N00174.AR.001099
NSWC INDIAN HEAD
5090.3a

ENGINEERING EVALUATION/ COST ANALYSIS FOR SITE 57 NSWC INDIAN HEAD MD
8/1/2005
TETRA TECH

Engineering Evaluation/ Cost Analysis
for
Site 57 – Building 292 TCE Contamination

Naval District Washington, Indian Head
Indian Head, Maryland

Naval Facilities Engineering Command
NAVFAC WASHINGTON

Naval Facilities Engineering Command Washington

Contract Number N62472-03-D-0057

Contract Task Order 005

August 2005

ENGINEERING EVALUATION/COST ANALYSIS FOR SITE 57 - BUILDING 292 TCE CONTAMINATION

NAVAL DISTRICT WASHINGTON, INDIAN HEAD
INDIAN HEAD, MARYLAND

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Naval Facilities Engineering Command Washington
1314 Harwood Street, S.E.
Washington Navy Yard, D.C. 20374-5018

Submitted by:
Tetra Tech NUS, Inc.
600 Clark Avenue, Suite 3
King of Prussia, Pennsylvania 19406-1433

CONTRACT NUMBER N62472-03-D-0057
CONTRACT TASK ORDER 005

AUGUST 2005

PREPARED UNDER DIRECTION OF:

GEORGE J. LATULIPPE, P.E.
PROJECT MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA

APPROVED FOR SUBMISSION BY:

JOHN J. TREPANOWSKI, P.E.
PROGRAM MANAGER
TETRA TECH NUS, INC.
KING OF PRUSSIA, PENNSYLVANIA

TABLE OF CONTENTS

TABLE OF CONTENTS

SECTION | **PAGE NO.**

TABLES

SECTION

FIGURES

SECTION

ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or relevant and appropriate requirement
B&R Environmental	Brown and Root Environmental
bgs	Below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	Chemical of concern
COMAR	Code of Maryland Regulations
COPC	Chemical of potential concern
CTE	Central tendency exposure
CTO	Contract Task Order
DAF	Dilution attenuation factor
DCE	Dichloroethene
E.O.	Executive Order
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
FS	Feasibility Study
HI	Hazard index
IHDIV-NSWC	Indian Head Division, Naval Surface Warfare Center
LDR	Land disposal restriction
MDE	Maryland Department of the Environment
µg/kg	Microgram per kilogram
µg/L	Microgram per liter
mg/kg	Milligram per kilogram
MPE	Multi-phase extraction
msl	Mean sea level
NA	Not applicable
NAVFAC	Naval Facilities Engineering Command
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDW-IH	Naval District Washington, Indian Head
O&M	Operation and maintenance
OSHA	Occupational Safety and Health Act
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PRG	Preliminary remediation goal

RAO	Removal action objective
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
SSL	Soil Screening Level
SVE	Soil vapor extraction
SVOC	Semivolatile organic compound
TAL	Target Analyte List
TBC	To be considered
TCE	Trichloroethene
TCL	Target Compound List
TOC	Total organic carbon
TSD	Treatment, storage, and disposal
TtNUS	Tetra Tech NUS, Inc.
UCL	Upper confidence limit
USC	Unite States Code
VOC	Volatile organic compound

EXECUTIVE SUMMARY

This report summarizes the results of the Engineering Evaluation/Cost Analysis (EE/CA) for Site 57, Building 292 TCE Contamination, at Naval District Washington, Indian Head (NDW-IH) located in Indian Head, Maryland. The EE/CA was prepared for the Naval Facilities Engineering Command (NAVFAC) Washington by Tetra Tech NUS, Inc. (TtNUS) in response to Contract Task Order (CTO) 0005 under Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N62472-03-D-0057. The purpose of the EE/CA is to develop and evaluate potential removal action alternatives for a non-time-critical removal action to address contaminated soil. Environmental data collected for the site was presented in a Remedial Investigation (RI) Report (TtNUS, 2000) and a draft Feasibility Study (FS) Report (TtNUS, 2002). The RI report also evaluated potential risks to human health and the environment resulting from on-site contamination. The draft FS report evaluated remedial action alternatives for both soil and groundwater. However, additional data and treatability studies were needed to fully develop and evaluate remedial alternatives for groundwater. Therefore, the Navy decided to address the soil contamination while the groundwater studies were being conducted. This EE/CA presents removal action alternatives that address the potential risks associated with contaminated soil located south of Building 292 at the Main Area of the NDW-IH. Other site media will be addressed in a future document.

Previous operations at Site 57 from the mid-1960s until 1989 involved the use of trichloroethene (TCE) for vapor degreasing and general cleaning. During the 1970s and 1980s, spent TCE was transferred from a tank inside Building 292 into drums via a pipe that passed through the wall near the southern corner of the building. The drums were reportedly stored on a grass-covered area near manhole MH-1. It is believed that these operations have resulted in the contamination of soil and groundwater. The use of TCE at Building 292 stopped in 1989. The spent TCE was determined to be United States Environmental Protection Agency (EPA) hazardous waste number F002. Site 57 also includes Buildings 165 and 496, both located approximately 150 feet southwest of Building 292, which were used to store ethyl ether.

SITE RISKS

Although groundwater, surface water, and sediment samples have been collected at Site 57, this discussion will focus on the nature and extent of soil contamination and risks to human health and the environment associated with exposure to contaminated soil.

Preliminary investigations conducted at Site 57 in February 1994 and May 1994 identified TCE in soil at concentrations greater than screening levels. The Navy conducted additional rounds of sampling and analysis for TCE in an attempt to locate the source of this chemical. Sample results from July 1994 did not detect TCE or any other volatile organic priority pollutants in storm sewers upstream of Building 292.

However, TCE was detected at manhole MH-1 immediately downgradient of the building and more than 1,300 feet downstream of the building at the industrial wastewater/stormwater outfall (designated IW-80). No other volatile organic priority pollutants were detected during sampling.

A soil-gas survey was conducted in September 1995. The location with the highest concentration of TCE was near the southern corner of Building 292, near where drums were filled and stored. Generally, concentrations decreased with distance from the building.

RI field investigations were conducted in October 1998 and January 1999 to further delineate the nature and extent of contamination. TCE and several other chlorinated hydrocarbons and metals were detected in downgradient soil. TCE and one of its degradation products, cis-1,2-dichloroethene (cis-1,2-DCE), were typically detected with the greatest frequency and at the highest concentrations. Arsenic was detected in soil at a concentration higher than EPA and State screening levels for migration of chemicals from soil to groundwater; however, arsenic was not detected in any groundwater samples.

A baseline human health risk assessment was developed in the RI Report. Unacceptable risks were identified for future construction workers exposed to soil and for hypothetical future residents exposed to soil and groundwater. Chemicals of concern (COCs) are based on protection of human health, protection of the environment, and/or exceedances of regulatory standards. The only soil COC based on protection of human health is arsenic. Soil COCs based on protection of groundwater are cis-1,2-DCE and TCE.

The only potentially impacted area of ecological concern near the building is a patch of mowed turfgrass, approximately 100 feet long by 30 feet wide, that is surrounded on all sides by concrete. For these reasons, the potential for ecological risks on and near the site proper (surface soil and related terrestrial risks) is negligible.

Pre-FS field activities were conducted in August 2001 to fill data gaps, refine the nature and extent of soil and groundwater contamination, and refine subsurface characteristics. The soil sampling conducted during the pre-FS investigation resulted in further delineation of the extent of cis-1,2-DCE, TCE, and arsenic contamination. The pre-FS investigation did not identify any other COCs for soil based on protection of human health or protection of groundwater.

An In Situ Anaerobic Bioremediation Pilot Study was conducted in 2003. As part of the pilot study, soil samples were collected to improve the understanding of the extent of soil contamination. Two soil borings were installed and samples were collected at various depths. The results further refined the extent of soil contamination.

REMOVAL ACTION ALTERNATIVES

Two removal action alternatives were developed in this EE/CA. The first alternative is the no-action alternative. The second alternative addresses soil contaminated with 1,2-DCE, TCE, and arsenic at exposure concentrations greater than residential preliminary remediation goals (PRGs) based on protection of human health and protection of groundwater. The exposure concentrations are represented by the upper confidence limit (UCL) of the arithmetic mean. The objectives of the removal action included in the second alternative are to reduce potential risks to human receptors and to reduce migration of soil contaminants to groundwater. Limits were developed to ensure that contaminant concentrations in surface soil and subsurface soil would result in a UCL less than the PRGs following the removal action.

Alternative 1 is the no-action alternative included to serve as a baseline against which the other alternative is compared.

Alternative 2 includes excavation of soil with disposal in an off-site landfill. Areas of contaminated soil would be removed such that residual risks at the site would be acceptable for unrestricted residential use. Based on previous testing, the excavated soil would be classified as a hazardous waste. Excavated areas would be backfilled with clean soil and restored. No institutional controls with respect to soil contamination would be required for a residential use scenario.

RECOMMENDED ALTERNATIVE

The rationale for selection of the recommended alternative to address soil contamination is discussed below. Alternative 1 (No Action) would not provide adequate protection of human health or the environment and was therefore eliminated from consideration. The remaining alternative would provide adequate protection of human health and the environment.

Alternative 2 (Excavation and Off-Site Disposal) is the recommended alternative. Alternative 2 would protect human health by permanently removing contaminated soil. The potential for migration of soil contaminants to the environment would be eliminated. No long-term actions or institutional controls with respect to soil contamination would be required under a residential use scenario.

1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

The purpose of this Engineering Evaluation/Cost Estimate (EE/CA) is to develop and evaluate potential removal action alternatives to support a non-time-critical removal action for mitigating soil contamination at Site 57, Building 292 TCE Contamination, at Naval District Washington, Indian Head (NDW-IH) located in Indian Head, Maryland. The EE/CA was prepared for the Naval Facilities Engineering Command (NAVFAC) Washington by Tetra Tech NUS, Inc. (TtNUS) in response to Contract Task Order (CTO) 005 under Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N62472-03-D-0057. The EE/CA summarizes the information presented in the Site 57 Remedial Investigation (RI) Report (TtNUS, 2000) and draft Feasibility Study (FS) Report (TtNUS, 2002). The draft FS report evaluated remedial action alternatives for both soil and groundwater. However, additional data and treatability studies were needed to fully develop and evaluate remedial alternatives for groundwater. Therefore, the Navy decided to address the soil contamination while the groundwater studies were being conducted. In this EE/CA, remedial technologies were evaluated to form removal action alternatives to address soil contamination. The removal action alternatives were then evaluated for effectiveness, implementability, and cost to distinguish positive and negative aspects of each alternative.

