	0.33	U	0.3	U	0.25	U	0.38	U	1100	U	350	U	0.3	U
Chloroethane	0.31	U	0.33	U	0.3	U	0.25	U	0.37	U	1300	U	390	U	0.3	U
Chloroform	0.36	U	0.38	U	0.35	U	0.29	U	0.43	U	490	U	150	U	0.34	U
Chloromethane	0.56	U	0.59	U	0.53	U	0.45	U	0.66	U	420	U	130	U	0.53	U
cis-1,2-Dichloroethene	0.41	U	0.43	U	0.39	U	0.33	U	0.48	U	650	U	200	U	0.38	U
cis-1,3-Dichloropropene	0.24	U	0.25	U	0.22	U	0.19	U	0.28	U	450	U	140	U	0.22	U
Dibromochloromethane	0.27	U	0.28	U	0.25	U	0.21	U	0.31	U	670	U	210	U	0.25	U
Dibromomethane	0.48	U	0.51	U	0.46	U	0.39	U	0.57	U	680	U	210	U	0.46	U
Dichlorodifluoromethane	0.49	U	0.51	U	0.46	U	0.39	U	0.58	U	1100	U	330	U	0.46	U
Ethylbenzene	0.37	U	0.39	U	0.35	U	0.3	U	0.44	U	990	U	300	U	0.35	U
Hexachlorobutadiene	0.33	UJ	0.35	UJ	0.31	U	0.26	U	0.39	U	1500	U	480	U	0.31	U
Isopropylbenzene	0.41	UJ	0.43	UJ	0.39	U	0.33	U	0.48	U	920	U	280	U	0.39	U
m&p-Xylene	0.79	U	0.83	U	0.75	U	0.63	U	0.94	U	1400	U	420	U	0.75	U
Methyl tert-Butyl Ether	0.41	U	0.43	U	0.39	U	0.33	U	0.48	U	410	U	130	U	0.39	U
Methylene Chloride	7.5	U	7.8	U	7.1	U	6	U	8.8	U	1300	U	670	J	7	U
Naphthalene	5.4	UJ	5.6	UJ	5.1	U	4.3	U	9.7	U	110000		59000		6.2	U
n-Butylbenzene	0.4	UJ	0.42	UJ	0.38	U	0.32	U	0.48	U	1400	U	450	U	0.38	U
n-Propylbenzene	0.37	UJ	0.39	UJ	0.35	U	0.29	U	0.43	U	1100	U	350	U	0.35	U
o-Xylene	0.64	U	0.67	U	0.61	U	0.51	U	0.76	U	1100	U	330	U	0.6	U
p-Isopropyltoluene	0.35	UJ	0.37	UJ	0.33	U	0.28	U	0.42	U	1200	U	360	U	0.33	U
sec-Butylbenzene	0.36	UJ	0.38	UJ	0.34	U	0.28	U	0.42	U	1400	U	440	U	0.34	U
Styrene	0.66	U	0.7	U	0.63	U	0.53	U	0.78	U	1600	U	480	U	0.62	U
tert-Butylbenzene	0.37	UJ	0.39	UJ	0.35	U	0.3	U	0.44	U	1000	U	320	U	0.35	U
Tetrachloroethene	0.36	U	0.38	U	0.34	U	1.3		0.42	U	1500	U	470	U	2	
Toluene	0.31	U	0.33	U	0.3	U	0.25	U	0.37	U	1100	U	340	U	0.3	U
trans-1,2-Dichloroethene	0.34	U	0.36	U	0.32	U	0.27	U	0.4	U	1200	U	370	U	0.32	U
trans-1,3-Dichloropropene	0.2	U	0.22	U	0.19	U	0.16	U	0.24	U	850	U	260	U	0.19	U
Trichloroethene	0.39	U	0.41	U	0.37	U	1.7		0.46	U	1200	U	370	U	3.6	
Trichlorofluoromethane	0.44	U	0.46	U	0.41	U	0.35	U	0.51	U	1000	U	320	U	0.41	U
Vinyl Chloride	0.6	U	0.62	U	0.56	U	0.48	U	0.7	U	960	U	300	U	0.56	U
Semivolatile Organic Analysis (UG/KG)																
1,2,4-Trichlorobenzene	150	U	160	U	72	U	74	U	74	U	36000	U	37000	U	380	U
1,2-Dichlorobenzene	140	U	150	U	70	U	71	U	71	U	35000	U	36000	U	360	U
1,2-Diphenylhydrazine	130	U	140	U	64	U	66	U	66	U	32000	U	33000	U	340	U
1,3-Dichlorobenzene	150	U	160	U	72	U	74	U	74	U	36000	U	37000	U	380	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP14-0506-01		DA-S-TP14-0910-01		DA-S-TP15-0001-01		DA-S-TP15-0203-01		DA-S-TP15-0506-01		DA-S-TP15A-0203-01		DA-S-TP15A-0506-01		DA-S-TP15A-0910-01	
Sample Location	TP14		TP14		TP15		TP15		TP15		TP15A		TP15A		TP15A	
Date Sampled	8/14/2003		8/14/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003	
Interval	5.0-6.0		9.0-10.0		0.0-1.0		2.0-3.0		5.0-6.0		2.0-3.0		5.0-6.0		9.0-10.0	
QC Identifier	None		None		None		None		None		None		None		None	
1,4-Dichlorobenzene	160	U	170	U	77	U	79	U	79	U	39000	U	40000	U	410	U
2,2'-oxybis(1-Chloropropane)	130	U	130	U	61	U	62	U	62	U	31000	U	32000	U	320	U
2,4,5-Trichlorophenol	260	U	280	U	130	U	130	U	130	U	64000	U	66000	U	670	U
2,4,6-Trichlorophenol	440	U	460	U	210	U	220	U	220	U	110000	U	110000	U	1100	U
2,4-Dichlorophenol	310	U	320	U	150	U	150	U	150	U	76000	U	77000	U	780	U
2,4-Dimethylphenol	1100	U	1100	U	520	U	540	U	540	U	260000	U	270000	U	2700	U
2,4-Dinitrophenol	300	U	310	J	140	U	140	U	140	U	72000	U	74000	U	750	U
2,4-Dinitrotoluene	140	U	150	U	69	U	70	U	70	U	35000	U	36000	U	360	U
2,6-Dichlorophenol	270	U	280	U	130	U	130	U	130	U	65000	U	67000	U	670	U
2,6-Dinitrotoluene	160	U	170	U	80	U	82	U	82	U	40000	U	41000	U	420	U
2-Chloronaphthalene	140	U	140	U	65	U	67	U	67	U	33000	U	34000	U	340	U
2-Chlorophenol	280	U	290	U	130	U	140	U	140	U	67000	U	69000	U	700	U
2-Methylnaphthalene	450	U	470	U	220	U	220	U	300	J	110000	U	110000	U	1100	U
2-Methylphenol	350	U	370	U	170	U	170	U	170	U	85000	U	88000	U	880	U
2-Nitroaniline	300	U	320	U	150	U	150	U	150	U	74000	U	76000	U	770	U
2-Nitrophenol	340	U	360	U	160	U	170	U	170	U	83000	U	85000	U	860	U
3,3'-Dichlorobenzidine	210	U	220	J	100	U	100	U	100	U	52000	U	53000	U	540	U
3+4-Methylphenols	380	U	400	U	180	U	190	U	190	U	93000	U	95000	U	960	U
3-Methylphenol	1400	U	1500	U	690	U	700	U	700	U	350000	U	360000	U	3600	U
3-Nitroaniline	220	U	220	U	100	U	110	U	110	U	52000	U	54000	U	540	U
4,6-Dinitro-2-methylphenol	400	U	260	J	120	U	120	U	120	U	59000	U	61000	U	610	U
4-Bromophenyl-phenylether	100	U	110	U	49	U	50	U	50	U	25000	U	26000	U	260	U
4-Chloro-3-methylphenol	400	U	420	U	190	U	200	U	200	U	96000	U	99000	U	1000	U
4-Chloroaniline	450	U	470	U	220	U	220	U	220	U	110000	U	110000	U	1100	U
4-Chlorophenyl-phenylether	150	U	150	U	71	U	72	U	72	U	36000	U	37000	U	370	U
4-Nitroaniline	400	U	420	J	190	U	200	U	200	U	97000	U	99000	U	1000	U
4-Nitrophenol	490	U	520	J	240	U	240	U	240	U	120000	U	120000	U	1200	U
Acenaphthene	140	U	140	U	960		570	J	1900		390000		480000		3200	
Acenaphthylene	180	U	190	U	87	U	89	U	120	J	44000	U	45000	U	460	U
Anthracene	90	U	130	J	3200		1300		3600		790000		970000		8700	
Benzidine	8100	UJ	8600	UJ	3900	U	4000	U	4000	U	2000000	U	2000000	U	21000	U
Benzo(a)anthracene	280	J	420	J	8100		3500		8300		1600000		1900000		16000	
Benzo(a)pyrene	170	U	180	U	4800		3000		6700		1300000		1500000		12000	
Benzo(b)fluoranthene	220	J	440	J	4500		2600		6100		1100000		1300000		9700	
Benzo(g,h,i)perylene	240	U	290	J	2400		1800		4100		720000		830000		6200	
Benzo(k)fluoranthene	230	J	400	J	4600		2600		5600		1100000		1200000		10000	