1.2 REPORT ORGANIZATION

Section 1.0 presents the purpose of this report and background information for NDW-IH. Section 2.0 summarizes background information, physical characteristics, the nature and extent of soil contamination, and the human health and ecological risk assessments for Site 57. Section 3.0 presents the objectives and goals of the removal action, including preliminary remediation goals (PRGs). Section 4.0 presents the identification and analysis of the removal action alternatives. Section 5.0 presents a comparative analysis of the removal action alternatives.

1.3 NDW-IH BACKGROUND INFORMATION

1.3.1 Location and Description

The NDW-IH is located in northwestern Charles County, Maryland, approximately 25 miles southwest of Washington, D.C. The NDW-IH is a military facility consisting of the Main Area on the Cornwallis Neck Peninsula and the Annex on Stump Neck. The Main Area is bounded by the Potomac River to the northwest, west, and south, Mattawoman Creek to the south and east, and the Town of Indian Head to the northeast (Figure 1-1). Stump Neck Annex is located across Mattawoman Creek and is not contiguous with the Main Area.

1.3.2 Mission

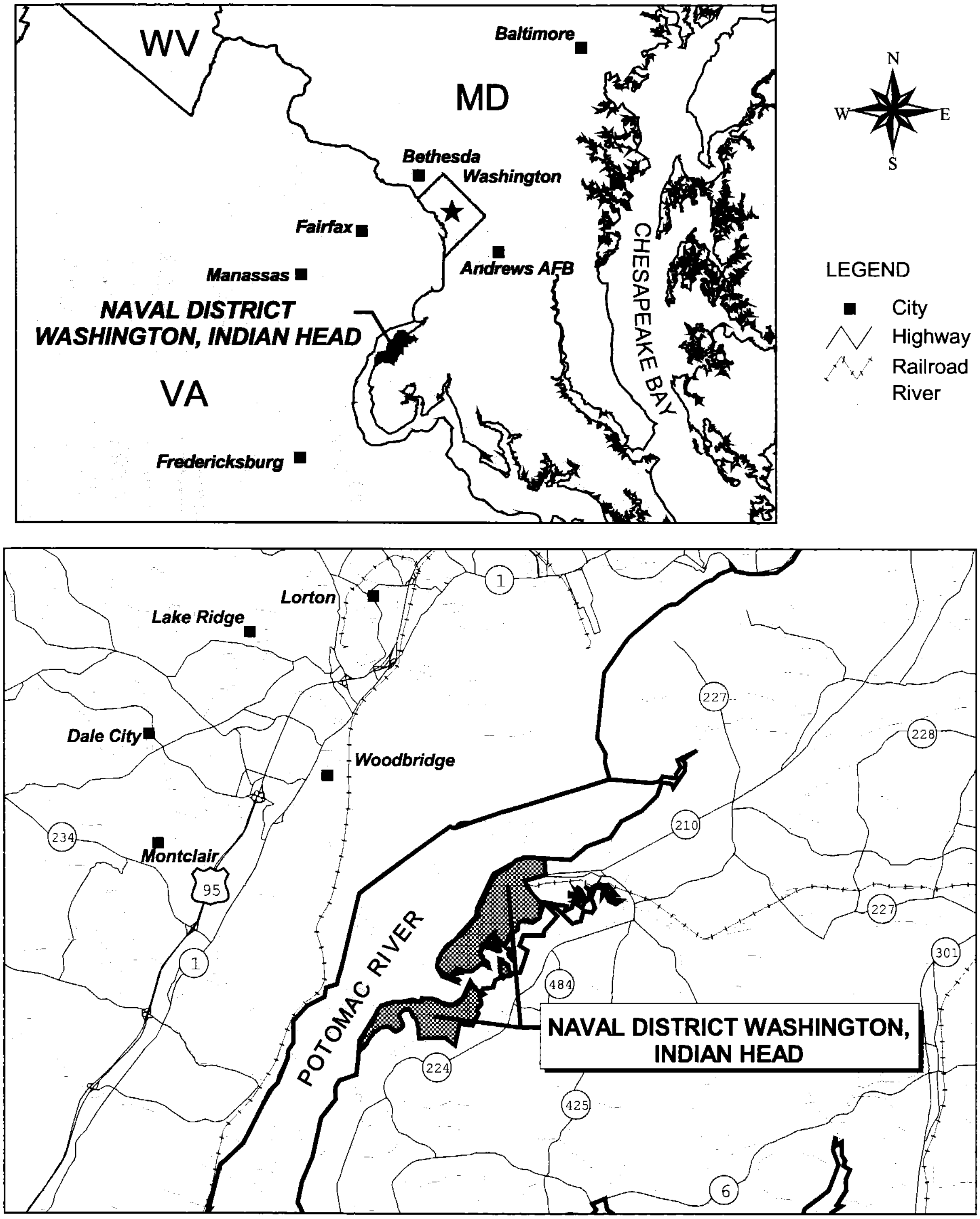
The primary mission of the Indian Head Division, Naval Surface Warfare Center (IHDIV-NSWC), the main tenant of NDW-IH, is as follows:

- Provide services in energetics for all warfare centers through engineering, fleet, and operational support, manufacturing technology, limited production, and industrial base support.

- Provide research, development, testing, and evaluation of energetic materials, ordnance devices, and components and other related ordnance engineering standards including chemicals, propellants, and their propulsion systems, explosives, pyrotechnics, warheads, and simulators.

- Provide support to all warfare centers, military departments, and the ordnance industry for special weapons, explosive safety, and ordnance environmental issues.

- Execute other responsibilities assigned by the Commander of the IHDIV-NSWC.



DRAWN BY K. PEILA DATE 3/17/05	Tetra Tech NUS, Inc.	CONTRACT NUMBER 2144	OWNER NO. 0005
CHECKED BY G. LATULIPPE DATE 3/17/05	FACILITY LOCATION MAP NAVAL DISTRICT WASHINGTON, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY GJL	DATE 3/17/05
COST/SCHEDULE-AREA		APPROVED BY —	DATE —
SCALE AS NOTED		DRAWING NO. FIGURE 1-1	REV 0

P:\GIS\NSWC_INDIAN_HEAD\SITE57_PILOTSTUDY_SITELOCATION.APR FACILITY LOCATION MAP 3/18/05 KMP

2.0 SITE DESCRIPTION AND BACKGROUND

2.1 SITE BACKGROUND AND HISTORY

Site 57, Building 292 TCE Contamination Area, encompasses the area located south of Building 292 on the Main Area of the NDW-IH (Figures 2-1 and 2-2). Previous operations from the mid-1960s until 1989 involved the use of trichloroethene (TCE) for vapor degreasing and general cleaning. During the 1970s and 1980s, spent TCE was transferred from a tank inside Building 292 into drums via a pipe that passed through the wall near the southern corner of the building. The drums were reportedly stored on a grass-covered area near manhole MH-1. It is believed that these operations have resulted in the contamination of soil and groundwater. The use of TCE at Building 292 stopped in 1989. The spent TCE was determined to be United States Environmental Protection Agency (EPA) hazardous waste number F002. Site 57 also includes Buildings 165 and 496, located approximately 150 feet southwest of Building 292, which were used to store ethyl ether.

2.2 PHYSICAL SETTING

2.2.1 <u>Topography</u>

The topography and surface features of the site area are shown on Figure 2-2. Building 292 is located in a valley approximately 1,300 feet north of Mattawoman Creek at an elevation of approximately 35 feet above mean sea level (msl). The valley trends approximately southeast toward Mattawoman Creek to approximately mean sea level. The valley slopes are much steeper east, north, and west of the site. A storm drain from Building 292 generally follows the valley and discharges to Mattawoman Creek. An intermittent stream also flows through the valley before discharging to Mattawoman Creek. Portions of an abandoned railroad track are located in the valley.

2.2.2 <u>Surface Water</u>

The two principal waterways near the Indian Head peninsula are the Potomac River and Mattawoman Creek. The Potomac River is a tidally influenced estuary and is slightly brackish. Mattawoman Creek is a tributary to the Potomac River and is tidally influenced. Tidal marshes exist along Mattawoman Creek.

Wastewater from NDW-IH is discharged directly to the Potomac River or Mattawoman Creek and from outfalls to tributaries of the Potomac River or Mattawoman Creek. The wastewater consists of industrial, sanitary, and storm effluents or combinations thereof (Hart, 1983).

2.2.3 Site Geology

A detailed characterization of site geology is presented in the RI Report for Site 57 (TtNUS, 2000). Generally, the subsurface materials within the stream valley consist of fill material and alluvium. The fill material consists primarily of reworked natural gravel, sand, silt, and clay. At some locations, the fill material contains minor amounts of asphalt, concrete, brick, terra cotta, and slag fragments. In areas of construction, the natural soil and alluvium are cut by, or supplemented with, the fill material.

The alluvium is interpreted as being derived from erosion of the adjacent upland areas. It generally consists of yellow-brown and gray, poorly sorted sand with minor amounts of gravel, silt, and clay overlying an olive-brown clay with well-sorted, very fine-grained sand and silt. The elevation of the contact between these two units ranges from approximately 10 feet below to 10 feet above msl. A lens of greenish-gray, very fine-grained, well-sorted sand and silt with a trace of clay is found within the yellow-brown and gray sand unit beneath the southern portion of Building 292. Its upper surface is at approximately 10 feet above msl; however, the thickness of this lens is unknown. Soil borings completed during the RI did not completely penetrate this lens.

2.2.4 Site Hydrogeology

The surficial aquifer in the yellow-brown sand unit and fill beneath the study area displays the characteristics of an unconfined system. The depth to the static water level in completed wells ranged from 3.6 to 11.5 feet below ground surface (bgs). The olive-brown silt and clay aquitard beneath the surficial aquifer is expected to hinder the downward movement of groundwater from the surficial aquifer to deeper aquifers. However, where the olive-brown silt and clay aquitard becomes sandier or thinner, it would be expected to provide less hindrance to downward groundwater flow.

The groundwater in the upper and lower portions of the surficial aquifer is flowing southeast toward the intermittent stream (unnamed stream) and Mattawoman Creek. There is a slight downward flow component in the northern portion of the study area and a very slight upward flow component in the southern portion of the study area. The upper surficial groundwater may be discharging to both the unnamed stream and Mattawoman Creek. The lower groundwater in the surficial aquifer is most likely discharging to Mattawoman Creek and, to a lesser degree, possibly to the unnamed stream. The surficial aquifer is recharged by infiltration of precipitation through the vadose zone and by groundwater flowing from the adjacent upland areas located to the north, east, and west.

The results of a tidal study showed that there is a tidal influence of approximately 0.5 foot on the groundwater at well S57TW003, which is located approximately 200 feet from Mattawoman Creek. The groundwater flow pattern at Site 57 is unlikely to be affected by tidal fluctuations because the site is located at a higher elevation and approximately 1,300 feet from the creek.

2.2.5 Sources of Contamination

The source of contamination was identified based on a review of the previous reports prepared for the site (see Section 2.3). The primary source of contamination for Site 57 was TCE used for vapor degreasing and general cleaning and stored in drums on a grass-covered area near manhole MH-1.

2.2.6 Contaminant Release Mechanisms

Past activities at Site 57 have resulted in contaminant releases to the surrounding environment. Spent TCE was transferred from a tank inside Building 292 into drums via a pipe that passed through the wall near the southern corner of the building. The drums were reportedly stored on a grass-covered area near manhole MH-1. Consequently, constituents have been released to the surrounding surface and subsurface soil by spilling, leaching, degradation, etc. of these materials.

2.3 PREVIOUS INVESTIGATIONS

This section provides a summary of the soil investigations conducted to date at Site 57. Details of soil sampling and sampling of other environmental media (groundwater, surface water, sediment, and seeps) can be found in the documents cited in the following sections. Analytical data from the soil investigations at Site 57 is provided in Appendix A.

Based on the results of these investigations and the risk assessments discussed in Section 2.4, the chemicals of concern (COCs) for soil are arsenic based on protection of human health and cis-1,2-dichloroethene (DCE) and TCE based on protection of groundwater. Therefore, the following discussion will focus on these primary contaminants.

2.3.1 Storm Sewer Sampling - 1994

In February 1994, storm sewer sampling was conducted at an industrial wastewater/stormwater outfall (designated IW-80) in response to an odor (Figure 2-2). Additional sampling was conducted in May and July 1994. TCE was detected at manhole MH-1 [62 micrograms per liter (µg/L)] immediately downgradient of Building 292 and more than 1,300 feet downstream of the building at IW-80 (47 to 60.2 µg/L), but was not detected upstream of Building 292. No other volatile organic priority pollutants were detected. Additional details on this sampling can be found in the RI Report (TtNUS, 2000).

2.3.2 Soil-Gas Survey - 1995

In September 1995, soil-gas, soil, groundwater, and storm water samples were collected to verify the presence of TCE.

Nine subsurface soil samples were collected from four locations. The soil samples were co-located with the soil-gas sampling points. Figure 2-3 shows the locations of the soil-gas survey soil sampling locations.

Concerning regulatory compliance, emphasis was placed on the EPA Soil Screening Level (SSL) for TCE concentrations in soil that could result in unacceptable contaminant migration to groundwater. The EPA SSL of 60 micrograms per kilogram (µg/kg) was exceeded by all the shallow soil samples collected, with a maximum concentration of 840,000 µg/kg detected in sample SO-07 at 2 to 4 feet bgs. The SSL was exceeded by a single deep soil sample (150 µg/kg in sample SO-10 from 10 to 12 feet bgs) which was collected at the same location exhibiting the second highest TCE concentration in shallow soil (9,300 µg/kg in sample SO-09 from 2 to 4 feet bgs).

Concentrations of TCE and also 1,2-DCE (Total) can be found on Figure 2-4. Refer to the 1996 Data Report for a more detailed discussion of the data (B&R Environmental, 1996).

2.3.3 Soil Vapor Extraction Pilot Study - 1997

A pilot-scale soil vapor extraction (SVE) investigation was conducted to evaluate the effectiveness and implementability of SVE for reducing TCE concentrations in the unsaturated soils (vadose zone).

The pilot-scale SVE system consisted of one extraction well screened at a depth of 6 to 10 feet bgs. Twelve drive point monitoring wells were installed to evaluate the effect of various air flow rates on TCE removal. The results of the study were presented in the Findings Report Pilot-Scale Soil Vapor Extraction Study (B&R Environmental, 1997).

Based on the vacuum and air flow monitoring results and analytical results for air samples collected from various locations in the pilot-scale SVE study, it was concluded that the subsurface conditions, as encountered during this pilot study, are not well suited to the application of SVE technology.

2.3.4 Remedial Investigation - 1998 to 1999

An RI was initiated in October 1998 to further delineate the extent of contamination. Investigative activities included aquifer testing and collection of 10 surface soil samples, 36 subsurface soil samples, 8 sediment samples, and 20 surface water samples for fixed-base laboratory analyses. Additional samples were collected for geotechnical analysis only. Figure 2-3 shows the locations of the remedial investigation soil sampling locations.

All surface and subsurface soil samples were submitted to the laboratory for Target Compound List (TCL) volatile organic compound (VOC) and ethyl ether analyses. The surface and subsurface soil samples collected from locations S57SB005, S57SB007, and S57SB008 and the surface soil samples collected from S57SB013 were submitted to the laboratory for additional analyses including TCL semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, TCL pesticides/polychlorinated biphenyls (PCBs), and explosives. The subsurface soil samples collected from S57SB002 were submitted to the laboratory for total organic carbon (TOC) in addition to TCL VOC and ethyl ether analyses.

Figures 2-5 and 2-6 show the concentrations of the primary contaminants in surface soil and subsurface soil sample within the area surrounding Building 292, the focus of this report. For surface soil, the maximum detected concentrations of TCE (93 μg/kg) and arsenic [103 milligrams per kilogram (mg/kg)] were in boring S57SB007. The only detection of cis-1,2-DCE (4 μg/kg) was also in boring S57SB007. For subsurface soil, the maximum detected concentrations of cis-1,2-DCE (77,000 μg/kg) and TCE (220,000 μg/kg) occurred at the 3 to 4 feet bgs interval at boring S57SB006. The maximum detected concentration of arsenic (50 mg/kg) occurred at the 4 to 6 feet bgs interval at boring S57SB005.

A more detailed discussion of this investigation can be found in the RI Report (TtNUS, 2000).

2.3.5 Pre-Feasibility Study Investigation - 2001

A field investigation was conducted in August 2001 to refine the nature and extent of soil and groundwater contamination and to refine subsurface characteristics. Field activities included the installation of soil borings, and temporary and permanent monitoring wells, soil sampling, groundwater sampling, cone penetrometer testing, and aquifer testing

Eighteen soil borings were installed to collect soil samples (Figure 2-3). Seven of the borings were converted into temporary monitoring wells and three of the borings were converted into permanent monitoring wells.

Soil borings S57SB016 through S57SB025 were installed in the source area near Building 292 to refine the extent of soil contaminated with arsenic and chlorinated solvents. This is the area where exposure to arsenic in soil could pose unacceptable risks to human health under residential and industrial exposure scenarios. This is also the area where previously detected concentrations of cis-1,2-DCE and TCE indicate a potential source of ongoing groundwater contamination. Surface and subsurface soil samples at various depths were collected from the borings. Most samples were analyzed for TCL VOCs and ethyl ether, and many samples were also analyzed for arsenic. Some of the subsurface soil samples were analyzed for engineering parameters including TOC, cation exchange capacity, pH, grain size, and bulk density. Arsenic was detected in surface and subsurface soil samples to a depth of 5 feet bgs at concentrations ranging from 2.3 to 79.9 mg/kg. Cis-1,2-DCE (12 to 690 µg/kg) and TCE (5.5 to 270 µg/kg) were detected in surface and subsurface soil samples. Most of the detections in subsurface soil samples were at a depth of 4 to 5 feet bgs. These VOCs were infrequently detected at deeper sampling intervals (8 to 10 feet and 14 to 16 feet bgs). The concentrations for arsenic, cis-1,2-DCE, and TCE in surface soil are shown on Figure 2-5. The concentrations for these primary contaminants in subsurface soil are shown on Figure 2-6.

Soil boring S57SB026 was installed to evaluate upgradient conditions. A subsurface soil sample was collected from this boring at a depth of 8 to 9 feet bgs and analyzed for TOC.

Soil borings S57SB027 through S57SB029 were installed upgradient, sidegradient, and downgradient of the source area to refine the extent of chlorinated solvent contamination. Surface and subsurface soil samples were collected and analyzed for TCL VOCs and ethyl ether. These borings were converted into temporary monitoring wells. TCL VOCs, including cis-1,2-DCE and TCE, were not detected in any surface or subsurface soil samples collected from these borings. Ethyl ether was detected in a few subsurface soil samples that corresponded to the locations where ethyl ether was detected in groundwater during the RI and pre-FS investigations.

Soil borings S57SB030 through S57SB032 were installed further downgradient of the source area to determine whether chlorinated solvent contamination was present. Subsurface soil samples were collected and analyzed for TCL VOCs and ethyl ether. Selected subsurface soil samples were also analyzed for engineering parameters. TCL VOCs and ethyl ether were not detected in any of the subsurface soil samples collected from these borings.

Soil boring S57SB033 was installed near potable water well PW-7 where TCE was detected during a previous sampling effort. A subsurface soil sample was analyzed for TCL VOCs and ethyl ether. This boring was converted into a permanent monitoring well. The only VOC detected in soil was methylene chloride.

The soil sampling conducted during the pre-FS investigation resulted in further delineation of the extent of cis-1-2-DCE, TCE, and arsenic contamination in soil.

2.3.6 In Situ Anaerobic Bioremediation Pilot Study - 2003

To improve the understanding of the extent of soil contamination and to add data to the Site 57 analytical database, soil samples were collected during the In Situ Anaerobic Bioremediation Pilot Study conducted in 2003 (TtNUS, 2004). Soil samples were collected at 4 to 5 feet bgs, 9 to 10 feet bgs, 13 to 14 feet bgs, 14 to 15 feet bgs, and 15 to 16 feet bgs from borings S57MW024-SB027 and S57MW025-SB028.

The maximum detected concentrations in S57MW024-SB027 were arsenic (32.8 mg/kg) at the 4 to 5 feet bgs interval and TCE (110,000 µg/kg) and cis-1,2-DCE (13,000 µg/kg) at the 9 to 10 feet bgs interval. The maximum detected concentrations in S57MW025-SB028 were arsenic (11.4 mg/kg) and TCE (63 µg/kg) at the 4 to 5 feet bgs interval and cis-1,2-DCE (5,800 µg/kg) at the 9 to 10 feet bgs interval. These results can be found on Figure 2-6.

2.4 STREAMLINED RISK EVALUATION

2.4.1 Human Health Risk Evaluation

A baseline human health risk assessment was developed for Site 57 in the RI Report that identified chemicals of potential concern (COPCs) and developed carcinogenic and non-carcinogenic risk estimates. Information on the procedures followed to develop the human health risk assessment is provided in the RI Report (TtNUS, 2000). The following discussion is a summary of the human health risk assessment for Site 57.

The human health risk assessment considered current and future full-time employees exposed to surface soil and future construction workers and hypothetical future residents exposed to surface and subsurface soil. Both reasonable maximum exposure (RME) and central tendency exposure (CTE) scenarios were evaluated. Exposures to current and future adolescent trespassers were not considered because the site is located in a secure area.