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP14-0506-01		DA-S-TP14-0910-01		DA-S-TP15-0001-01		DA-S-TP15-0203-01		DA-S-TP15-0506-01		DA-S-TP15A-0203-01		DA-S-TP15A-0506-01		DA-S-TP15A-0910-01	
Sample Location	TP14		TP14		TP15		TP15		TP15		TP15A		TP15A		TP15A	
Date Sampled	8/14/2003		8/14/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003	
Interval	5.0-6.0		9.0-10.0		0.0-1.0		2.0-3.0		5.0-6.0		2.0-3.0		5.0-6.0		9.0-10.0	
QC Identifier	None		None		None		None		None		None		None		None	
Benzoic acid	480	UJ	2300	J	230	U	240	U	240	U	120000	U	120000	U	1200	UJ
Benzyl Alcohol	390	UJ	410	UJ	190	U	190	U	190	U	96000	U	98000	U	990	U
Bis(2-Chloroethoxy)methane	170	U	180	U	80	U	82	U	82	U	41000	U	42000	U	420	U
Bis(2-Chloroethyl)ether	150	U	160	U	74	U	75	U	75	U	37000	U	38000	U	380	U
bis(2-Ethylhexyl)phthalate	1000	J	940	J	110	U	120	U	120	U	57000	U	58000	U	590	U
Butylbenzylphthalate	220	U	230	U	100	U	110	U	110	U	53000	U	54000	U	550	U
Carbazole	160	U	170	U	2800		680		2200		420000		490000		6000	
Chrysene	320	J	460	J	7900		3300		7700		1400000		1700000		14000	
Dibenzo(a,h)anthracene	300	U	310	U	1000		660		1600		280000	J	330000		2500	J
Dibenzofuran	250	U	260	U	670		230	J	980		200000	J	250000	J	2500	J
Diethylphthalate	140	U	150	U	69	U	70	U	70	U	35000	U	36000	U	360	U
Dimethylphthalate	140	U	150	U	68	U	69	U	69	U	34000	U	35000	U	350	U
Di-n-Butylphthalate	160	U	170	U	77	U	79	U	79	U	39000	U	40000	U	400	U
Di-n-octylphthalate	280	U	300	U	140	U	140	U	140	U	70000	U	71000	U	720	U
Fluoranthene	690	J	820	J	21000		7900		20000		3800000		4600000		42000	
Fluorene	140	U	140	U	1300		540	J	1800		390000		480000		4400	
Hexachlorobenzene	110	U	120	U	54	U	56	U	56	U	28000	U	28000	U	290	U
Hexachlorobutadiene	210	U	220	U	100	U	100	U	100	U	51000	U	52000	U	530	UJ
Hexachloroethane	160	U	170	U	80	U	82	U	82	U	40000	U	41000	U	420	U
Indeno(1,2,3-cd)pyrene	330	U	340	U	2500		1800		4100		740000		850000		6700	
Isophorone	160	U	170	U	80	U	82	U	82	U	40000	U	41000	U	420	U
Naphthalene	180	U	180	U	220	J	100	J	710		170000	J	220000	J	1300	J
Nitrobenzene	220	U	230	U	100	U	110	U	110	U	53000	U	54000	U	550	U
N-nitrosodimethylamine	140	U	150	U	69	U	71	U	71	U	35000	U	36000	U	360	U
N-Nitroso-di-n-propylamine	140	U	150	U	68	U	70	U	70	U	34000	U	35000	U	360	U
N-Nitroso-diphenylamine	200	U	210	U	98	U	100	U	100	U	50000	U	51000	U	510	U
N-nitrosopyrrolidine	200	U	210	U	98	U	100	U	100	U	50000	U	51000	U	510	U
Pentachlorophenol	820	U	860	U	400	U	400	U	400	U	200000	U	200000	U	2100	U
Phenanthrene	440	J	140	U	15000		5200		15000		3000000		3500000		34000	
Phenol	220	U	230	U	110	U	110	U	110	U	54000	U	56000	U	560	U
Pyrene	590	J	740	J	17000		6400		16000		3000000		3600000		33000	
Pesticide/PCB Analysis (UG/KG)																
4,4'-DDD	101	U	170	U	39.1	U	40	U	80	U	395	U	405	U	410	U
4,4'-DDE	47.6	U	80	U	18.4	U	18.8	U	37.6	U	186	U	190	U	193	U
4,4'-DDT	95.2	UJ	160	UJ	36.8	U	37.6	U	75.3	U	372	UJ	381	UJ	386	UJ
Aldrin	29.8	U	50	U	11.5	U	11.8	U	23.5	U	116	U	119	U	120	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP14-0506-01		DA-S-TP14-0910-01		DA-S-TP15-0001-01		DA-S-TP15-0203-01		DA-S-TP15-0506-01		DA-S-TP15A-0203-01		DA-S-TP15A-0506-01		DA-S-TP15A-0910-01	
Sample Location	TP14		TP14		TP15		TP15		TP15		TP15A		TP15A		TP15A	
Date Sampled	8/14/2003		8/14/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003	
Interval	5.0-6.0		9.0-10.0		0.0-1.0		2.0-3.0		5.0-6.0		2.0-3.0		5.0-6.0		9.0-10.0	
QC Identifier	None		None		None		None		None		None		None		None	
alpha-BHC	29.8	U	50	U	11.5	U	11.8	U	23.5	U	116	U	119	U	120	U
alpha-Chlordane	35.7	U	60	U	13.8	U	14.1	U	28.2	U	140	U	143	U	144	U
Aroclor-1016	23.2	U	24.4	U	22.4	U	22.9	U	22.9	U	22.7	U	23.2	U	23.5	U
Aroclor-1016/1242	59.5	U	62.5	U	57.5	U	58.8	U	58.8	U	58.1	U	59.5	U	60.2	U
Aroclor-1221	23.2	U	24.4	U	22.4	U	22.9	U	22.9	U	22.7	U	23.2	U	23.5	U
Aroclor-1232	23.2	U	24.4	U	22.4	U	22.9	U	22.9	U	22.7	U	23.2	U	23.5	U
Aroclor-1242	23.2	U	24.4	U	22.4	U	22.9	U	22.9	U	22.7	U	23.2	U	23.5	U
Aroclor-1248	23.2	U	24.4	U	22.4	U	22.9	U	22.9	U	22.7	U	23.2	U	23.5	U
Aroclor-1254	55.2	J	24.4	U	22.4	UJ	22.9	UJ	22.9	UJ	22.7	UJ	23.2	UJ	44.5	J
Aroclor-1260	13.1	U	13.8	U	12.6	U	12.9	U	12.9	U	12.8	U	13.1	U	13.2	U
Aroclor-1268	23.2	U	24.4	U	22.4	U	22.9	U	22.9	U	22.7	U	23.2	U	23.5	U
beta-BHC	77.4	U	130	U	29.9	U	30.6	U	61.2	U	302	U	310	U	313	U
delta-BHC	29.8	U	50	U	11.5	U	11.8	U	23.5	U	116	U	119	U	120	U
Dieldrin	41.7	U	70	U	16.1	U	16.5	U	32.9	U	163	U	167	U	169	U
Endosulfan I	29.8	U	50	U	11.5	U	11.8	U	23.5	U	116	U	119	U	120	U
Endosulfan II	101	U	170	U	39.1	U	40	U	80	U	395	U	405	U	410	U
Endosulfan Sulfate	65.5	UJ	110	U	25.3	U	25.9	U	51.8	U	256	U	262	U	265	U
Endrin	47.6	U	80	U	18.4	U	18.8	U	37.6	U	186	U	190	U	193	U
Endrin Aldehyde	77.4	U	130	U	29.9	U	30.6	U	61.2	U	302	U	310	U	313	U
Endrin Ketone	53.6	UJ	90	U	20.7	U	21.2	U	42.4	U	209	U	214	U	217	U
gamma-BHC	29.8	U	50	U	11.5	U	11.8	U	23.5	U	116	U	119	U	120	U
gamma-Chlordane	29.8	U	50	U	11.5	U	11.8	U	23.5	U	116	U	119	U	120	U
Heptachlor	35.7	U	60	U	13.8	U	14.1	U	28.2	U	140	U	143	U	144	U
Heptachlor Epoxide	29.8	U	50	U	11.5	U	11.8	U	23.5	U	116	U	119	U	120	U
Hexachlorobenzene	1190	U	2000	U	460	U	470	U	941	U	4650	U	4760	U	4820	U
Methoxychlor	274	UJ	460	UJ	106	U	108	U	216	U	1070	U	1100	U	1110	U
Toxaphene	2400	UJ	4040	UJ	929	U	950	U	1900	U	9400	U	9620	U	9730	U
TAL Metal Analysis (MG/KG)																
Aluminum	9300		14000		8000		8500		9100		17000		15000		6500	
Antimony	1.6	U	0.45	U	0.27	U	0.27	U	0.28	U	0.15	U	0.23	U	1.3	
Arsenic	24.0	J	12.0	J	21.0	J	18.0	J	17.0	J	3.4	J	2.7	J	16.0	J
Barium	30.0		21.0		17.0		19.0		24.0		120		120		22.0	
Beryllium	0.36	J	0.41	J	0.33		0.31		0.39		2.5		2.4		0.31	
Cadmium	5.4		3.5	J	0.27	J	0.20	J	0.66	J	0.61	J	0.36	J	0.58	J
Calcium	1200	J	750	J	600	J	1000	J	3400	J	53000	J	46000	J	1100	J
Chromium	20.0	J	14.0	J	9.2	J	9.6	J	10.0	J	3.7		2.6		8.6	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F3
ANALYTICAL RESULTS - SOIL
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-S-TP14-0506-01		DA-S-TP14-0910-01		DA-S-TP15-0001-01		DA-S-TP15-0203-01		DA-S-TP15-0506-01		DA-S-TP15A-0203-01		DA-S-TP15A-0506-01		DA-S-TP15A-0910-01	
Sample Location	TP14		TP14		TP15		TP15		TP15		TP15A		TP15A		TP15A	
Date Sampled	8/14/2003		8/14/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003		8/12/2003	
Interval	5.0-6.0		9.0-10.0		0.0-1.0		2.0-3.0		5.0-6.0		2.0-3.0		5.0-6.0		9.0-10.0	
QC Identifier	None		None		None		None		None		None		None		None	
Cobalt	30.0		13.0		10.0	J	9.8	J	9.8	J	4.4	J	3.4	J	8.5	J
Copper	55.0		20.0		18.0		19.0		23.0		13.0		11.0		26.0	
Iron	38000		29000		21000		20000		21000		4800		3800		17000	
Lead	830		46.0		14.0		20.0		25.0		39.0		35.0		42.0	
Magnesium	3200	J	3000	J	2200		2300		4000		24000		21000		1500	
Manganese	340		220		310		280		340		770		770		280	
Mercury	0.090		0.036		0.029	J	0.064	J	0.044	J	0.069	J	0.075	J	0.076	J
Molybdenum	0.56	U	0.38	U	0.19	U	0.18	U	0.23	U	0.20	U	0.14	U	0.36	U
Nickel	25.0		19.0		16.0		16.0		18.0		7.0		6.0		13.0	
Potassium	190		170		180		160		280		3200		3400		140	
Selenium	0.59	U	0.12	U	0.11	UJ	0.12	UJ	0.12	UJ	0.32	J	0.36	J	0.12	UJ
Silver	2.5		0.14	U	0.064	U	0.036	U	0.054	U	0.12	U	0.12	U	0.16	U
Sodium	45.0	U	48.0	U	29.0	U	35.0	U	72.0	U	1400		1500		30.0	U
Thallium	0.82	U	0.87	U	0.79	U	0.82	U	0.81	U	0.81	U	0.82	U	0.84	U
Vanadium	20.0		19.0		14.0		13.0		14.0		21.0		18.0		12.0	
Zinc	120	J	57.0	J	48.0		45.0		87.0		57.0		51.0		73.0	
Total Petroleum Hydrocarbon Analysis (UG/KG)																
Diesel Range Organics	330000		380000		110000		150000		230000		50000000		63000000		200000	
Gasoline Range Organics	3800	J	1400	J	700	J	6100	J	1900	J	51000		42000		4200	J
Miscellaneous Analysis (%)																
TOTAL SOLIDS	84.0		80.0		87.0		85.0		85.0		86.0		84.0		83.0	