The baseline human health risk assessment identified potential unacceptable risks for future construction workers and hypothetical future residents exposed to soil. The human health risk assessment assumed residential use of the site in order to evaluate alternatives that would allow for unlimited use and unrestricted exposure at the site. Carcinogenic risks for future construction workers exposed to soil were within the EPA acceptable risk range (1E-04 to 1E-06). Carcinogenic risks for hypothetical future child and adult residents exceeded the acceptable risk range, and arsenic was the main contributor to the unacceptable risk. The hazard index (HI) exceeded 1.0 for construction worker and resident receptors for the RME scenario, and arsenic was the main contributor to the HI. Therefore, arsenic is a COC based on protection of human health.

To evaluate protection of groundwater, the human health risk assessment assumed the lower of the EPA generic SSLs and Maryland Department of the Environment (MDE) guidance values for protection of groundwater, both based on a dilution attenuation factor (DAF) of 10, which is consistent with MDE guidance. Table 2-1 presents a comparison of the maximum soil COPC concentrations, EPA SSLs, and MDE guidance values. Based on the comparisons in Table 2-1, the COCs for protection of groundwater include cis-1,2-DCE and TCE. Although the maximum concentrations of methylene chloride, benzo(a)anthracene, benzo(b)fluoranthene, and arsenic are higher than EPA SSLs based on a DAF of 10, these chemicals were not detected in groundwater. There is no EPA SSL or MDE guidance value for lead. Lead is not a COPC for groundwater.

No additional human health risk evaluation was conducted based on the 2002 data because the potential for unacceptable risks was already identified.

2.4.2 Ecological Risk Evaluation

The areas near Building 292 that could have received surface contamination are mainly covered with asphalt and gravel, providing no terrestrial habitat. Runoff from the potentially impacted areas near the building would flow southward into a ditch lined with a half-round metal pipe. The only potentially impacted area of ecological concern near the building is a patch of mowed turf grass, approximately 100 feet long by 30 feet wide, that is surrounded on all sides by concrete. For these reasons, the potential for ecological risks on and near the site proper (surface soil and related terrestrial risks) is negligible.

TABLE 2-1

SELECTION OF SOIL COCs FOR PROTECTION OF GROUNDWATER
SITE 57 – BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

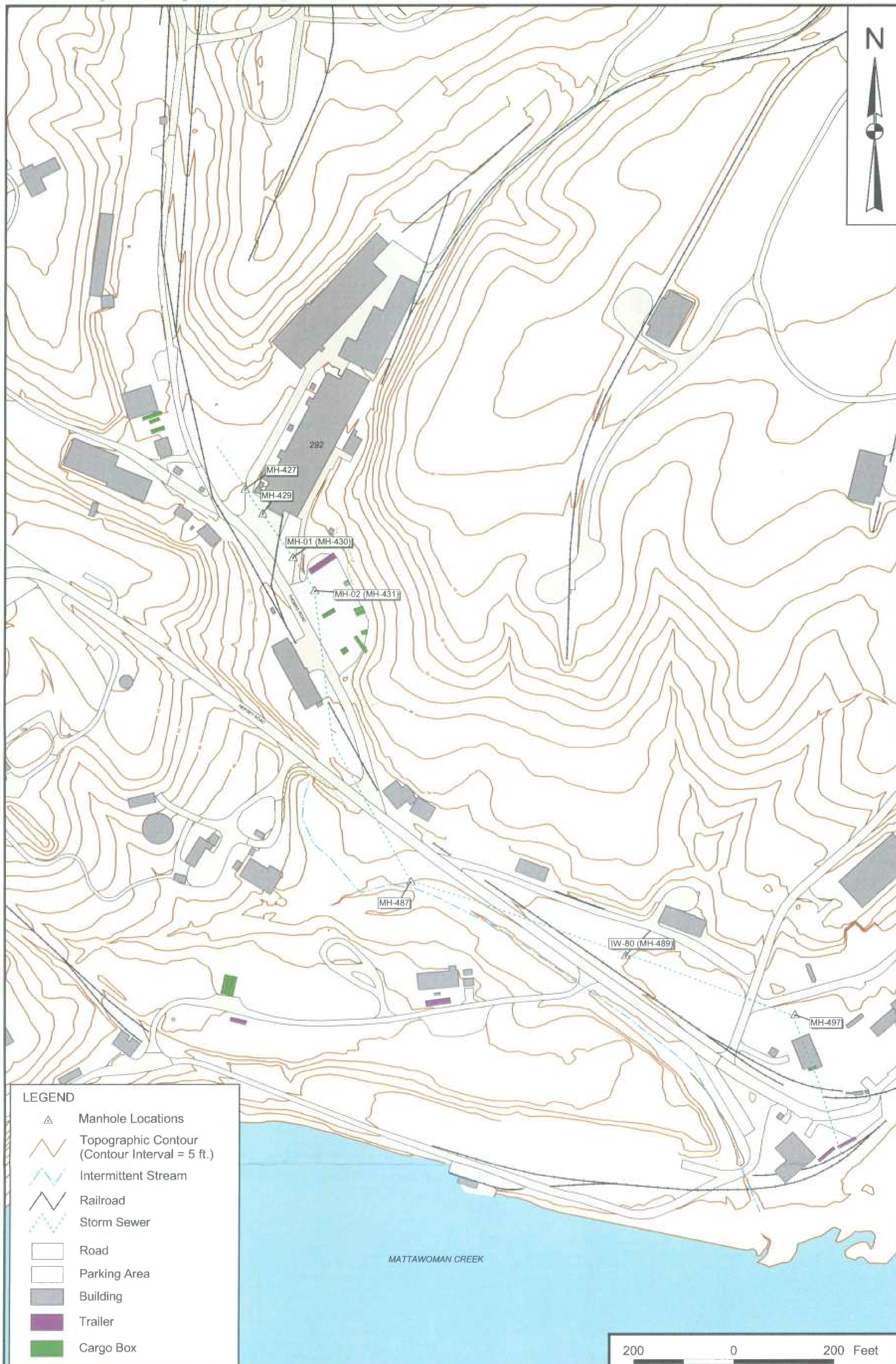
Soil COPC	Maximum Concentration	EPA SSL (DAF=10)	MDE Guidance (DAF=10)	Comments
Volatile Organics (µg/kg)				
cis-1,2-Dichloroethene	77,000	200	200	Exceeds both criteria
Methylene chloride	21,000	10	12	Exceeds both criteria but not detected in groundwater
Trichloroethene	220,000	30	28	Exceeds both criteria
Semivolatile Organics (µg/kg)				
Benzo(a)anthracene	2,300	1,000	40,000	Exceeds SSL but not detected in groundwater
Benzo(a)pyrene	1,700	4,000	4,100	Less than criteria
Benzo(b)fluoranthene	4,200	2,500	120,000	Exceeds SSL but not detected in groundwater
Dibenzo(a,h)anthracene	350	1,000	380,000	Less than criteria
Indeno(1,2,3-cd)pyrene	970	7,000	350,000	Less than criteria
Metals (mg/kg)				
Arsenic	103	15	NA	Exceeds SSL but not detected in groundwater
Lead	487	NA	NA	No criteria but not a COC for groundwater

Notes:
COC Chemical of concern.
COPC Chemical of potential concern.
DAF Dilution attenuation factor.
EPA United States Environmental Protection Agency.
MDE Maryland Department of the Environment.
NA Not available.
SSL Soil Screening Level.

P:\GIS\INDIANHEAD_NSWC\APR\COMMUNITYRELATIONSPLAN.APR SITE 57 WORK PLAN 3/18/05 KMP

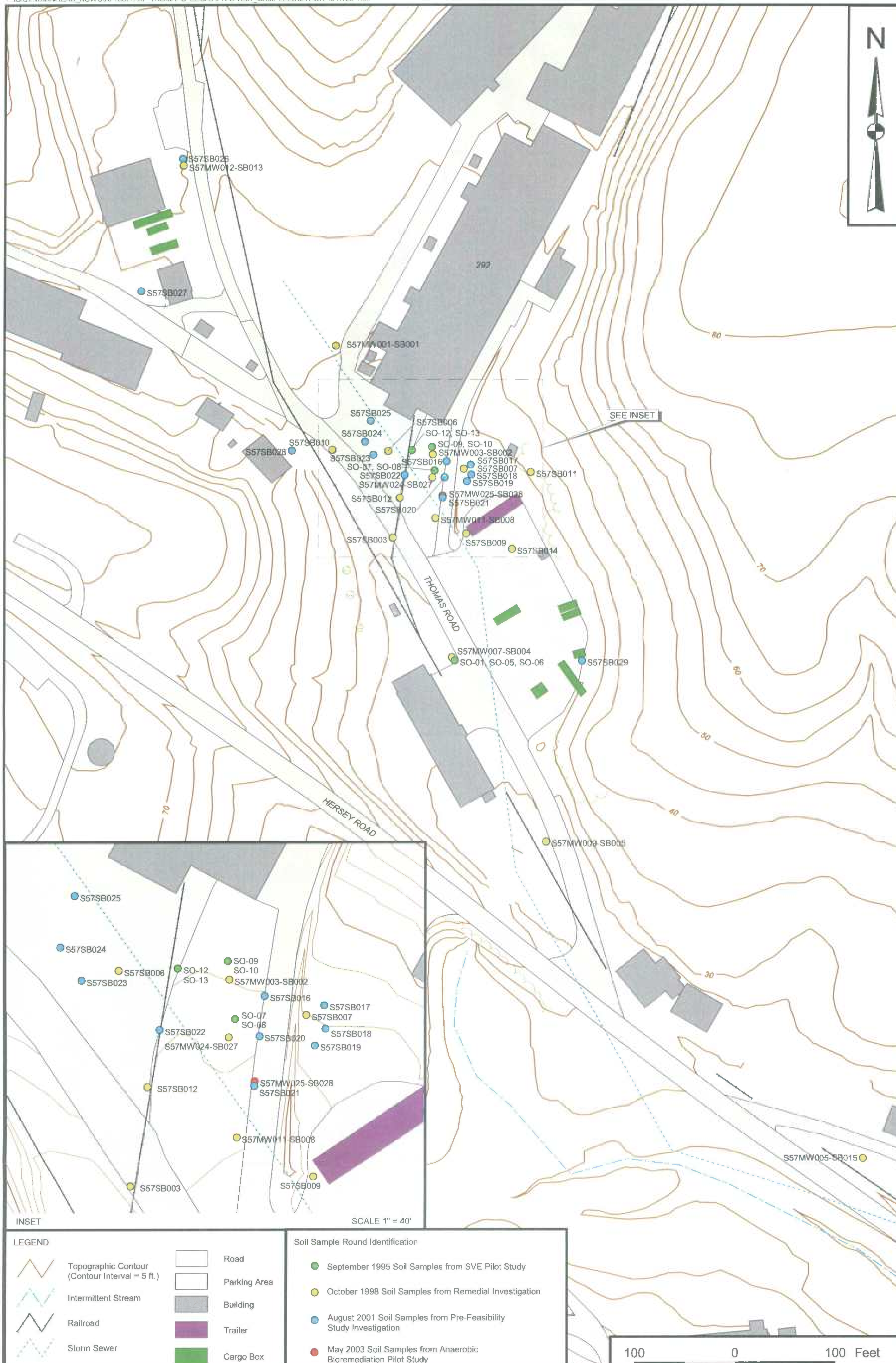
DRAWN BY K. PEILA	DATE 3/17/05	Tetra Tech NUS, Inc.	CONTRACT NUMBER 2144	OWNER NUMBER 0005
CHECKED BY GJL	DATE 3/17/05	SITE LOCATION MAP SITE 57 - BUILDING 292 TCE CONTAMINATION NAVAL DISTRICT WASHINGTON, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY GJL	DATE 3/17/05
COST/SCHEDULE-AREA			APPROVED BY	DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2-1	REV 0