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

F4

SURFACE WATER

APPENDIX F4
ANALYTICAL RESULTS - SURFACE WATER
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-A-SW01-01		DA-A-SW02-01		DA-A-SW-DUP01-01		DA-A-SW03-01		DA-A-SW04-01		DA-A-SW05-01		DA-A-SW06-01		DA-A-SW07-01		DA-A-SW08-01		DA-A-SW09-01	
Sample Location	SW01		SW02		SW02		SW03		SW04		SW05		SW06		SW07		SW08		SW09	
Date Sampled	7/31/2003		7/30/2003		7/30/2003		7/30/2003		7/31/2003		7/30/2003		7/29/2003		7/29/2003		7/29/2003		7/29/2003	
QC Identifier	None		Field Dup. DA-A-SW02-01		Field Dup. DA-A-SW02-01		None		None		None		None		None		None		None	
Volatile Organic Analysis (UG/L)																				
1,1,1,2-Tetrachloroethane	0.31	U	0.31	U	0.31	U	0.31	U	0.31	U	0.31	U	0.31	U	0.31	U	0.31	U	0.31	U
1,1,1-Trichloroethane	0.25	U	2.4	J	2.4	J	1.5	J	0.25	U	1.5	J	0.92	J	0.25	U	0.25	U	0.25	U
1,1,2,2-Tetrachloroethane	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U
1,1,2-Trichloroethane	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
1,1-Dichloroethane	0.19	U	1.6	J	1.6	J	1	J	0.19	U	1.2	J	0.7	J	0.19	U	0.19	U	0.19	U
1,1-Dichloroethene	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U
1,1-Dichloropropene	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U
1,2,3-Trichlorobenzene	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U
1,2,3-Trichloropropane	0.22	U	0.22	U	0.22	U	0.22	U	0.22	U	0.22	U	0.22	U	0.22	U	0.22	U	0.22	U
1,2,4-Trichlorobenzene	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U
1,2,4-Trimethylbenzene	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
1,2-Dibromo-3-chloropropane	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U
1,2-Dibromoethane	0.22	U	0.22	U	0.22	U	0.22	U	0.22	U	0.22	U	0.22	U	0.22	U	0.22	U	0.22	U
1,2-Dichlorobenzene	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
1,2-Dichloroethane	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
1,2-Dichloropropane	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U
1,3,5-Trimethylbenzene	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U
1,3-Dichlorobenzene	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,3-Dichloropropane	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U
1,4-Dichlorobenzene	0.23	U	0.23	U	0.23	U	0.23	U	0.23	U	0.23	U	0.23	U	0.23	U	0.23	U	0.23	U
2,2-Dichloropropane	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U	0.63	U
2-Butanone	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U
2-Chlorotoluene	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U
2-Hexanone	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U
4-Chlorotoluene	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U
4-Methyl-2-Pentanone	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
Acetone	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
Benzene	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U
Bromobenzene	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
Bromochloromethane	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
Bromodichloromethane	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U
Bromoform	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
Bromomethane	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
Carbon Disulfide	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U
Carbon Tetrachloride	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U
Chlorobenzene	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U
Chloroethane	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
Chloroform	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U	0.14	U
Chloromethane	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U
cis-1,2-Dichloroethene	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U	0.18	U
cis-1,3-Dichloropropene	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U	0.13	U
Dibromochloromethane	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
Dibromomethane	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
Dichlorodifluoromethane	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
Ethylbenzene	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U	0.28	U
Hexachlorobutadiene	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U
Isopropylbenzene	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U
m&p-Xylene	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U	0.38	U
Methyl tert-Butyl Ether	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U	0.12	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F4
ANALYTICAL RESULTS - SURFACE WATER
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-A-SW01-01		DA-A-SW02-01		DA-A-SW-DUP01-01		DA-A-SW03-01		DA-A-SW04-01		DA-A-SW05-01		DA-A-SW06-01		DA-A-SW07-01		DA-A-SW08-01		DA-A-SW09-01	
Sample Location	SW01		SW02		SW02		SW03		SW04		SW05		SW06		SW07		SW08		SW09	
Date Sampled	7/31/2003		7/30/2003		7/30/2003		7/30/2003		7/31/2003		7/30/2003		7/29/2003		7/29/2003		7/29/2003		7/29/2003	
QC Identifier	None		Field Dup. DA-A-SW02-01		Field Dup. DA-A-SW02-01		None		None		None		None		None		None		None	
Methylene Chloride	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U
Naphthalene	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U
n-Butylbenzene	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U	0.41	U
n-Propylbenzene	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U	0.32	U
o-Xylene	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
p-Isopropyltoluene	0.33	U	0.33	U	0.33	U	0.33	U	0.33	U	0.33	U	0.33	U	0.33	U	0.33	U	0.33	U
sec-Butylbenzene	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
Styrene	0.44	U	0.44	U	0.44	U	0.44	U	0.44	U	0.44	U	0.44	U	0.44	U	0.44	U	0.44	U
tert-Butylbenzene	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U
Tetrachloroethene	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U
Toluene	0.31	U	0.31	U	0.31	U	0.31	U	0.31	U	0.31	U	0.31	U	0.31	U	0.31	U	0.31	U
trans-1,2-Dichloroethene	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U
trans-1,3-Dichloropropene	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U
Trichloroethene	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U	0.34	U
Trichlorofluoromethane	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U	0.29	U
Vinyl Chloride	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U
Semivolatile Organic Analysis (UG/L)																				
1,2,4-Trichlorobenzene	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1	U
1,2-Dichlorobenzene	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.2	U
1,2-Diphenylhydrazine	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.4	U
1,3-Dichlorobenzene	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U	1	U
1,4-Dichlorobenzene	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
2,2'-oxybis(1-Chloropropane)	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.1	U
2,4,5-Trichlorophenol	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.2	U
2,4,6-Trichlorophenol	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.2	U
2,4-Dichlorophenol	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	2.9	U
2,4-Dimethylphenol	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.2	U
2,4-Dinitrophenol	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.1	U
2,4-Dinitrotoluene	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.3	U
2,6-Dichlorophenol	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.1	U
2,6-Dinitrotoluene	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.3	U
2-Chloronaphthalene	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4	U
2-Chlorophenol	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	3.2	U	2.9	U
2-Methylnaphthalene	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	3.8	U
2-Methylphenol	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	2.8	U
2-Nitroaniline	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.1	U
2-Nitrophenol	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	2.7	U
3,3'-Dichlorobenzidine	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	UJ	5.2	UJ	5.2	UJ	5.2	UJ	4.7	UJ
3+4-Methylphenols	2.8	U	2.8	U	2.8	U	2.8	U	2.8	U	2.8	U	2.8	U	2.8	U	2.8	U	2.6	U
3-Methylphenol	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	5.4	U
3-Nitroaniline	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U	3.4	U
4,6-Dinitro-2-methylphenol	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.3	U	2.1	U
4-Bromophenyl-phenylether	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U
4-Chloro-3-methylphenol	3.3	U	3.3	U	3.3	U	3.3	U	3.3	U	3.3	U	3.3	U	3.3	U	3.3	U	3	U
4-Chloroaniline	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	UJ	4.6	UJ	4.6	UJ	4.6	UJ	4.1	UJ
4-Chlorophenyl-phenylether	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4	U
4-Nitroaniline	2.7	U	2.7	U	2.7	U	2.7	U	2.7	U	2.7	U	2.7	U	2.7	U	2.7	U	2.4	U
4-Nitrophenol	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.8	U

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F4
ANALYTICAL RESULTS - SURFACE WATER
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-A-SW01-01		DA-A-SW02-01		DA-A-SW-DUP01-01		DA-A-SW03-01		DA-A-SW04-01		DA-A-SW05-01		DA-A-SW06-01		DA-A-SW07-01		DA-A-SW08-01		DA-A-SW09-01	
Sample Location	SW01		SW02		SW02		SW03		SW04		SW05		SW06		SW07		SW08		SW09	
Date Sampled	7/31/2003		7/30/2003		7/30/2003		7/30/2003		7/31/2003		7/30/2003		7/29/2003		7/29/2003		7/29/2003		7/29/2003	
QC Identifier	None		Field Dup. DA-A-SW02-01		Field Dup. DA-A-SW02-01		None		None		None		None		None		None		None	
Acenaphthene	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4	U
Acenaphthylene	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.5	U
Anthracene	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.3	U
Benzidine	44	U	44	UJ	44	UJ	44	UJ	44	U	44	UJ	44	UJ	44	UJ	44	UJ	40	UJ
Benzo(a)anthracene	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4	U
Benzo(a)pyrene	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.5	U
Benzo(b)fluoranthene	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U	1.4	U
Benzo(g,h,i)perylene	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.4	U
Benzo(k)fluoranthene	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.5	U
Benzoic acid	15	U	15	U	15	U	15	U	15	U	15	U	15	U	15	U	15	U	14	U
Benzyl Alcohol	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	2.7	U
Bis(2-Chloroethoxy)methane	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U
Bis(2-Chloroethyl)ether	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.6	U
bis(2-Ethylhexyl)phthalate	3.8	U	3.8	J	3.8	J	3.9	J	3.8	U	3.6	J	3.8	J	3.8	J	3.9	J	5	J
Butylbenzylphthalate	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2	U
Carbazole	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.6	U
Chrysene	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.5	U
Dibenzo(a,h)anthracene	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.7	U
Dibenzofuran	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	3	U	2.7	U
Diethylphthalate	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.4	U
Dimethylphthalate	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.4	U
Di-n-Butylphthalate	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.7	U
Di-n-octylphthalate	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.6	U
Fluoranthene	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.6	U
Fluorene	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.3	U
Hexachlorobenzene	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.4	U
Hexachlorobutadiene	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
Hexachloroethane	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	0.92	U
Indeno(1,2,3-cd)pyrene	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.6	U
Isophorone	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.6	U
Naphthalene	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.3	U
Nitrobenzene	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.6	U
N-nitrosodimethylamine	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	4.7	U
N-Nitroso-di-n-propylamine	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.8	U	1.7	U
N-Nitroso-diphenylamine	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.9	U	1.7	U
N-nitrosopyrrolidine	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	1.8	U
Pentachlorophenol	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	3.1	U	2.8	U
Phenanthrene	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.4	U
Phenol	1.8	U	1.8	UJ	1.8	UJ	1.8	UJ	1.8	U	1.8	UJ	1.8	UJ	1.8	UJ	1.8	UJ	1.6	UJ
Pyrene	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.5	U
Pesticide/PCB Analysis (UG/L)																				
4,4'-DDD	0.0076	U	0.0072	U	0.0075	U	0.0070	U	0.0070	U	0.0079	U	0.0072	U	0.014	U	0.014	U	0.014	U
4,4'-DDE	0.0033	U	0.014	J	0.0138	J	0.0030	U	0.0030	U	0.0034	U	0.0031	U	0.0060	U	0.0060	U	0.0060	U
4,4'-DDT	0.0022	U	0.0021	U	0.0348	J	0.0020	U	0.0020	U	0.0023	U	0.0021	U	0.0040	U	0.0040	U	0.0040	U
Aldrin	0.0022	U	0.0021	U	0.0021	U	0.0020	U	0.0020	U	0.0023	U	0.0021	U	0.0040	U	0.0040	U	0.0040	U
alpha-BHC	0.0022	UJ	0.0021	UJ	0.0021	UJ	0.0020	UJ	0.0020	UJ	0.0023	UJ	0.0021	UJ	0.0040	UJ	0.0040	UJ	0.0040	UJ
alpha-Chlordane	0.0011	UJ	0.0010	UJ	0.0011	UJ	0.0010	UJ	0.0010	U	0.0011	UJ	0.0010	UJ	0.0020	UJ	0.0020	UJ	0.0020	UJ
Aroclor-1016	0.538	U	0.50	U	0.51	U	0.50	U	0.505	U	0.606	U	0.50	U	1.04	U	1.06	U	1.04	U
Aroclor-1016/1242	0.538	U	0.50	U	0.51	U	0.50	U	0.505	U	0.606	U	0.50	U	1.04	U	1.06	U	1.04	U

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APPENDIX F4
ANALYTICAL RESULTS - SURFACE WATER
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-A-SW01-01		DA-A-SW02-01		DA-A-SW-DUP01-01		DA-A-SW03-01		DA-A-SW04-01		DA-A-SW05-01		DA-A-SW06-01		DA-A-SW07-01		DA-A-SW08-01		DA-A-SW09-01	
Sample Location	SW01		SW02		SW02		SW03		SW04		SW05		SW06		SW07		SW08		SW09	
Date Sampled	7/31/2003		7/30/2003		7/30/2003		7/30/2003		7/31/2003		7/30/2003		7/29/2003		7/29/2003		7/29/2003		7/29/2003	
QC Identifier	None		Field Dup. DA-A-SW02-01		Field Dup. DA-A-SW02-01		None		None		None		None		None		None		None	
Aroclor-1221	0.538	U	0.50	U	0.51	U	0.50	U	0.505	U	0.606	U	0.50	U	1.04	U	1.06	U	1.04	U
Aroclor-1232	0.538	U	0.50	U	0.51	U	0.50	U	0.505	U	0.606	U	0.50	U	1.04	U	1.06	U	1.04	U
Aroclor-1242	0.538	U	0.50	U	0.51	U	0.50	U	0.505	U	0.606	U	0.50	U	1.04	U	1.06	U	1.04	U
Aroclor-1248	0.538	U	0.50	U	0.51	U	0.50	U	0.505	U	0.606	U	0.50	U	1.04	U	1.06	U	1.04	U
Aroclor-1254	0.538	U	0.50	U	0.51	U	0.50	U	0.505	U	0.606	U	0.50	U	1.04	U	1.06	U	1.04	U
Aroclor-1260	0.043	U	0.040	U	0.0408	U	0.040	U	0.0404	U	0.0485	U	0.040	U	0.0833	U	0.0851	U	0.0833	U
Aroclor-1268	0.538	U	0.50	U	0.51	U	0.50	U	0.505	U	0.606	U	0.50	U	1.04	U	1.06	U	1.04	U
beta-BHC	0.0087	UJ	0.0083	UJ	0.0085	UJ	0.0080	UJ	0.0080	UJ	0.0090	UJ	0.0083	UJ	0.016	UJ	0.016	UJ	0.016	UJ
delta-BHC	0.0022	UJ	0.0021	U	0.0021	U	0.0020	U	0.0020	UJ	0.0023	U	0.0021	U	0.0040	U	0.0040	U	0.0040	U
Dieldrin	0.013	J	0.0137	J	0.0299	J	0.0158	J	0.0030	U	0.0034	U	0.0164	J	0.0060	U	0.0060	U	0.0060	U
Endosulfan I	0.0011	U	0.0010	U	0.0011	U	0.0010	U	0.0010	U	0.0011	U	0.0010	U	0.0020	U	0.0020	U	0.0020	U
Endosulfan II	0.0076	U	0.0072	U	0.0075	U	0.0070	U	0.0070	U	0.0079	U	0.0072	U	0.014	U	0.014	U	0.014	U
Endosulfan Sulfate	0.0033	U	0.0031	U	0.0032	U	0.0030	U	0.0030	U	0.0034	U	0.0031	U	0.0060	U	0.0060	U	0.0060	U
Endrin	0.0033	U	0.0031	U	0.0032	U	0.0030	U	0.0030	U	0.0034	U	0.0031	U	0.0060	U	0.0060	U	0.0060	U
Endrin Aldehyde	0.0044	UJ	0.0041	U	0.0043	U	0.0040	U	0.0040	UJ	0.0045	U	0.0041	U	0.0080	UJ	0.0080	U	0.0080	U
Endrin Ketone	0.0033	UJ	0.0031	UJ	0.0032	UJ	0.0030	UJ	0.0030	UJ	0.0034	UJ	0.0031	UJ	0.0060	UJ	0.0060	UJ	0.0060	UJ
gamma-BHC	0.0022	U	0.0021	U	0.0021	U	0.0020	U	0.0020	U	0.0023	U	0.0021	U	0.0040	U	0.0040	U	0.0040	U
gamma-Chlordane	0.0022	UJ	0.0021	UJ	0.0021	UJ	0.0020	UJ	0.0020	UJ	0.0023	UJ	0.0021	UJ	0.0040	UJ	0.0040	UJ	0.0040	UJ
Heptachlor	0.0011	UJ	0.0010	UJ	0.0011	UJ	0.0010	UJ	0.0010	UJ	0.0011	UJ	0.0010	UJ	0.0020	UJ	0.0020	UJ	0.0020	UJ
Heptachlor Epoxide	0.0022	UJ	0.0021	UJ	0.0021	UJ	0.0020	UJ	0.0020	UJ	0.0023	UJ	0.0021	UJ	0.0040	UJ	0.0040	UJ	0.0040	UJ
Hexachlorobenzene	0.217	UJ	0.206	UJ	0.213	UJ	0.20	UJ	0.20	UJ	0.225	UJ	0.206	UJ	0.40	UJ	0.40	UJ	0.40	UJ
Methoxychlor	0.0174	U	0.0165	U	0.017	U	0.016	U	0.016	U	0.018	U	0.0165	U	0.032	U	0.032	U	0.032	U
Toxaphene	0.0467	U	0.0443	U	0.0457	U	0.043	U	0.043	U	0.0483	U	0.0443	U	0.086	U	0.086	U	0.086	U
TAL Metal Analysis (UG/L)																				
Aluminum	36.0	J	27.0	U	27.0	U	350		42.0	J	77.0	U	110	U	110	U	130	U	190	
Antimony	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U
Arsenic	1.6	U	1.67	J	1.6	U	2.17	J	1.77	J	1.6	U	3.09	J	1.6	U	3.8		2.86	J
Barium	4.5		6.0		5.9		7.9		3.7		6.2		11.0		9.9		10.0		12.0	
Beryllium	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Cadmium	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U
Calcium	32000		37000		36000		36000		23000		36000		31000		20000		20000		20000	
Chromium	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.3	J	1.2	J
Cobalt	1.0	U	1.0	U	1.0	U	2.5		1.0	U	1.2	J	2.3		2.0		2.4		2.9	
Copper	2.5	U	2.5	U	2.5	U	2.6	J	2.5	U	2.5	U	3.2	J	2.5	U	2.5	J	2.8	J
Iron	310		120		140		650		150		210		260		850		870		970	
Lead	0.80	U	0.80	U	0.80	U	11.3		0.80	U	2.87	U	4.18	U	1.57	U	1.67	U	2.18	U
Magnesium	9200		8600		8500		8500		8600		8400		7600		5400		5200		5400	
Manganese	180		15.0		19.0		120		54.0		23.0		89.0		420		430		600	
Mercury	0.012	U	0.012	U	0.012	J	0.018	J	0.012	U	0.012	U	0.012	J	0.013	J	0.012	U	0.015	J
Molybdenum	63.0		75.0		72.0		81.0		1.9	U	78.0		33.0		20.0		20.0		23.0	
Nickel	2.67	J	2.1	U	2.41	J	3.44	J	2.65	J	2.1	U	2.65	J	2.91	J	3.76	J	3.87	J
Potassium	4100		4600		4400		4600		2800		4500		4900		4000		3900		4200	
Selenium	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U
Silver	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Sodium	39000	J	49000		48000		48000		14000	J	48000		44000		24000		23000		24000	
Thallium	3.2	U	3.2	U	3.2	U	3.2	U	3.53	J	3.2	U	3.2	U	3.2	U	3.2	U	4.11	U
Vanadium	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U
Zinc	4.6	U	4.6	U	4.6	U	8.5	J	4.6	U	4.6	U	6.4	J	4.8	J	4.6	U	5.6	J
Dissolved Metal Analysis (UG/L)																				