P:\GIS\INDIANHEAD_NSWC\APR\7129_SITE57 APR\SITE 57_SITEMAP 3/17/05 KMP

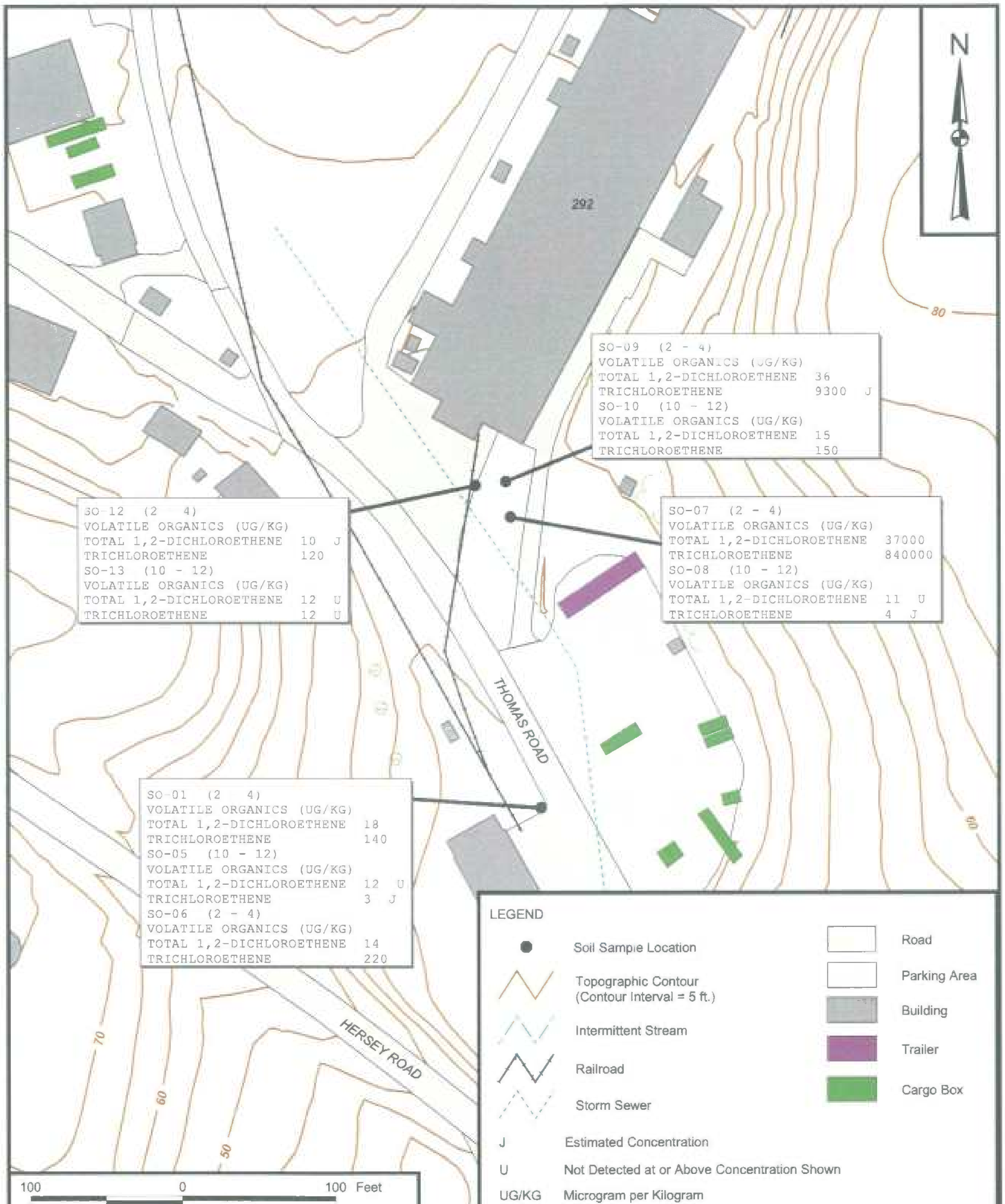


DRAWN BY K. PEILA	DATE 3/17/05	Tetra Tech NUS, Inc.	CONTRACT NUMBER 2144	OWNER NUMBER 0005
CHECKED BY G. LATULIPPE	DATE 3/17/05	SITE MAP SITE 57 - BUILDING 292 TCE CONTAMINATION NAVAL DISTRICT WASHINGTON, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY GJL	DATE 3/17/05
COST/SCHEDULE-AREA			APPROVED BY	DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 2-2	REV 0

P:\GIS\INDIANHEAD_NSWC\APR\SITE57_TAGMAPS_EECA.APR SITE57_SAMPLELOCATION 3/17/05 KMP



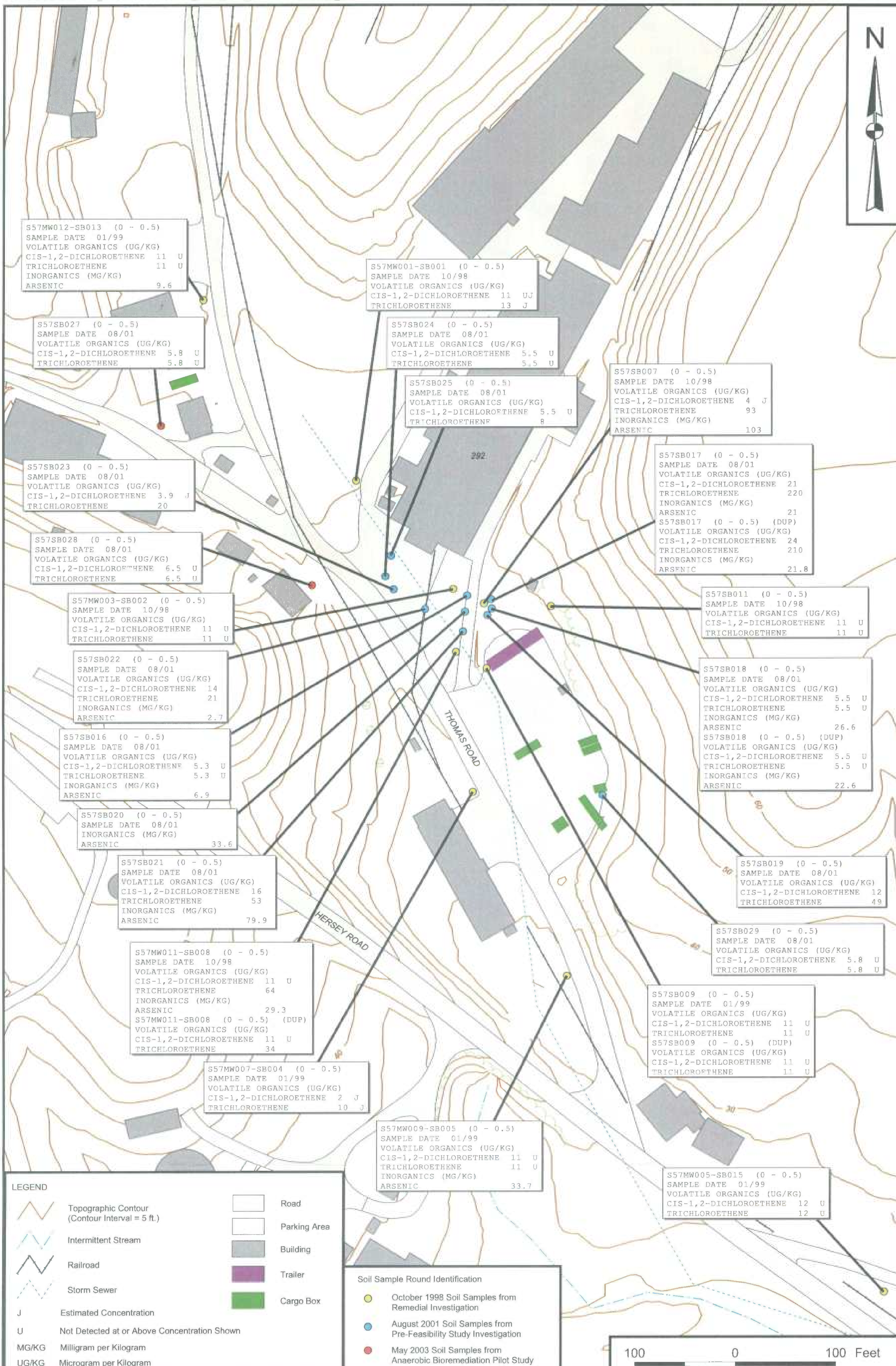
DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NUMBER
K. PEILA	3/17/05		2144	0005
CHECKED BY	DATE	SAMPLE LOCATION MAP	APPROVED BY	DATE
G. LATULIPPE	3/17/05	SITE 57 - BUILDING 292 TCE CONTAMINATION	GJL	3/17/05
COST/SCHEDULE-AREA		NAVAL DISTRICT WASHINGTON, INDIAN HEAD	APPROVED BY	DATE
SCALE		INDIAN HEAD, MARYLAND	DRAWING NO.	REV
AS NOTED			FIGURE 2-3	0