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX F4
ANALYTICAL RESULTS - SURFACE WATER
NUSC DISPOSAL SITE, NEWPORT, RI

Sample Number	DA-A-SW01-01		DA-A-SW02-01		DA-A-SW-DUP01-01		DA-A-SW03-01		DA-A-SW04-01		DA-A-SW05-01		DA-A-SW06-01		DA-A-SW07-01		DA-A-SW08-01		DA-A-SW09-01	
Sample Location	SW01		SW02		SW02		SW03		SW04		SW05		SW06		SW07		SW08		SW09	
Date Sampled	7/31/2003		7/30/2003		7/30/2003		7/30/2003		7/31/2003		7/30/2003		7/29/2003		7/29/2003		7/29/2003		7/29/2003	
QC Identifier	None		Field Dup. DA-A-SW02-01		Field Dup. DA-A-SW02-01		None		None		None		None		None		None		None	
Aluminum	54.0		23.0	U	25.0	U	370		37.0	J	68.0	U	97.0	U	93.0	U	120	U	180	
Antimony	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U
Arsenic	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	2.43	J	2.88	J	3.04	J
Barium	4.7		6.3		5.8		7.8		3.4		5.8		7.8		9.8		9.9		12.0	
Beryllium	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Cadmium	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U	0.70	U
Calcium	32000		36000		36000		35000		22000		34000		28000		20000		19000		20000	
Chromium	1.2	U	1.2	U	1.2	U	1.2	J	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	J
Cobalt	1.0	U	1.0	U	1.0	U	2.6		1.0	U	1.0	J	2.0		1.8	J	1.9	J	2.8	
Copper	4.2	J	2.5	U	2.5	U	2.8	J	2.5	U	2.5	U	2.9	J	2.5	U	2.5	U	2.6	J
Iron	350		130		180		720		150		180		240		820		850		980	
Lead	0.80	U	0.80	U	0.80	U	12.4		0.80	U	2.44	U	3.82	U	2.07	U	1.82	U	2.01	U
Magnesium	9300		8400		8500		8100		8200		7900		6900		5400		5200		5200	
Manganese	190		15.0		19.0		140		53.0		21.0		74.0		410		430		670	
Mercury	0.012	U	0.012	U	0.014	J	0.012	U	0.012	U	0.012	U	0.012	J	0.013	J	0.016	J	0.016	J
Molybdenum	64.0		72.0		71.0		78.0		1.9	U	73.0		31.0		20.0		19.0		22.0	
Nickel	2.55	J	2.29	J	11.8		3.16	J	2.36	J	2.62	J	2.5	J	2.42	J	2.9	J	3.83	J
Potassium	4200		4500		4400		4600		2600		4400		4600		4100		4100		4300	
Selenium	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U
Silver	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Sodium	40000		48000		47000		48000		13000		47000		41000		24000		24000		24000	
Thallium	3.2	U	3.2	U	3.2	U	3.44	U	3.2	U	3.2	U	3.2	U	3.2	U	3.42	U	3.2	U
Vanadium	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U
Zinc	5.5	J	4.6	U	4.6	U	9.2		4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.8	J

U - Not detected; UJ - Detection limit approximate; J - Quantitation approximate;
* - From dilution analysis; R - Rejected; NA - Not Analyzed

APPENDIX G

RECEPTOR PROFILES USED FOR ECOLOGICAL RISK ASSESSMENT

APPENDIX G1

RECEPTOR PROFILES USED FOR ECOLOGICAL RISK ASSESSMENT

NUSC DISPOSAL AREA

NUWC MIDDLETOWN RHODE ISLAND

The following sections present the receptor profiles for the short-tailed shrew, American robin, meadow vole, northern bobwhite quail, raccoon, and great blue heron. The majority of the information for the profiles was obtained from the Wildlife Exposure Factors Handbook (USEPA, 1993). The data for the incidental soil ingestion rates were obtained from the Estimates of Soil Ingestion by Wildlife (Beyer, 1994) or the draft USEPA Ecological Soil Screening Guidance (USEPA, July 2000).

The food and water ingestion rates are listed in g/g (of body weight)-day on a wet weight basis but were converted to dry weight for the ERA. The home ranges are presented in hectares in USEPA (1993) but were converted to acres by multiplying the number of hectares by 2.471. Also note that the estimated percent of soil in the diets are listed in dry weight. The attached table presents the calculation of the exposure parameters and how the calculations were done.

Short-Tailed Shrew (*Blarina brevicauda*)

Shrews inhabit a wide variety of habitats and are common in areas with abundant vegetative cover. They need cool, moist habitats because of their high metabolic and water-loss rates. The short-tailed shrew is primarily carnivorous, eating insects such as earthworms, slugs, and snails.

The adult body weight for the short-tailed shrew in various habitats ranged from 0.015 to 0.01921 kg with an average of 0.0161 kg. The listed food ingestion rates for shrews are 0.49 and 0.62 g/g-day (wet-weight). The water ingestion rate was listed as 0.223 g/g-day. The food and water ingestion rates in kg/day and L/day, respectively, were calculated as shown in the attached table. The food ingestion rates were then multiplied by 0.16, which is the percent solids of worms (Sample et al., 1997) to convert the ingestion rate from a wet-weight value to a dry-weight value. The incidental soil ingestion rate was calculated by multiplying the ingestion rate by the percentage of soil that is incidentally ingested (assumed 3 percent for conservative food chain model and 1.5 percent for the average food chain model) from USEPA (July 2000). 3 percent is the 90th percentile value and 1.5 percent is the 50th percentile value from USEPA (July 2000).

The home range for the shrew (0. 9699 acres) was calculated using data from a tamarek bog in Manitoba (only value available).

American Robin (*Turdus migratorius*)

American robins' habitats include parks, lawns, moist forests, swamps, open woodlands, and orchards. Robins forage on the ground in open areas, along habitat edges, or the edges of streams. They also may forage above ground in shrubs and within the lower branches of trees. In the months preceding and during the breeding season, robins feed primarily on invertebrates and on some fruits. During the rest of the year their diet consists primarily of fruits.

The adult body weight for the American robin in New York woodlands and forests and in Pennsylvania ranged from 0.0773 to 0.0862 kg with an average of 0.0804 kg. The only listed food ingestion rates were for robins in Kansas (1.52 g/g-day) and California (0.89 g/g-day), with an average of 1.205 g/g-day. The water ingestion rate was estimated as 0.14 g/g-day. Studies calculating ingestion rates for the robin included in the USEPA (December 1993) are based on a diet comprised of berries. Based on these studies, the food and water ingestion rates in kg/day and L/day, respectively, were calculated as shown in the attached table. The food ingestion rates were then multiplied by 0.23, which is the percent solids of fruit (Sample et al., 1997) to convert the ingestion rate from a wet-weight value to a dry-weight value. However, because it is assumed that 100 percent of the robin's diet is worms for the food chain models, the ingestion rate for the robin was calculated using field metabolism scaling as presented on the attached table (Nagy et al., 1999). These are the values that were used in the food chain model for this site. The incidental soil ingestion rate was calculated by multiplying the ingestion rate by the percentage of soil that is incidentally ingested (assumed 3 percent for conservative food chain model and 1.5 percent for the average food chain model) from USEPA (2000). The 3 percent and 1.5 percent values are from the shrew since it is assumed that both the shrew and robin are consuming 100 percent worms, and no incidental soil ingestion rate was available for the robin.

The home range for the robin was calculated using data from Tennessee and a New York dense conifer forest. The values ranged from 0.27 to 1.04 acres with an average home range of 0.6095 acres.

Meadow Vole (*Microtus pennsylvanicus*)

Meadow voles inhabit grassy fields, marshes, and bogs; however, they prefer fields with more grass, more cover, and fewer woody plants. They typically consume green succulent vegetation, sedges, seeds, roots, bark, fungi, insects, and animal matter. However, green succulent vegetation makes up the majority of their diet.

The adult body weight for the vole ranges from 0.017 to 0.0524 kg with an average of 0.0358 kg. The only listed food ingestion rates for voles range from 0.30 to 0.35 g/g-day (wet-weight), with an average of 0.325 g/g-day. The water ingestion rates are 0.14 (estimated) and 0.21 g/g-day, with an average of 0.175 g/g-day. The food and water ingestion rates in kg/day and L/day, respectively, were calculated as shown in the attached table. The food ingestion rates were then multiplied by 0.30, which is the percent solids of young grass (Sample et al., 1997) to convert the ingestion rate from a wet-weight value to a dry-weight value. Finally, the incidental soil ingestion rate is calculated by multiplying the ingestion rate by the percentage of soil that is incidentally ingested (2.4 percent) from Beyer (1994).

The home range for the meadow vole ranges from 0.000494 to 0.2051 acres with an average home range of 0.0659 acres.

Northern Bobwhite Quail (*Colinus virginianus*)

Quails inhabit grasslands, idle fields, pastures, and large clumps of grasses. Bobwhite quails forage in areas with open vegetation, some bare ground, and light litter. Seeds from weeds, woody plants, and grasses comprise the majority of an adult's diet, although green vegetation has been found to dominate the diet of this species in winter in the southern areas of the United States.