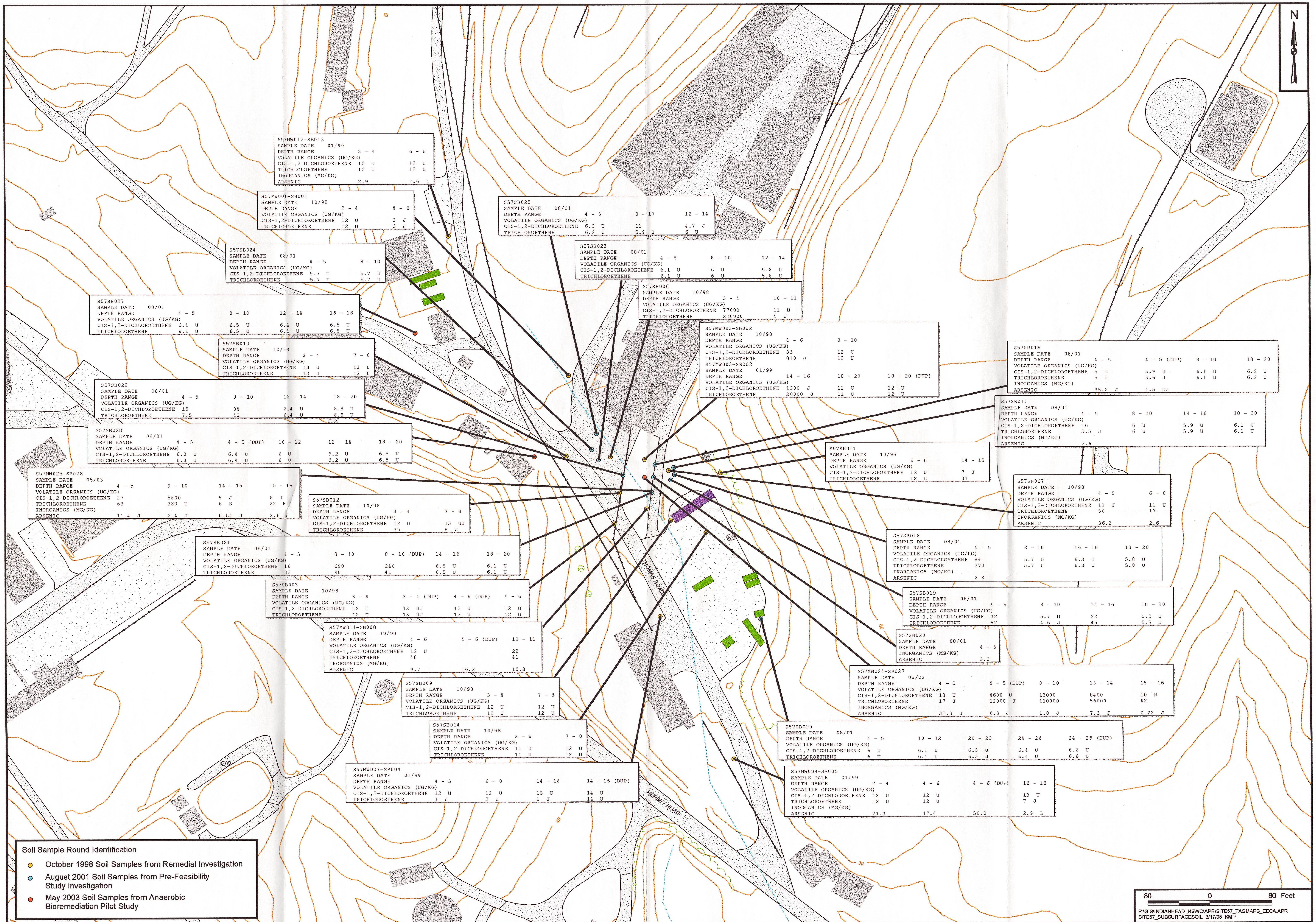
DRAWN BY K. PEILA	DATE 3/17/05	Tetra Tech NUS, Inc.	CONTRACT NUMBER 2144	OWNER NO. 0005
CHECKED BY G. LATULIPPE	DATE 3/17/05	SOIL - GAS SURVEY SOIL PRIMARY CONTAMINANT CONCENTRATIONS SITE 57 - BUILDING 292 TCE CONTAMINATION NAVAL DISTRICT WASHINGTON, INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY GJL	DATE 3/17/05
COST/SCHEDULE-AREA			APPROVED BY —	DATE —
SCALE AS NOTED			DRAWING NO. FIGURE 2-4	REV 0

P:\GIS\INDIANHEAD_NSWC\APR\SITE57_TAGMAPS_EECA.APR SITE57_SOILGAS 3/17/05 KMP

P:\GIS\INDIANHEAD_NSWC\APR\SITE57_TAGMAPS EECA.APR SITE57_SURFACESOIL 3/17/05 KMP



DRAWN BY K. PEILA	DATE 3/17/05	Tetra Tech NUS, Inc.		CONTRACT NUMBER 2144	OWNER NUMBER 0005
CHECKED BY G. LATULIPPE	DATE 3/17/05	SURFACE SOIL PRIMARY CONTAMINANT CONCENTRATIONS SITE 57 - BUILDING 292 TCE CONTAMINATION NAVAL DISTRICT WASHINGTON, INDIAN HEAD INDIAN HEAD, MARYLAND		APPROVED BY GJL	DATE 3/17/05
COST/SCHEDULE-AREA				APPROVED BY —	DATE —
SCALE AS NOTED				DRAWING NO. FIGURE 2-5	REV 0



LEGEND

Topographic Contour (Contour Interval = 5 ft.)	Railroad	Trailer	J Estimated Concentration
Intermittent Stream	Road	Cargo Box	U Not Detected at or Above Concentration Shown
Storm Sewer	Parking Area		MG/KG Milligram per Kilogram
	Building		UG/KG Microgram per Kilogram

DRAWN BY	DATE
K. PEILA	3/17/05
CHECKED BY	DATE
G. LATULIPPE	3/17/05
REVISED BY	DATE
COST/SCHEDULE-AREA	
SCALE	AS NOTED

Tetra Tech NUS, Inc.

SUBSURFACE SOIL
PRIMARY CONTAMINANT CONCENTRATIONS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NAVAL DISTRICT WASHINGTON, INDIAN HEAD
INDIAN HEAD, MARYLAND

CONTRACT NO.	OWNER NO.
2144	0005
APPROVED BY: GJL	DATE: 3/17/05
APPROVED BY:	DATE:
DRAWING NO.: FIGURE 2-6	REV.: 0

3.0 IDENTIFICATION OF REMOVAL ACTION OBJECTIVES AND TECHNOLOGY SCREENING

Removal action objectives (RAOs) are developed to provide guidelines for evaluating the removal action and to ensure that the action complies with regulatory requirements. This section provides an evaluation of applicable or relevant and appropriate requirements (ARARs), RAOs, and schedule, statutory limits, and discussions of applicable technologies for addressing soil contamination.

3.1 COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

ARARs are used to develop cleanup criteria for the RAOs and to identify removal action technologies. The term ARAR is defined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) as follows:

- Applicable requirements are generally defined as cleanup standards, standards of control, or other substantive environmental protection requirements promulgated under federal or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, or location. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be considered as applicable requirements.

- Relevant and appropriate requirements are defined as cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state environmental or facility siting laws that are not directly "applicable" to a hazardous substance, pollutant, contaminant, remedial action, or location, but that address situations sufficiently relevant to those encountered at the site that their use is appropriate. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be considered as relevant and appropriate requirements.

Based on the manner in which they are applied during a removal action, ARARs are classified into three categories as follows:

- <u>Chemical-Specific</u>. Chemical-specific ARARs were developed to provide health- or risk-based concentration limits. These limits are specific for an individual chemical or group of chemicals. Often, these ARARs are used to determine the extent of site remediation. Chemical-specific ARARs may be concentration-based cleanup goals or may provide the basis for calculating such levels. In cases where no chemical-specific ARAR exists, chemical advisories may be used to develop RAOs (see Table 3-1).

- Location-Specific. Location-specific ARARs are considered in view of natural or man-made site features. These ARARs are intended to limit activities within designated areas (see Table 3-2).

- Action-Specific. Action-specific ARARs pertain to the implementation of a given remedy. These ARARs control or restrict hazardous substance- or pollutant-related activities. These controls are considered when specific removal activities are planned for a site (see Table 3-3).

In addition to ARARs, other regulations and guidance may be classified as guidance To Be Considered (TBC). TBCs are non-promulgated, non-enforceable guidelines or criteria that may be useful for developing removal actions or "are" or "may be" necessary for determining what is protective of human health and/or the environment. TBCs are also identified in this section to aid in the evaluation of the removal actions.

Section 121(d)(4) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) identifies circumstances under which ARARs may be waived, including the instance where the selected removal action is an interim remedy and the final remedial action will attain the ARAR upon its completion. Because the selected removal actions being addressed under this EE/CA are such interim remedies, the actions do not necessarily need to comply with all identified ARARs. However, ARARs will be attained to the extent practicable.

3.2 REMOVAL ACTION OBJECTIVES AND PRELIMINARY REMEDIATION GOALS

3.2.1 Removal Action Objectives

The RAOs for this non-time critical removal action are:

- Prevent exposure to soil contaminated at exposure concentrations greater than PRGs.
- Prevent or minimize further migration of contaminants from soil to groundwater.

Actions should be taken to minimize erosion of soil and subsequent off-site migration of contaminants. Actions should also be taken to minimize air emissions of fugitive dust during construction.

3.2.2 Preliminary Remediation Goals

PRGs were developed for arsenic based on protection of human health and for TCE and cis-1,2-DCE based on protection of groundwater (refer to Section 2.4.1).

Based on a hazard index of 1.0, the PRG for arsenic for the future construction worker is 65 mg/kg. The PRG for arsenic for the hypothetical future child resident is 22.5 mg/kg. The basis for the residential PRG is the child receptor because the child is more sensitive than the adult. Calculations are provided in Appendix B.

Soil PRGs for protection of groundwater are based on the lower of the EPA generic SSLs and MDE guidance values for protection of groundwater, both based on a DAF of 10, which is consistent with MDE guidance. The PRGs for cis-1,2-DCE (200 μg/kg) and TCE (28 μg/kg) are based on the MDE guidance values. Table 2-1 presents a comparison of the maximum soil concentrations, EPA SSLs, and MDE guidance values.

A statistically-based approach was used to determine the concentrations above which the soil must be removed to achieve exposure concentrations less than or equal to the PRG for a defined exposure unit, the area within which a receptor is assumed to be exposed to contaminants. The concentration above which the soil must be removed is referred to as the "pickup level." The exposure concentration for each COC is represented by the upper confidence limit of the arithmetic mean (UCL) of the concentrations for each respective COC. For this EE/CA, the Site 57 exposure unit is generally defined by the array of sample locations illustrated on Figure 2-3.

An iterative process was used to determine the "pickup levels." The process involved performing a simulated removal of the soil with the highest contaminant concentrations by replacing those concentrations in the data set with a "clean fill" concentration, then recalculating the UCL for each COC. For the purposes of this evaluation, the replacement values (i.e., the "clean fill" concentrations) for TCE and cis-1,2-DCE is 6.5 μg/kg, and for arsenic it is 5.41 mg/kg. The concentration of 6.5 μg/kg for TCE and cis-1,2-DCE corresponds to one-half the detection limit typically seen in the data set for these constituents. It is assumed that no TCE or cis-1,2-DCE would be detected in the clean fill. The concentration of 5.41 mg/kg represents an estimate of the background arsenic concentration at the site based on the original background data set.

It was qualitatively established that TCE is the primary constituent that would drive the remediation and that arsenic would be the secondary constituent. Therefore, the samples were first sorted according to the TCE concentrations, from highest to lowest. The maximum TCE concentration was replaced with 6.5 μg/kg, and the UCL was recalculated. If the UCL was not less than the PRG, then the next highest TCE concentration was removed and replaced with 6.5 μg/kg. This process continued until the UCL for TCE was less than the desired PRG for the target receptor. At that point the "pickup level" for that analyte was defined as the maximum detected concentration for that analyte remaining in the data set following the simulated remediation.

Remediating Site 57 to achieve a target exposure concentration for TCE less than its PRG will result in a concomitant reduction of concentrations of co-located constituents. To simulate that effect, as the process described above for TCE progressed, whenever a TCE concentration for a sample was replaced with the concentration for clean fill, the cis-1,2-DCE and arsenic concentrations in that sample were also replaced with the clean fill concentration. Upon completion of the simulated TCE remediation, the UCL for cis-1,2-DCE and arsenic were calculated and compared to the PRG for that analyte to ensure that residual organic contaminant concentrations were within the desired range based on the PRGs.

After the pick-up level was set for organic contaminants, it was determined that additional removal was still needed to reduce the exposure concentration for arsenic. The samples were then sorted according to arsenic concentrations, from highest to lowest. The arsenic concentrations were replaced with 5.41 mg/kg, and the UCL was recalculated. If the arsenic UCL was not less than the PRG, then the next highest arsenic concentration was replaced with 5.41 mg/kg. This process continued until the UCL for arsenic was less than the desired arsenic PRG. At that point, the "pickup level" was defined as the maximum detected concentration for that analyte remaining in the data set following the simulated remediation.

Applying the process described above to the data collected during previous investigations, it was determined that removing soil with TCE concentrations greater than or equal to 120 µg/kg would be protective of groundwater; and removing soil with arsenic concentrations greater than or equal to 36.2 mg/kg would be protective of residential receptors. Appendix C summarized the statistical approach taken to define the limits of removal.

The areas where concentrations are higher than the "pickup levels" and require removal are presented on Figure 3-1. The large area near Building 292 is approximately 1,695 square feet. The small area near Building 292 is approximately 225 square feet. The area south of Building 292 surrounding locations SO-01 and SO-06 is approximately 125 square feet. The water table, which past investigations indicate to be approximately 8 feet bgs, is set as the vertical limit of the removal action. Therefore, the volume of contaminated soil near Building 292 and south of Building 292 is estimated to be 606 cubic yards.

3.3 REMOVAL ACTION SCHEDULE

The removal should be initiated within 1 to 2 years after selection of the alternative.

3.4 STATUTORY LIMITS

The statutory limits for cost and schedule for fund-financed removal actions are presented in Section 104(c)(1) of CERCLA. These limits are not applicable because the actions at NDW-IH are financed by the Department of Defense, not the federal Superfund.

3.5 TECHNOLOGY SCREENING

This section screens technologies for soil based on the criteria of effectiveness, implementability, and cost, as detailed below. Screening evaluations at this stage generally focus on effectiveness and implementability, with less emphasis on cost.

Effectiveness

Effectiveness is evaluated based on the following criteria:

- Ability of the technology to address the estimated areas or volumes of the contaminated medium
- Ability of the technology to meet the RAOs
- Technical reliability (innovative versus well proven) with respect to contaminants and site conditions
- Potential impacts to human health and the environment during implementation

Implementability

Implementability is evaluated based on the following criteria:

- Overall technical feasibility at the site
- Availability of vendors, mobile units, storage, disposal services, etc.
- Administrative feasibility

Cost

Cost is evaluated based on the following criteria:

- Capital costs
- Operation and maintenance (O&M) costs

3.5.1 No Action

Under no action, neither a removal action nor periodic maintenance is undertaken at the site.

Effectiveness

No action would not protect human health or the environment because it would allow contaminated soil to remain at the site. Human receptors could contact contaminated soil, and the soil would be a continuing source of groundwater contamination.

No action is not reliable because it would not remove the contamination from the site.

Implementability

No action is technically and administratively feasible at the site. The availability of vendors, mobile units, storage, disposal services, etc. is not applicable.

Cost

There are no costs for this technology.

Conclusion

No action is implementable, but it is not effective. However, no action will be retained as a baseline for comparison to other options.

3.5.2 Containment

The technologies being considered for containment include capping and vertical barriers.

Caps and covers can minimize the potential for human contact with surface and subsurface soil. They can also reduce the migration of contaminants caused by surface water infiltration, runoff, and wind erosion. Soil covers consist of a layer of soil or clay placed or compacted over areas of soil contamination. Asphalt caps consist of a layer of asphalt placed over areas of soil contamination where vehicular access must be maintained. Multimedia caps (engineered caps) consist of layers of soil, synthetic materials, and/or composite materials placed or compacted over areas of soil contamination.

Vertical barriers consist of slurry walls, grout curtains, sheet piling, etc. that are used to minimize the horizontal migration of contaminants, especially within the saturated zone. The barriers are placed around or downgradient of areas of contamination and extend from the ground surface to at least the bottom of the contamination and very commonly into a confining layer. The selection of the type of barrier depends on site-specific conditions, including compatibility of the barrier with subsurface conditions and contaminants.

Effectiveness

Soil covers, asphalt caps, and multimedia caps can be effective in minimizing human exposure to contaminated surface and subsurface soil. The use of low-permeability materials such as compacted clay, synthetic membranes, or composite materials would be effective in minimizing rainfall infiltration into the contaminated material beneath the cover.

The use of vertical barriers may be considered if horizontal migration of saturated subsurface soil (and groundwater) contaminants is a potential concern. They are less effective for contamination above the water table. Slurry walls are more commonly used than ground curtains and sheet piling and may be more effective in coarser soils. The very nature of vertical barriers (i.e., installed below-grade) makes it very difficult to effectively monitor their continuing effectiveness since leaks are very difficult to identify, locate, and repair.

Implementability

The main concern with the implementation of caps is the maintenance of the integrity of the cap from natural and human interferences. The area around Site 57 is an active facility with a roadway that is frequently used. The activities conducted there (primarily vehicular traffic) could damage a soil cover or cap unless contaminated areas were covered with pavement or concrete. In addition, the cap system would need to retain the existing topography and grades near Building 292. Cap installation would require the disposal of soil excavated to a depth of approximately 2.5 feet under the area to be capped in order to accommodate the various layers necessary for establishing an impermeable cap using a synthetic membrane.

The use of vertical barriers must consider the control of water-table levels within the contained area and could cause an increase in upgradient groundwater elevations. Maintenance of the integrity of vertical barriers is difficult over the long term. The presence of below-grade utilities on the site complicates the installation of vertical barrier, and requires penetrations through the barrier to maintain utility service. Future utility maintenance would be more costly when the vertical barrier is affected by the need to perform maintenance on the existing utilities or the need to install new or replacement utilities.

Cost

Costs for soil covers and asphalt caps are low to moderate. Costs for engineered caps are moderate to high, depending on the materials and labor involved in placement. Costs of vertical barriers are moderate for slurry walls and sheet piling but high for grout curtains. The costs for vertical barriers tend to increase where below-grade utilities must be accommodated.

Conclusions

An asphalt cap underlain by a synthetic membrane and vertical barriers to reduce horizontal migration of soil contaminants are eliminated from further consideration. Although containment of the site is an effective means of minimizing exposure to human receptors and restricting infiltration, it does not allow unrestricted use of the land following implementation.

3.5.3 Excavation

Excavation can be performed by various types of equipment such as front-end loaders, backhoes, grade-alls, etc. The type of equipment selected must take into consideration several factors such as the type of material to be removed, the load-bearing capacity of the ground surrounding the removal area, the depth and aerial extent of removal, the required rate of removal, and the elevation of the groundwater table. Excavation is the technology of choice for the removal of well-consolidated material such as soil to a depth of up to 30 feet.

The logistics of excavation must take into account the available space for operating the equipment, loading and unloading of the excavated material, location of the site, etc. After excavation is completed, the location is filled and graded with clean fill material or treated soils.

Effectiveness

Excavation is a well-proven and effective method of removing contaminated material from a site. Sampling is typically required to verify the effectiveness of the removal action. Excavation would not be expected to have short-term impacts on the community or environment. Any dust that would be generated could be adequately controlled. Erosion and sedimentation controls would be needed to control off-site migration of soil contaminants. Excavation would expose workers to contaminants during the implementation phase, although exposure would be minimized through the use of proper health and safety procedures. Excavation would provide protection of human health and the environment at the site for the long term because contaminated material would be removed from the site. The excavated material would require further treatment and/or disposal.

Implementability

Excavation of contaminated soil at Site 57 would be implementable; however, the presence of underground utilities needs to be considered so they are not damaged. Below-grade utilities would need to be accommodated for the duration of the remedial activity. No special post-remediation utility considerations apply into the future. Excavation equipment is readily available from multiple vendors. This technology is well proven and established in the construction and remediation industry. During excavation, site-specific health and safety procedures and Occupational Safety and Health Administration (OSHA) regulations would have to be complied with to ensure that the exposure of workers to COCs is minimized.

Cost

The cost of excavation at Site 57 would be low to moderate.

Conclusion

Excavation is retained in combination with other process options for the development of removal action alternatives. It permanently removes the contamination from the site. Its cost effectiveness improves as soil volumes decrease; and future utility maintenance, replacement, and installation are not a factor.

3.5.4 In-Situ Treatment

The process options considered under in-situ treatment are soil vapor extraction (SVE) and multi-phase extraction (MPE).

SVE is a process that physically removes contaminants by inducing air flow by applying a vacuum to extraction wells screened in the saturated zone. VOCs tend to partition into air as the air moves through the soil to the extraction wells. The gas leaving the soil may be treated to recover or destroy the contaminants, depending on air discharge regulations. SVE is one of the presumptive remedies identified by EPA where VOCs are present in soil.

MPE is an enhancement of the SVE option under the presumptive remedy for sites with VOCs in soil. MPE simultaneously extracts both groundwater and soil vapor. The water table is lowered so that the SVE process can be applied to the newly exposed soil. This allows the VOCs sorbed on the previously saturated soil to be stripped by the induced airflow and extracted. In addition, soluble VOCs present in the extracted groundwater are also removed.