The adult body weight for the bobwhite quail ranges from 0.154 to 0.1939 kg with an average of 0.1751 kg. The listed food ingestion rates for quails range from 0.067 to 0.093 g/g-day (wet-weight), with an average of 0.078 g/g-day. The water ingestion rate is estimated as 0.10 and 0.11 g/g-day, and measured as 0.10 to 0.13 g/g-day, for an average water ingestion rate of 0.11 g/g-day. The food and water ingestion rates in kg/day and L/day, respectively, were calculated as shown in the attached table. The food ingestion rates were then multiplied by 0.30, which is the percent solids of young grass (Sample et al., 1997) to convert the ingestion rate from a wet-weight value to a dry-weight value. The incidental soil ingestion rate is calculated by multiplying the food ingestion rate by the percentage of soil that is incidentally ingested (8.2 percent). The 8.2 percent is based on the incidental sediment ingestion rate of a Canada goose (Beyer, 1994), which also consumes terrestrial vegetation, because an incidental soil ingestion rate was not available for the quail.

The home range for the quail ranges from 8.9 to 41.3 acres with an average home range of 18.8 acres.

Raccoon (*Procyon lotor*)

Raccoons are found near virtually every aquatic habitat, particularly in hardwood swamps, mangroves, floodplain forests, and freshwater and saltwater marshes. They are also common in suburban residential areas. They use surface waters for both drinking and foraging. They feed primarily on fleshy fruits, nuts, acorns, and corn, but also eat grains, insects, frogs, crayfish, eggs, and virtually any animal and vegetable matter.

The adult body weight for the raccoon ranges from 3.67 to 7.6 kg, with an average of 5.64 kg. The water ingestion rate ranges from 0.082 to 0.083 g/g. The food and water ingestion rates in kg/day and L/day, respectively, were calculated as shown in the attached table. The incidental sediment ingestion rate is calculated by multiplying the ingestion rate by the percentage of sediment that is incidentally ingested (9.4 percent), as cited in Beyer (1994).

The home range for the conservative model is assumed to be equal to the size of the site indicating that the raccoon will spend all of its time at the site. The typical home range sizes for the raccoon are 96 to 6,325 acres for an average home range of 1,558 acres.

Great Blue Heron (*Ardea herodias*)

Great blue herons inhabit a variety of freshwater and marine areas, including lakes, rivers, marshes, and coastal wetlands, particularly where small fish are plentiful in shallow waters. Fish are the preferred prey, but they also eat amphibians, reptiles, crustaceans, insects, birds, and mammals. The majority of the fish they consume are less than 25 cm (10 inches) in length.

The adult body weights range from 2.204 to 2.576 kg with an average of 2.310 kg. The food ingestion rate is listed as 0.18 g/g-day (wet-weight), while the water ingestion rate is listed as 0.045 g/g-day. The food and water ingestion rates in kg/day and L/day, respectively, were calculated as shown in the attached table. The food ingestion rates were then multiplied by 0.25, which is the percent solids of fish (Sample et al., 1997) to convert the ingestion rate from a wet-weight value to a dry-weight value. The incidental soil ingestion rate is calculated by multiplying the ingestion rate by the percentage of sediment that is incidentally ingested (3.3 percent) based on the mallard (Beyer, 1994). The 3.3 percent is based on the incidental sediment ingestion rate of a mallard (Beyer, 1994), which also consumes aquatic organisms, because an incidental sediment ingestion rate was not available for the heron.

The range of feeding range sizes for the heron is 1.5 to 21 acres for an average feeding range of 11 acres.

References:

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APPENDIX G-1

DRY WEIGHT DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR TERRESTRIAL FOOD CHAIN MODELS

	Data from EPA (1993)			Derivation of Factors for Modeling		
Species/Factor	Age/Sex/ Cond./Seas.	Value	Study Average	Calculation of Values		Notes
American Robin						
Body Weight (g)	A B	77.3	77.3	Minimum Value	0.0773 kg	
				Maximum Value	0.0862 kg	
	A M nonbreeding	86.2		Overall Study Average	0.0804 kg	
	A F nonbreeding	83.6	84.9			
	A M breeding	77.4				
	A F breeding	80.6	79			
Food Ingestion Rate (g/g-day)	B B free-living	0.89		*For Eating Mostly Fruit*		
				Conservative value:	0.0281 kg/day	Maximum ingestion rate * Average Body weight * 0.23[1]
	- B free-living	1.52				
				Average value	0.0223 kg/day	Average ingestion rate * Average Body weight * 0.23[1]
						[1] - 0.23 = percent solids in fruit to convert to a dry weight ingestion rate
	Overall Study Average		1.21			
				Based on Metabolic Scaling		
					0.01247 kg/day	Used maximum body weight in below equation
					0.01188 kg/day	Used average body weight in below equation
						Food ingestion rates were calculated from Nagy et al., (1999) for insectivores as follows: $FI = (9.7*BW(g)^{0.705})/18kJ/g/1000$
Water Ingestion Rate (g/g-day)	A B	0.14		Conservative value:	0.012 L/day	Ingestion rate * Maximum Body weight
				Average value	0.011 L/day	Ingestion rate * Average Body weight
Short-Tailed Shrew						
Body Weight (g)	A B	15	15	Minimum Value	0.0150 kg	
				Maximum Value	0.01921 kg	
	M summer	19.21	17.27	Overall Study Average	0.01613 kg	
	F summer	17.4				
	M fall	16.87				
	M fall	15.58				
Food Ingestion Rate (g/g-day)	A B	0.49		Conservative value:	0.0016 kg/day	Maximum ingestion rate * Average Body weight * 0.16[1]
	A B	0.62		Average value	0.00143 kg/day	Average Ingestion rate * Average Body weight * 0.16[1]
	Overall Study Average		0.555			[1] - 0.16 = percent solids in earthworms to convert to a dry weight ingestion rate
Water Ingestion Rate (g/g-day)	A B	0.223		Conservative value:	0.00428 L/day	Ingestion rate * Maximum Body weight
				Average value	0.00360 L/day	Ingestion rate * Average Body weight

APPENDIX G-1

DRY WEIGHT DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR TERRESTRIAL FOOD CHAIN MODELS

Species/Factor	Data from EPA (1993) Age/Sex/ Cond./Seas.	Value	Study Average	Derivation of Factors for Modeling: Calculation of Values		Notes
Meadow Vole						
Body Weight (g)	A M summer	40	36.7	Minimum Value	0.017 kg	
	A F summer	33.4		Maximum Value	0.052 kg	
				Overall Study Average	0.0358 kg	
	A M spring	52.4	48.0			
	A F spring	43.5				
	A B spring	26	21.2			
	A B summer	24.3				
	A B fall	17				
	A B winter	17.5				
	A M	35.5	37.3			
	A F	39				
Food Ingestion Rate (g/g-day)		0.3	0.33	Conservative value:	0.003756 kg/day	Maximum ingestion rate * Average Body weight * 0.3 (1)
		0.35		Average value	0.003488 kg/day	Average ingestion rate * Average Body weight * 0.3(1)
						(1) - 0.30 = percent solids in grass to convert to a dry weight ingestion rate
Water Ingestion Rate	A B	0.21	0.18	Conservative value:	0.007513 L/day	Maximum ingestion rate * Average Body weight
	A B	0.14		Average value	0.006261 L/day	Average ingestion rate * Average Body weight
Northern Bobwhite Quail						
Body Weight (g)	A B fall	189.9	191	Minimum Value	0.154 kg	
	A B winter	193.9		Maximum Value	0.194 kg	
	A B spring	190		Overall Study Average	0.1751 kg	
	A M winter	181	177			
	A M summer	163				
	A F winter	183				
	A F summer	180				
	A M winter	161	157			
	A M summer	154				
	A F winter	157				
	A F summer	157				
Food Ingestion Rate (g/g-day)	A B winter	0.093	0.078	Conservative value:	0.00488 kg/day	Maximum ingestion rate * Average Body weight * 0.3(1)
	A B spring	0.067				
	A B summer	0.079		Average value	0.00408 kg/day	Average ingestion rate * Average Body weight * 0.3(1)
	A B fall	0.072				
						(1) - 0.30 = percent solids in grass to convert to a dry weight ingestion rate
Water Ingestion Rate (g/g-day)	A M summer	0.1	0.11	Conservative value:	0.0227616 L/day	Maximum ingestion rate * Average Body weight
	A F summer	0.13				
	A M summer	0.11		Average value	0.0192598 L/day	Average ingestion rate * Average Body weight
	A F summer	0.1				

APPENDIX G-1

DRY WEIGHT DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR TERRESTRIAL FOOD CHAIN MODELS

	Data from EPA (1993)			Derivation of Factors for Modeling		
Species/Factor	Age/Sex/ Cond./Seas.	Value	Study Average	Calculation of Values		Notes
Raccoon						
Body Weight (kg)	A M	7.6	6.7	Minimum Value	3.67 kg	
	A F parous	6.4		Maximum Value	7.6 kg	
	A F nulliparous	6		Overall Study Average	5.636 kg	
	A M	6.76	6.25			
	A F	5.74				
	A M	4.31	3.99			
	A F	3.67				
Food Ingestion Rate (g/g-day)			No Value	Conservative value:	0.237 kg/day	Used maximum body weight in below equation
				Average value	0.184 kg/day	Used average body weight in below equation
						Food ingestion rates were calculated from Nagy et al., (1999) for carnivores as follows: $FI = ((2.23)*BW(g)^{0.85})/1000$
Water Ingestion Rate (g/g-day)	A M	0.082	0.083	Conservative value:	0.468 L/day	Maximum ingestion rate * Average Body weight
	A F	0.083		Average value	0.465 L/day	Average ingestion rate * Average Body weight
Great Blue Heron						
Body Weight (g)	A B	2229	2229	Minimum Value	2.204 kg	
				Maximum Value	2.576 kg	
	A F	2204	2390	Overall Study Average	2.310 kg	
	A M	2576				
Food Ingestion Rate (g/g-day)	A B	0.18		Conservative value:	0.116 kg/day	Ingestion rate * Maximum Body weight * 0.25[1]
				Average value	0.104 kg/day	Ingestion rate * Average Body weight * 0.25[1]
						[1] - 0.25 = percent solids in fish to convert to a dry weight ingestion rate
Water Ingestion Rate (g/g-day)	A B	0.045		Conservative value:	0.116 L/day	Ingestion rate * Maximum Body weight
				Average value	0.104 L/day	Ingestion rate * Average Body weight

Notes:
A = Adult
F = Female, M = Male, B = Both
BW = Body Weight

SOIL SCREENING LEVELS
NUSC DISPOSAL AREA
NAVAL STATION NEWPORT, RHODE ISLAND

Chemical	CAS	Screening Level	Source
Volatile Organics (ug/kg)			
1,2,4-TRIMETHYLBENZENE	95-63-6		
1,3,5-TRIMETHYLBENZENE	108-67-8		
2-BUTANONE	78-93-3		
4-ISOPROPYLTOLUENE	99-87-6		
ACETONE	67-64-1		
M+P-XYLENES	TTNUS054	1000	SQG
N-BUTYLBENZENE	104-51-8		
N-PROPYLBENZENE	103-65-1		
O-XYLENE	95-47-6	1000	SQG
Semivolatile Organics (ug/kg)			
3,3'-DICHLOROBENZIDINE	91-94-1		
ACENAPHTHENE	83-32-9	20000	ORNL-plant
ACENAPHTHYLENE	208-96-8	700(1)	SQG
ANTHRACENE	120-12-7	700(1)	SQG
BENZO(A)ANTHRACENE	56-55-3	700(1)	SQG
BENZO(A)PYRENE	50-32-8	700	SQG
BENZO(B)FLUORANTHENE	205-99-2	700(1)	SQG
BENZO(G,H,I)PERYLENE	191-24-2	700(1)	SQG
BENZO(K)FLUORANTHENE	207-08-9	700(1)	SQG
BENZOIC ACID	65-85-0		
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	100000	ORNL-plant
CARBAZOLE	86-74-8		
CHRYSENE	218-01-9	700(1)	SQG
DIBENZO(A,H)ANTHRACENE	53-70-3	700(1)	SQG
DIBENZOFURAN	132-64-9		
FLUORANTHENE	206-44-0	700(1)	SQG
FLUORENE	86-73-7	30000	ORNL-invert
INDENO(1,2,3-CD)PYRENE	193-39-5	700(1)	SQG
NAPHTHALENE	91-20-3	600	SQG
PHENANTHRENE	85-01-8	700(1)	SQG
PYRENE	129-00-0	700(1)	SQG
TOTAL PAHs		1000	TV
Pesticides/PCBs (ug/kg)			
AROCLOR-1254	11097-69-1	40000(2)	ORNL-plant
AROCLOR-1260	11096-82-5		
AROCLOR-1268	11100-14-4		
4,4'-DDE	72-55-9	10(2)	TV
4,4'-DDT	50-29-3		
ALPHA-CHLORDANE	5103-71-9	0.03	TV
Metals (mg/kg)			
ALUMINUM	7429-90-5	50	ORNL-plant
ANTIMONY	7440-36-0	78	Eco SSL
ARSENIC	7440-38-2	10	ORNL-plant

SOIL SCREENING LEVELS
NUSC DISPOSAL AREA
NAVAL STATION NEWPORT, RHODE ISLAND

Chemical	CAS	Screening Level	Source
BARIUM	7440-39-3	330	Eco SSL
BERYLLIUM	7440-41-7	40	Eco SSL
CADMIUM	7440-43-9	32	Eco SSL
CALCIUM	7440-70-2		
CHROMIUM	7440-47-3	0.4	ORNL-invert
COBALT	7440-48-4	13	Eco SSL
COPPER	7440-50-8	50	ORNL-invert
IRON	7439-89-6		
LEAD	7439-92-1	115	Eco SSL
MAGNESIUM	7439-95-4		
MANGANESE	7439-96-5	500	ORNL-plant
MERCURY	7439-97-6	0.1	ORNL-invert
MOLYBDENUM	7439-98-7	3	TV
NICKEL	7440-02-0	30	ORNL-plant
POTASSIUM	7440-09-7		
SELENIUM	7782-49-2	1	ORNL-plant
SILVER	7440-22-4	2	ORNL-plant
VANADIUM	7440-62-2	2	ORNL-plant
ZINC	7440-66-6	50	ORNL-plant

Footnotes:
(1) - Benzo(a)pyrene is used as a surrogate.
(2) - Total value.

Acronyms:
PAH = Polycyclic Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl

Sources:
ORNL-plant = Efroymson, R.A., M.E. Will, G.W. Suter II, and A.C. Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. Oak Ridge National Laboratory. November. ES/ER/TM-85/R3 and ES/ER/TM-126/R2.

ORNL-invert = Efroymson, R.A., M.E. Will, and G.W. Suter II. 1997. Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. Oak Ridge National Laboratory. November. ES/ER/TM-126/R2.

SQG = CCME, 1997. Recommended Canadian Soil Quality Guidelines. Canadian Council of Ministers of the Environment. Ottawa, Ontario. March.

TV = MHSPE, 2000. Circular on target values and intervention values for soil remediation. Ministry of Housing, Spatial Planning, and Environment. DBO/1999226863. Department of Soil Protection, The Netherlands. February 4.

Eco SSL = USEPA Ecological Soil Screening Levels, August 2003. http://www.epa.gov/ecotox/ecossl

APPENDIX G-3
TOXICITY REFERENCE VALUES

PARAMETER	Mammal		Bird	
	NOAEL	LOAEL	NOAEL	LOAEL
SEMIVOLATILES (mg/kg)				
Acenaphthene	17.5	35	2	20
Acenaphthylene	70	700	2	20
Anthracene	100	1000	2	20
Benzo(a)anthracene	0.17	1.7	2	20
Benzo(a)pyrene	1	10	2	20
Benzo(b)fluoranthene	4	40	2	20
Benzo(g,h,i)perylene	7.2	72	2	20
Benzo(k)fluoranthene	7.2	72	2	20
Chrysene	0.17	1.7	2	20
Dibenzo(a,h)anthracene	1.33	13.3	2	20
Fluoranthene	12.5	25	2	20
Fluorene	12.5	25	2	20
Indeno(1,2,3-cd)pyrene	7.2	72	2	20
Phenanthrene	1	10	2	20
Pyrene	7.5	12.5	2	20
PESTICIDES/PCBs (mg/kg)				
4,4'-DDD	0.8	4	0.0028	0.028
4,4'-DDE	0.8	4	0.0028	0.028
4,4'-DDT	0.8	4	0.0028	0.028
Alpha-Chlordane	4.58	9.16	2.14	10.7
Aroclor-1254	0.068	0.68	0.18	1.8
Aroclor-1260	0.068	0.68	0.18	1.8
Aroclor-1268	0.068	0.68	0.18	1.8
Dieldrin	0.02	0.2	0.077	0.77
INORGANICS (mg/kg)				
Arsenic	0.126	1.26	2.46	7.38
Cadmium	1	10	1.45	20
Chromium	3.28	13.14	1	5
Copper	11.71	15.14	46.97	61.72
Lead	8	80	1.13	11.3
Mercury	0.032	0.16	0.0064	0.064
Nickel	40	80	77.4	107
Selenium	0.2	0.33	0.4	0.8
Silver	2.38	23.8	5.44	54.4
Zinc	160	320	14.49	130.9

Notes:

Units are in mg/kg-day

The sources of these NOAELS and LOAELS are presented in the table titled "Sources and Endpoints for NOAELS and LOAELS for Terrestrial Wildlife" in this appendix.

The NOAELS and LOAELS in the source table were divided by 10 if a subchronic study was the basis for the value. Also, if only a NOAEL was available, the value was multiplied by 10 to estimate the LOAEL. If only a LOAEL was available, the value was divided by 10 to estimate the NOAEL.

SOURCES AND ENPOINTS FOR NOAELS AND LOAELS FOR TERRESTRIAL WILDLIFE

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NOTE: Some of the references in this list are not referenced in the proceeding table. This reference list also includes other toxicity values not used in the development of the terrestrial reference values.

APPENDIX G-3
SOURCES AND ENDPOINTS FOR NOAELS AND LOAELS FOR TERRESTRIAL WILDLIFE

Parameters	Units (mg/kg-day)	Endpoint	Effect	Chronic/ Subchronic	Species	Primary Reference	Source of Reference
Semivolatiles Organics							
Acenaphthene	175	NOAEL	systemic	subchronic	mouse	USEPA, 1989a	IRIS, 2002
Acenaphthene	350	LOAEL	systemic	subchronic	mouse	USEPA, 1989a	IRIS, 2002
Acenaphthylene	700	NOAEL	mortality/BW	subchronic	mouse	USEPA, 1989a	PRC, 1996
Anthracene	1000	NOAEL	systemic	subchronic	mouse	USEPA, 1989b	IRIS, 2002
Anthracene	1000	NOAEL	reproductive	Subchronic	mouse	USEPA, 1989b	IT Corp, 1997
Benzo(a)anthracene	17.1	NOAEL	carcinogenic	acute	mouse	Clayson et al., 1968	PRC, 1996
Benzo(a)pyrene	10	LOAEL	reproductive	chronic	mouse	Mackenzie and Angevine, 1981	Sample et.al., 1996
Benzo(b)fluoranthene	40	LOAEL	carcinogenic	chronic	rodent	Lo and Sandi, 1978	PRC, 1996
Benzo(g,h,i)perylene	72	LOAEL	carcinogenic	chronic	rodent	Simms and Overcash, 1983	PRC, 1996
Benzo(k)fluoranthene	72	LOAEL	carcinogenic	chronic	rodent	Lo and Sandi, 1978	PRC, 1996
Chrysene	17.1	NOAEL	carcinogenic	acute	mouse	Clayson et al., 1968	PRC, 1996
Dibenzo(a,h)anthracene	13.3	LOAEL	carcinogenic	chronic	mouse	Lorenz and Stewart, 1948	PRC, 1996
Fluoranthene	125	NOAEL	systemic	subchronic	mouse	USEPA, 1988	IRIS, 2002
Fluoranthene	250	LOAEL	systemic	subchronic	mouse	USEPA, 1988	IRIS, 2002
Fluorene	125	NOAEL	systemic	subchronic	mouse	USEPA, 1989c	IRIS, 2002
Fluorene	250	LOAEL	systemic	subchronic	mouse	USEPA, 1989c	IRIS, 2002
Indeno(1,2,3-cd)pyrene	72	LOAEL	carcinogenic	chronic	rodent	Simms and Overcash, 1983	PRC, 1996
Pyrene	75	NOAEL	systemic	subchronic	mouse	USEPA, 1989c	IRIS, 2002
Pyrene	125	LOAEL	systemic	subchronic	mouse	USEPA, 1989c	IRIS, 2002
Pesticides/PCBs							
Chlordane	2.14	NOAEL	mortality	chronic	red-winged blackbird	Stickel et al., 1983	Sample et.al., 1996
Chlordane	10.7	LOAEL	mortality	chronic	red-winged blackbird	Stickel et al., 1983	Sample et.al., 1996
Chlordane	4.58	NOAEL	reproduction	chronic	mouse	WHO, 1984	Sample et.al., 1996
Chlordane	9.16	LOAEL	reproduction	chronic	mouse	WHO, 1984	Sample et.al., 1996
4,4'-DDT	0.8	NOAEL	reproductive	chronic	rat	Fitzhugh, 1948	Sample et.al., 1996
4,4'-DDT	4	LOAEL	reproductive	chronic	rat	Fitzhugh, 1948	Sample et.al., 1996
4,4'-DDT	0.052[1]	LOAEL	reproduction	chronic	brown pelican	Anderson et al., 1975	USEPA, 1995
4,4'-DDT	0.009[1]	NOAEL	reproduction	chronic	brown pelican	Anderson et al., 1975	USEPA, 1995
Dieldrin	0.077	NOAEL	reproduction	chronic	barn owl	Mendenhall et al., 1983	Sample et.al., 1996
Dieldrin	0.2	LOAEL	reproduction	chronic	rat	Treon and Cleveland, 1955	Sample et.al., 1996
Aroclor-1254	1.8	LOAEL	reproductive	chronic	pheasant	Dahlgren et al., 1972	Sample et.al., 1996
Aroclor-1254	0.68	LOAEL	reproduction	chronic	mouse	McCoy et al., 1995	Sample et.al., 1996
Inorganics							
Arsenic	1.261	LOAEL	reproductive	chronic	mouse	Schroeder and Mitchner, 1971	Sample et.al., 1996
Arsenic	2.46	NOAEL	mortality	chronic	brown-headed cowbird	USFWS, 1969	Sample et.al., 1996
Arsenic	7.38	LOAEL	mortality	chronic	brown-headed cowbird	USFWS, 1969	Sample et.al., 1996
Cadmium	1	NOAEL	reproductive	chronic	rat	Sutou et al., 1980	Sample et.al., 1996
Cadmium	10	LOAEL	reproductive	chronic	rat	Sutou et al., 1980	Sample et.al., 1996
Cadmium	1.45	NOAEL	reproductive	chronic	mallard duck	White and Finely, 1978	Sample et.al., 1996
Cadmium	20	LOAEL	reproductive	chronic	mallard duck	White and Finely, 1978	Sample et.al., 1996
Chromium(III)	1	NOAEL	reproductive	chronic	black duck	Haseltine et al., unpubl.	Sample et.al., 1996
Chromium(III)	5	LOAEL	reproductive	chronic	black duck	Haseltine et al., unpubl.	Sample et.al., 1996
Chromium(VI)	3.28	NOAEL	BW/food cons.	chronic	rat	Mackenzie et al., 1958	Sample et.al., 1996
Chromium(VI)	131.4	LOAEL	mortality	subchronic	rat	Steven et al., 1976	Sample et.al., 1996
Copper	11.71	NOAEL	reproductive	chronic	mink	Aulerich et al., 1982	ATSDR, 1989
Copper	15.14	LOAEL	reproductive	chronic	mink	Aulerich et al., 1982	ATSDR, 1989
Copper	46.97	NOAEL	mortality	chronic	chicks	Mehring et al., 1960	Sample et.al., 1996
Copper	61.72	LOAEL	mortality	chronic	chicks	Mehring et al., 1960	Sample et.al., 1996
Lead	8	NOAEL	reproductive	chronic	rat	Azar et al., 1973	Sample et.al., 1996
Lead	80	LOAEL	reproductive	chronic	rat	Azar et al., 1973	Sample et.al., 1996
Lead	1.13	NOAEL	reproductive	chronic	Japanese quail	Edens et al., 1976	Sample et.al., 1996
Lead	11.3	LOAEL	reproductive	chronic	Japanese quail	Edens et al., 1976	Sample et.al., 1996
Mercury	0.064	LOAEL	reproductive	chronic	mallard duck	Heinz, 1979	Sample et.al., 1996
Mercury	0.032	NOAEL	reproductive	chronic	rat	Verschuuren et al., 1976	Sample et.al., 1996
Mercury	0.16	LOAEL	reproductive	chronic	rat	Verschuuren et al., 1976	Sample et.al., 1996
Nickel	40	NOAEL	reproductive	chronic	rat	Ambrose et al., 1976	Sample et.al., 1996
Nickel	80	LOAEL	reproductive	chronic	rat	Ambrose et al., 1976	Sample et.al., 1996
Nickel	77.4	NOAEL	mortality	chronic	mallard duck	Cain and Pafford, 1981	Sample et.al., 1996
Nickel	107	LOAEL	mortality	chronic	mallard duck	Cain and Pafford, 1981	Sample et.al., 1996
Selenium	0.4	NOAEL	reproductive	chronic	mallard duck	Heinz et al., 1989	Sample et.al., 1996
Selenium	0.8	LOAEL	reproductive	chronic	mallard duck	Heinz et al., 1989	Sample et.al., 1996
Selenium	0.2	NOAEL	reproductive	chronic	rat	Rosenfeld and Beath, 1954	Sample et.al., 1996
Selenium	0.33	LOAEL	reproductive	chronic	rat	Rosenfeld and Beath, 1954	Sample et.al., 1996
Silver	54.4	LOAEL	survival	chronic	chicks	Peterson and Jensen, 1975	
Silver	23.81	LOAEL	weight loss	chronic	mouse	Rungby and Danscher, 1984	
Zinc	160	NOAEL	reproductive	chronic	rat	Schlicker and Cox, 1968	Sample et.al., 1996
Zinc	320	LOAEL	reproductive	chronic	rat	Schlicker and Cox, 1968	Sample et.al., 1996
Zinc	14.49	NOAEL	reproductive	chronic	white leghorn hen	Stahl et al., 1990	Sample et.al., 1996
Zinc	130.9	LOAEL	reproductive	chronic	white leghorn hen	Stahl et al., 1990	Sample et.al., 1996

Notes: The NOAELS and LOAELS for the PAHs that do not have values are based on the benzo(a)pyrene values
The NOAELS and LOAELS for the PAHs for birds were based on 7,12-dimethylbenz(a)anthracene.

1 - The LOAEL of 0.052 mg/kg-day was the recalculated LOEAL for the referenced study by assumming a lag time for the reduction of DDT (see USEPA, 1995)
The NOAEL of 0.009 was calculated by dividing the original LOAEL of the referenced study (0.027 mg/kg-day by an uncertainty factor of 3.

APPENDIX G-4
DRY WEIGHT BAFS AND/OR BSAFS FOR PLANTS, EARTHWORMS, AND FISH

Chemicals	Plant BAFs[1,2]		Earthworm BAFs[3]		Fish BSAFs[4]	
	Conservative[5]	Average[5]	Conservative[5]	Average[5]	Conservative[5]	Average[5]
Semivolatile Organics						
Acenaphthene	1.20E-01	1.20E-01	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Acenaphthylene	2.70E-01	2.70E-01	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Anthracene	1.10E-01	1.10E-01	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Benzo(a)anthracene	1.90E-02	1.90E-02	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Benzo(a)pyrene	1.10E-02	1.10E-02	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Benzo(b)fluoranthene	1.10E-02	1.10E-02	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Benzo(g,h,i)perylene	5.60E-03	5.60E-03	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Benzo(k)Fluoranthene	4.30E-03	4.30E-03	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Chrysene	1.90E-02	1.90E-02	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Dibenzo(a,h)Anthracene	4.30E-03	4.30E-03	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Fluoranthene	5.50E-02	5.50E-02	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Fluorene	1.10E-01	1.10E-01	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Indeno(1,2,3-cd)pyrene	5.60E-03	5.60E-03	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Phenanthrene	8.20E-02	8.20E-02	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Pyrene	5.50E-02	5.50E-02	6.69E-01	2.56E-01	2.90E-01	2.90E-01
Pesticides/ PCBs						
4,4'-DDE	1.90E-02	1.90E-02	1.30E+01	1.30E+01	7.70E+00	7.70E+00
4,4'-DDT	7.80E-03	7.80E-03	1.30E+01	1.30E+01	1.67E+00	1.67E+00
Alpha-Chlordane	2.50E-02	2.50E-02	5.00E+00	5.00E+00	4.77E+00	4.77E+00
Aroclor-1254	1.30E-02	1.30E-02	1.59E+01	6.67E+00	1.85E+00	1.85E+00
Aroclor-1260	2.90E-03	2.90E-03	1.59E+01	6.67E+00	1.85E+00	1.85E+00
Dieldrin	8.20E-02	8.20E-02	6.64E+00	6.64E+00	1.80E+00	1.80E+00
Inorganics						
Arsenic	1.10E+00	3.75E-02	5.23E-01	2.24E-01	1.00E+00	1.00E+00
Cadmium	3.25E+00	5.86E-01	4.07E+01	7.71E+00	1.00E+00	1.00E+00
Chromium	8.39E-02	4.10E-02	3.16E+00	3.06E-01	1.00E+00	1.00E+00
Copper	6.25E-01	1.24E-01	1.53E+00	5.15E-01	1.00E+00	1.00E+00
Lead	4.68E-01	3.89E-02	1.52E+00	2.66E-01	1.00E+00	1.00E+00
Mercury	5.00E+00	6.52E-01	2.06E+01	1.69E+00	1.00E+00	1.00E+00
Nickel	1.41E+00	1.80E-02	4.73E+00	1.06E+00	1.00E+00	1.00E+00
Selenium	3.01E+00	6.72E-01	1.34E+00	9.85E-01	1.00E+00	1.00E+00
Silver	3.67E-02	1.40E-02	1.53E+01	2.05E+00	1.00E+00	1.00E+00
Zinc	1.82E+00	3.66E-01	1.29E+01	3.20E+00	1.00E+00	1.00E+00

Notes:
BAF - Bioaccumulation Factor
BSAF - Biota Sediment Accumulation Factor
1 - ORNL (2001) for organics; only one value is available for conservative and average exposures
2 - Sample et al., (1997) for inorganics; conservative value is 90th percentile; average value is median value
3 - ORNL (September, 1998) for all chemicals; conservative value is 90th percentile; average value is median value
4 - U.S. EPA, September 1997; only one value is available for conservative and average exposures. Values for organic chemicals are the same for wet-weight and dry weight.
5 - Conservative and average refers to the exposure scenarios for which the uptake factors are used

Default value of 1 is assigned to parameters without uptake factors

BOBWHITE QUAIL - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
NUSC DISPOSAL AREA - NEWPORT
MIDDLETOWN, RHODE ISLAND

Chemical	Max Soil Concentration (mg/kg)	Max SW Concentration (ug/L)	Biotransfer Factor (soil to veg)	Vegetation Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics									
ACENAPHTHENE	9.60E-01	0.00E+00	1.20E-01	1.15E-01	6.14E-03	2.00E+00	2.00E+01	3.1E-03	3.1E-04
ACENAPHTHYLENE	2.90E-01	0.00E+00	2.70E-01	7.83E-02	3.23E-03	2.00E+00	2.00E+01	1.6E-03	1.6E-04
ANTHRACENE	3.20E+00	0.00E+00	1.10E-01	3.52E-01	1.95E-02	2.00E+00	2.00E+01	9.7E-03	9.7E-04
BENZO(A)ANTHRACENE	8.10E+00	0.00E+00	1.90E-02	1.54E-01	2.59E-02	2.00E+00	2.00E+01	1.3E-02	1.3E-03
BENZO(A)PYRENE	4.80E+00	0.00E+00	1.10E-02	5.28E-02	1.41E-02	2.00E+00	2.00E+01	7.1E-03	7.1E-04
BENZO(B)FLUORANTHENE	4.50E+00	0.00E+00	1.10E-02	4.95E-02	1.33E-02	2.00E+00	2.00E+01	6.6E-03	6.6E-04
BENZO(G,H,I)PERYLENE	2.40E+00	0.00E+00	5.60E-03	1.34E-02	6.66E-03	2.00E+00	2.00E+01	3.3E-03	3.3E-04
BENZO(K)FLUORANTHENE	4.60E+00	0.00E+00	4.30E-03	1.98E-02	1.26E-02	2.00E+00	2.00E+01	6.3E-03	6.3E-04
CHRYSENE	7.90E+00	0.00E+00	1.90E-02	1.50E-01	2.53E-02	2.00E+00	2.00E+01	1.3E-02	1.3E-03
DIBENZO(A,H)ANTHRACENE	1.00E+00	0.00E+00	4.30E-03	4.30E-03	2.73E-03	2.00E+00	2.00E+01	1.4E-03	1.4E-04
FLUORANTHENE	2.10E+01	0.00E+00	5.50E-02	1.16E+00	9.12E-02	2.00E+00	2.00E+01	4.6E-02	4.6E-03
FLUORENE	1.30E+00	0.00E+00	1.10E-01	1.43E-01	7.91E-03	2.00E+00	2.00E+01	4.0E-03	4.0E-04
INDENO(1,2,3-CD)PYRENE	2.50E+00	0.00E+00	5.60E-03	1.40E-02	6.94E-03	2.00E+00	2.00E+01	3.5E-03	3.5E-04
PHENANTHRENE	1.50E+01	0.00E+00	8.20E-02	1.23E+00	7.80E-02	2.00E+00	2.00E+01	3.9E-02	3.9E-03
PYRENE	1.70E+01	0.00E+00	5.50E-02	9.35E-01	7.38E-02	2.00E+00	2.00E+01	3.7E-02	3.7E-03
Pesticides/PCBs									
4,4'-DDE	2.16E-01	1.40E-05	1.90E-02	4.10E-03	6.93E-04	9.00E-03	5.20E-02	7.7E-02	1.3E-02
4,4'-DDT	1.84E-01	3.48E-05	7.80E-03	1.44E-03	5.29E-04	9.00E-03	5.20E-02	5.9E-02	1.0E-02
ALPHA-CHLORDANE	2.35E-01	0.00E+00	2.50E-02	5.88E-03	7.97E-04	2.14E+00	1.07E+01	3.7E-04	7.4E-05
AROCLOR-1254	5.22E+00	0.00E+00	1.30E-02	6.79E-02	1.57E-02	1.80E-01	1.80E+00	8.7E-02	8.7E-03
AROCLOR-1260	1.17E-01	0.00E+00	2.90E-03	3.39E-04	3.15E-04	1.80E-01	1.80E+00	1.7E-03	1.7E-04
AROCLOR-1268	1.34E-01	0.00E+00	2.90E-03	3.89E-04	3.61E-04	1.80E-01	1.80E+00	2.0E-03	2.0E-04
Inorganics									
ARSENIC	9.00E+01	3.80E-03	1.10E+00	9.93E+01	3.38E+00	2.46E+00	7.38E+00	1.4E+00	4.6E-01
CADMIUM	1.10E+01	0.00E+00	3.25E+00	3.58E+01	1.16E+00	1.45E+00	2.00E+01	8.0E-01	5.8E-02
CHROMIUM	6.40E+01	1.30E-03	8.39E-02	5.37E+00	3.37E-01	1.00E+00	5.00E+00	3.4E-01	6.7E-02
COPPER	5.60E+02	3.20E-03	6.25E-01	3.50E+02	1.25E+01	4.70E+01	6.17E+01	2.7E-01	2.0E-01
LEAD	1.60E+02	1.13E-02	4.68E-01	7.49E+01	2.79E+00	1.13E+00	1.13E+01	2.5E+00	2.5E-01
MERCURY	1.40E-01	1.80E-05	5.00E+00	7.00E-01	2.25E-02	6.40E-03	6.40E-02	3.5E+00	3.5E-01
NICKEL	2.60E+01	3.87E-03	1.41E+00	3.67E+01	1.23E+00	7.74E+01	1.07E+02	1.6E-02	1.2E-02
SELENIUM	1.90E-01	0.00E+00	3.01E+00	5.72E-01	1.86E-02	4.00E-01	8.00E-01	4.7E-02	2.3E-02
SILVER	2.00E+00	0.00E+00	3.67E-02	7.34E-02	7.52E-03	5.44E+00	5.44E+01	1.4E-03	1.4E-04
ZINC	2.80E+02	8.50E-03	1.82E+00	5.10E+02	1.69E+01	1.45E+01	1.31E+02	1.2E+00	1.3E-01

Body Weight = (BW)	1.54E-01	kg
Food Ingestion Rate = (If)	4.88E-03	kg/day
Water Ingestion Rate = (Iw)	2.28E-02	L/day
Soil Ingestion Rate = (Is)	4.00E-04	kg/day

Dose=(If*Cv+Is*Cs+Iw*Cw)/BW

Cv = Contaminant conc. in vegetation (=soil conc. * Biotransfer Factor)
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in surface water

Cells are shaded if the value is greater than 1.0

Definitions:
EEQ - Ecological Effects Quotient
LOAEL - Lowest Observed Effects Level
NOAEL - No Observed Effects Level
PCB - Polychlorinated Biphenyl
SW - Surface Water

BOBWHITE QUAIL - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
NUSC DISPOSAL AREA - NEWPORT
MIDDLETOWN, RHODE ISLAND

Chemical	Avg Soil Concentration (mg/kg)	Avg SW Concentration (ug/L)	Biotransfer Factor (soil to veg)	Vegetation Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL EEQ	LOAEL EEQ
Semivolatile Organics									
ACENAPHTHENE	1.40E-01	0.00E+00	1.20E-01	1.68E-02	6.59E-04	2.00E+00	2.00E+01	3.3E-04	3.3E-05
ACENAPHTHYLENE	7.60E-02	0.00E+00	2.70E-01	2.05E-02	6.23E-04	2.00E+00	2.00E+01	3.1E-04	3.1E-05
ANTHRACENE	4.20E-01	0.00E+00	1.10E-01	4.62E-02	1.88E-03	2.00E+00	2.00E+01	9.4E-04	9.4E-05
BENZO(A)ANTHRACENE	1.10E+00	0.00E+00	1.90E-02	2.09E-02	2.59E-03	2.00E+00	2.00E+01	1.3E-03	1.3E-04
BENZO(A)PYRENE	7.20E-01	0.00E+00	1.10E-02	7.92E-03	1.56E-03	2.00E+00	2.00E+01	7.8E-04	7.8E-05
BENZO(B)FLUORANTHENE	7.60E-01	0.00E+00	1.10E-02	8.36E-03	1.65E-03	2.00E+00	2.00E+01	8.2E-04	8.2E-05
BENZO(G,H,I)PERYLENE	4.50E-01	0.00E+00	5.60E-03	2.52E-03	9.19E-04	2.00E+00	2.00E+01	4.6E-04	4.6E-05
BENZO(K)FLUORANTHENE	7.30E-01	0.00E+00	4.30E-03	3.14E-03	1.47E-03	2.00E+00	2.00E+01	7.3E-04	7.3E-05
CHRYSENE	1.10E+00	0.00E+00	1.90E-02	2.09E-02	2.59E-03	2.00E+00	2.00E+01	1.3E-03	1.3E-04
DIBENZO(A,H)ANTHRACENE	1.80E-01	0.00E+00	4.30E-03	7.74E-04	3.62E-04	2.00E+00	2.00E+01	1.8E-04	1.8E-05
FLUORANTHENE	2.60E+00	0.00E+00	5.50E-02	1.43E-01	8.30E-03	2.00E+00	2.00E+01	4.1E-03	4.1E-04
FLUORENE	1.70E-01	0.00E+00	1.10E-01	1.87E-02	7.61E-04	2.00E+00	2.00E+01	3.8E-04	3.8E-05
INDENO(1,2,3-CD)PYRENE	4.30E-01	0.00E+00	5.60E-03	2.41E-03	8.78E-04	2.00E+00	2.00E+01	4.4E-04	4.4E-05
PHENANTHRENE	1.80E+00	0.00E+00	8.20E-02	1.48E-01	6.88E-03	2.00E+00	2.00E+01	3.4E-03	3.4E-04
PYRENE	2.20E+00	0.00E+00	5.50E-02	1.21E-01	7.02E-03	2.00E+00	2.00E+01	3.5E-03	3.5E-04
Pesticides/PCBs									
4,4'-DDE	2.30E-02	3.40E-06	1.90E-02	4.37E-04	5.45E-05	9.00E-03	5.20E-02	6.1E-03	1.0E-03
4,4'-DDT	2.80E-02	3.20E-06	7.80E-03	2.18E-04	5.89E-05	9.00E-03	5.20E-02	6.5E-03	1.1E-03
ALPHA-CHLORDANE	2.20E-02	0.00E+00	2.50E-02	5.50E-04	5.49E-05	2.14E+00	1.07E+01	2.6E-05	5.1E-06
AROCLOR-1254	3.70E-01	0.00E+00	1.30E-02	4.81E-03	8.19E-04	1.80E-01	1.80E+00	4.6E-03	4.6E-04
AROCLOR-1260	2.70E-02	0.00E+00	2.90E-03	7.83E-05	5.34E-05	1.80E-01	1.80E+00	3.0E-04	3.0E-05
AROCLOR-1268	2.00E-02	0.00E+00	2.90E-03	5.80E-05	3.96E-05	1.80E-01	1.80E+00	2.2E-04	2.2E-05
Inorganics									
ARSENIC	2.08E+01	1.90E-03	3.75E-02	7.80E-01	5.81E-02	2.46E+00	7.38E+00	2.4E-02	7.9E-03
CADMIUM	9.50E-01	0.00E+00	5.86E-01	5.57E-01	1.48E-02	1.45E+00	2.00E+01	1.0E-02	7.4E-04
CHROMIUM	1.49E+01	7.40E-04	4.10E-02	6.11E-01	4.28E-02	1.00E+00	5.00E+00	4.3E-02	8.6E-03
COPPER	5.76E+01	1.90E-03	1.24E-01	7.14E+00	2.77E-01	4.70E+01	6.17E+01	5.9E-03	4.5E-03
LEAD	3.90E+01	2.10E-03	3.89E-02	1.52E+00	1.10E-01	1.13E+00	1.13E+01	9.7E-02	9.7E-03
MERCURY	6.20E-02	1.00E-05	6.52E-01	4.04E-02	1.06E-03	6.40E-03	6.40E-02	1.7E-01	1.7E-02
NICKEL	1.67E+01	2.70E-03	1.80E-02	3.01E-01	3.92E-02	7.74E+01	1.07E+02	5.1E-04	3.7E-04
SELENIUM	6.80E-02	0.00E+00	6.72E-01	4.57E-02	1.19E-03	4.00E-01	8.00E-01	3.0E-03	1.5E-03
SILVER	2.80E-01	0.00E+00	1.40E-02	3.92E-03	6.26E-04	5.44E+00	5.44E+01	1.2E-04	1.2E-05
ZINC	7.23E+01	4.10E-03	3.66E-01	2.65E+01	7.55E-01	1.45E+01	1.31E+02	5.2E-02	5.8E-03

Body Weight = (BW)	1.75E-01	kg
Food Ingestion Rate = (If)	4.08E-03	kg/day
Water Ingestion Rate = (Iw)	1.93E-02	L/day
Soil Ingestion Rate = (Is)	3.35E-04	kg/day

Dose=(If*Cv+Is*Cs+Iw*Cw)/BW

Cv = Contaminant conc. in vegetation (=soil conc. * Biotransfer Factor)
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in surface water

Definitions:
EEQ - Ecological Effects Quotient
LOAEL - Lowest Observed Effects Level
NOAEL - No Observed Effects Level
PCB - Polychlorinated Biphenyl
SW - Surface Water

OBSERVED SPECIES LISTS
NUSC DISPOSAL SITE STUDY AREA
MIDDLETOWN, RHODE ISLAND
August 4 – 8, 2003

UPLAND PLANTS

Common Name	Scientific Name
Autumn olive	*Elaegnus umbellate*
Bayberry, Northern	*Myrica pennsylvanica*
Bittersweet	*Celastrus scandens*
Black cherry	*Prunus serotina*
Black locust	*Robinia pseudoacacia*
Blackberry	*Rubus Allegheniensis*
Bracken fern	*Pteridium aquilinum*
Broomsedge	*Andropogon virginicus*
Chicory	*Cichorium intybus*
Choke cherry	*Prunus virginiana*
Common mullein	*Verbascum thapsus*
Common plantain	*Plantago sp.*
Common ragweed	*Ambrosiaartemiisifolia*
Common yarrow	*Achillea millefolium*
Crownvetch	*Coronilla varia*
Eastern Red Cedar	*Juniperus virginiana*
Grape	*Vitis spp.*
Gray birch	*Betula populifolia*
Greenbriar	*Smilax rotundifolia*
Hawthorne	*Cretaegus sp.*
Hazelnut, American	*Corylus Americana*
Honeysuckle, Bush	*Lonicera tatarica*
Honeysuckle, Japanese	*Lonicera japonica*
Honeysuckle, tartarian	*Lonicera tatarica*
Japanese knotweed	*Polygonum cuspidatum**

APPENDIX A
OBSERVED SPECIES LISTS
NUSC DISPOSAL AREA
MIDDLETOWN, RHODE ISLAND
August 4 – 8, 2003

UPLAND PLANTS

Common Name	Scientific Name
Knapweed, Black	*Centaurea maculosa*
Lance-leaved goldenrod	*Euthamia graminifolia*
Milkweed, Common	*Asclepias syriaca*
Morning glory	*Convolvulus arvensis*
Multiflora rose	*Rosa multiflora*
Norway maple	*Acer platonoides*
Poison ivy	*Toxicodendron radicans*
Pokeweed	*Phytolacca Americana*
Quaking aspen	*Populus tremuloides*
Queen Anne's lace	*Daucus carota*
Red maple	*Acer rubrum*
Red oak, northern	*Quercus rubra*
Rough-stemmed goldenrod	*Solidago rugosa*
Slippery elm	*Ulmus rubra*
Smooth sumac	*Rhus glabra*
Speckled alder	*Alnus rugosa*
Staghorn sumac	*Rhus typhina*
Sycamore maple	*Acer pseudoplatanus*
Tall fescue	*Festuca arundinacea*
Tansy	*Tanicetum vulgare*
White pine	*Pinus strobes*
White sweet clover	*Melilotis alba*
Willow	*Salix sp.*
Witch-hazel, common	*Hamamelis virginiana*

APPENDIX A
OBSERVED SPECIES LISTS
NUSC DISPOSAL AREA
MIDDLETOWN, RHODE ISLAND
August 4 – 8, 2003

STREAM VALLEY/POND WETLAND PLANTS

Common Name	Scientific Name
Black cherry	*Prunus serotina*
Arrow-leaved tearthumb	*Polygonum sagittatum*
Bittersweet	*Celastrus scandens*
Bittersweet nightshade	*Solanum dulcamura*
Blue flag	*Iris versicolor*
Blue vervain	*Verbena hastate*
Cattail, Common	*Typha latifolia*
Choke cherry	*Prunus virginiana*
Cinnamon fern	*Osmunda cinnamomea*
Duckweed	*Lemna minor*
Eastern cottonwood	*Populus deltoids*
Elderberry	*Sambucus canadensis*
Goldenrod, Tall	*Solidago altissima*
Goldenrods, other	*Solidago spp.*
Jewelweed	*Impatiens capensis*
Maleberry	*Lyonia ligustrina*
marsh fern	*Thelypteris thelypteroides*
Meadowsweet	*Spirea latifolia*
Meadowsweet	*Spirea spp.*
Morning glory	*Convolvulus arvensis*
Morning glory	*Convolvulus arvensis*
Multiflora rose	*Rosa multiflora*
Nannyberry	*Viburnum lentago*
Northern arrowood	*Viburnum recognitum*
Poison-ivy	*Toxicodendron radicans*
Pondweeds	*Potamgeton spp.*

APPENDIX A
OBSERVED SPECIES LISTS
NUSC DISPOSAL AREA
MIDDLETOWN, RHODE ISLAND
August 4 – 8, 2003

STREAM VALLEY/POND WETLAND PLANTS

Common Name	Scientific Name
Purple loosestrife	*Lythrum salicaria*
Red maple	*Acer rubrum*
Red oak, northern	*Quercus rubra*
Reed canary grass	*Phalaris arundinacea*
Rought-stemmed goldenrod	*Solidago rugosa*
Scirpus (unidentified)	*Scirpu sp.*
Sensitive fern	*Onoclea sensibilis*
Silky dogwood	*Cornus amomum*
Skunk cabbage	*Symplocarpus foetidus*
Smartweed	*Polygonum sp.*
Soft rush	*Juncus effuses*
Speckled alder	*Alnus rugosa*
Steeplebush	*Spiraea tomentosa*
Stinging nettle	*Urtica dioica*
Swamp-beggar's tick	*Bidens connata*
Sweet goldenrod	*Solidago odorata*
Tall meadow-rue	*Thalictrum pubescens*
Wild rice	*Zizania aquatica*
White oak	*Quercus alba*
Willow	*Salix sp.*
Witch-hazel, Common	*Hamamelis virginiana*
Witch-hazel, common	*Hamamelis virginiana*
Wood anemone	*Anemone quinquefolia*
Wool-grass	*Scirpus cyperinus*