Effectiveness

SVE is a well-demonstrated technique for removing VOCs from the vadose zone (i.e., above the water table) on sites with suitable subsurface soil permeability. It may not be as effective at sites with low-permeability soils. It is not effective for most polynuclear aromatic hydrocarbons (PAHs) or metals. A draft EE/CA was prepared in 1998 to determine the most effective approach for addressing TCE contamination in soil at Site 57 (B&R Environmental, 1998). The EE/CA recommended SVE. Subsequently, a pilot study was conducted at Site 57 to verify the suitability of the site for application of the SVE process. The pilot study demonstrated that the site is not suitable for SVE (B&R Environmental, 1997).

MPE has proven to be more effective at removing subsurface VOCs at low- to moderate-permeability sites than conventional pump-and-treat and SVE systems alone. It can remove contaminants from above and below the water table. It is not effective for metals.

Implementability

SVE is a readily available conventional process that has been used at numerous Superfund sites. Air pollution controls may be required. There may be operational problems if the air extraction wells are screened near the water table. The depth to the water table near Building 292 is approximately 8 feet.

MPE is an innovative process that has been applied at dozens of sites. Air pollution controls may be needed. The aquifer must be able to be dewatered for MPE to be successful. Although some transfer of VOCs from groundwater to the vapor phase is expected, extracted groundwater may need to be further treated prior to discharge. Air pollution controls may be required.

Neither technology addresses metal contamination.

Treatability studies would be required for both of these treatment processes.

Cost

The cost of SVE is low. Costs for MPE would be higher because additional equipment would be needed, groundwater dewatering would be necessary (requiring the need for a sheet piling wall, a slurry wall, or well points), and the extracted groundwater would require treatment.

Conclusion

SVE for removal of VOCs from vadose zone soil is eliminated because of effectiveness concerns identified during the previous pilot study. MPE is also eliminated because of effectiveness concerns for the SVE part of the MPE process. Additionally, MPE is more equipment and process (i.e., dewatering) intensive than SVE. Neither process is suitable for treating metals contamination.

3.5.5 Ex-Situ Treatment

The process option considered under ex-situ treatment is low-temperature thermal desorption.

Low-temperature thermal desorption is a physical separation process that treats wastes at 200 to 600 degrees Fahrenheit (°F) to volatilize water and organic contaminants. A carrier gas or vacuum system transports volatilized water and organic contaminants to a gas treatment system. The bed temperatures and residence times will volatilize selected contaminants but typically will not oxidize or destroy them. Two common thermal desorption designs are the rotary dryer and thermal screw. Rotary dryers are horizontal cylinders that can be indirect or direct fired. The dryer is normally inclined and rotated. For thermal screw units, screw conveyors or hollow augers are used to transport the medium through an enclosed trough. Hot oil or steam circulates through the auger to indirectly heat the medium.

Effectiveness

Thermal desorption should be effective at volatilizing the VOCs of concern. It is not effective for metals. Contaminant destruction efficiencies in the afterburners of these units are greater than 95 percent. The same equipment could probably meet stricter requirements with minor modifications, if necessary. Decontaminated soil could be used as backfill if PRGs are met or it can be transported to an off-site landfill.

Implementability

Low-temperature thermal desorption is an innovative process that is being used more often. Full-scale and mobile units are available. All thermal desorption systems require treatment of the off-gas to remove particulates and contaminants. Dewatering may be necessary to achieve acceptable soil moisture content. Heavy metals in the feed may produce a solid residue that requires further treatment or disposal. On-site thermal desorption would be preferred over off-site treatment because the soil could be used to backfill excavated areas, assuming that soil PRGs can be attained.

Costs

The relative cost of low-temperature thermal desorption is low to moderate. However, mobilization costs would be relatively high for smaller volumes of soil.

Conclusion

Low-temperature thermal desorption would be effective and implementable for removing VOCs; however, it is not effective for metals. The relatively small volume of contaminated soil would not justify mobilization of on-site treatment equipment. In addition, the treated soil would contain arsenic at concentrations greater than PRGs, which could preclude the soil's use as backfill in the excavation(s). Therefore, this process is eliminated from consideration.

3.5.6 Off-Site Disposal

Disposal in an off-site hazardous waste or nonhazardous waste landfill is an effective technology and can be easily implemented if volumes are not excessive. This technology requires excavation, loading, and hauling of contaminated soil to an approved facility for final disposal. All contaminated material can be disposed at a properly permitted facility.

Effectiveness

Off-site disposal is a very effective long-term disposal action for contaminated soil. Off-site disposal would provide long-term protection of human health and the environment. After the contamination is removed, there would not be unacceptable residual risks. Off-site transport of a large volume of contaminated material could impact the community (e.g., increased traffic, potential for spills). Off-site disposal is a very reliable removal action because the contaminated materials are removed from the facility and O&M activities are not required.

Implementability

Off-site disposal is implementable because facilities with adequate capacity are available.

Cost

The capital cost associated with off-site disposal is medium to high depending on the waste classification. There are no O&M costs associated with this technology.

Conclusion

Off-site disposal is readily implemented, and requires no post-remedial monitoring or maintenance. For small volumes of soil, it is cost competitive. It is retained in combination with other process options for the development of removal action alternatives.

3.5.7 Institutional Controls and Monitoring

Institutional controls consist of administrative (non-engineering) controls and procedures to limit access to and activities at a site. A monitoring program, subject to regulatory approval, would be developed that would include routine sampling and analysis of environmental media and additional sampling to further evaluate risk and to monitor potential migration of soil contaminants.

Effectiveness

Prohibiting residential development and the development of facilities in which children would be exposed would prevent the occurrence of unacceptable risks from direct exposure by human receptors. The control of work permits would limit exposure to on-site workers. However, the effectiveness of institutional controls is dependent on the long-term enforcement of a land use control plan. Institutional controls would not be effective in reducing the migration of soil contaminants to groundwater

Implementability

Institutional controls would be readily implemented. A land use control plan can be readily developed and enforced by existing departments at NDW-IH. Monitoring programs are readily developed and implemented.

Cost

The capital cost for institutional controls and monitoring would be low. Operating costs will be low to moderate, but the need for enforcement of the land use controls and monitoring could be indefinite.

Conclusion

Institutional controls and monitoring are eliminated from further consideration because institutional controls and monitoring do not allow unrestricted use of the land following implementation and would not effectively reduce contaminant migration from soil to groundwater.

3.6 SUMMARY OF APPLICABLE TECHNOLOGIES

Table 3-4 summarizes the identified technologies and whether they were retained or not retained for consideration.

TABLE 3-1

CHEMICAL-SPECIFIC ARARs AND TBCs
SITE 57 – BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Act/Authority	Criteria/Issues	Citation	Brief Description	Status	Consideration in the EE/CA
Federal					
Risk Assessment Guidance	EPA Region 3 RBCs	NA	Can be used to estimate risks and to develop risk-based cleanup goals.	To be considered	Considered for determining areas of the site that pose an unacceptable risk and for developing soil cleanup goals.
	Reference Doses and Cancer Slope Factors	NA	Used to estimate risks and can be used to develop risk-based clean-up goals.	To be considered	Considered for determining areas of a site that pose an unacceptable risk.
	EPA Generic SSLs	NA	Can be used to estimate risks and to develop risk-based cleanup goals.	To be considered	Considered for determining areas of a site where soil may be a continuing source of groundwater contamination.
State					
MDE Guidance	Clean-up Standards for Soil and Groundwater	Interim Final Guidance	Guidance for remedial actions based on land use and projected use of groundwater for potable use.	To be considered	Considered for determining remediation goals for soil and groundwater.

Notes:

ARARs Applicable or relevant and appropriate requirements.
EE/CA Engineering Evaluation/Cost Analysis.
EPA United States Environmental Protection Agency.
MDE Maryland Department of the Environment.
NA Not applicable.
RBC Risk-Based Concentration.
SSL Soil Screening Level.
TBCs To Be Considered Criteria.

TABLE 3-2

LOCATION-SPECIFIC ARARs AND TBCs
SITE 57 – BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Act/Authority	Criteria/Issues	Citation	Brief Description	Status	Consideration in the EE/CA
Federal					
Endangered Species Act	Protection of Endangered Species	16 USC 1531 et seq. and 50 CFR 402	This act and associated regulations requires federal agencies to act to avoid jeopardizing the continued existence of federally listed endangered or threatened species.	Not applicable	There are no endangered or threatened species or critical habitats at Site 57.
Fish and Wildlife Coordination Act	Impacts on Fish and Wildlife	16 USC 661	Requires federal agencies to consult appropriate state agencies before structural modification of any body of water, including wetlands. Requires action to be taken to protect fish and wildlife from projects affecting the water body and provides for consideration of impacts on wetlands and protected habitats.	Not applicable	Remedial actions are not expected to impact surface water or wetlands.
Protection of Wetlands	Activities in Wetlands	E.O. 11990 and 40 CFR 6 Appendix A	If no practicable alternative exists to a remedial activity that may adversely affect a wetland, impacts from implementing the chosen alternative must be mitigated.	Not applicable	There are no wetlands at, or that could be affected by, remedial activities at Site 57.

TABLE 3-2

LOCATION-SPECIFIC ARARs AND TBCs
SITE 57 – BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Act/Authority	Criteria/Issues	Citation	Brief Description	Status	Consideration in the EE/CA
Floodplain Management	Activities in Floodplains	E.O. 11988 and 40 CFR 6 Appendix A	If no practicable alternative exists to performing cleanup in a floodplain, potential harm must be mitigated and actions taken to preserve the beneficial values of the floodplain.	Not applicable	Site 57 is not located within a floodplain.
Archeological and Historical Preservation Act of 1974	Historic Areas	16 USC 470 et seq. and 36 CFR 65	Establishes requirements relating to potential loss or destruction of significant scientific, historical, or archeological data as a result of a proposed remedy.	Not applicable	There are no historic or archeological areas at Site 57.
State					
Endangered Species	Threatened and Endangered Species	COMAR 08.03.08	Provides for consideration of the impacts on endangered, threatened, and rare species and their critical habitats.	Not applicable	There are no endangered, threatened, or rare species or critical habitats at Site 57.
Water Resources (Environment Article, Title 5)	Construction on Nontidal Waters and Floodplains	COMAR 26.17.04	Governs water obstructions or changes to a stream or body of water.	Not applicable	Remedial alternatives for Site 57 are not expected to impact surface water bodies. Site 57 is not located in a floodplain.
	Nontidal Wetland Regulations	COMAR 26.23	Establishes requirements for activities in nontidal wetlands.	Not applicable	There are no nontidal wetlands at, or that could be affected by, remedial activities at Site 57.

TABLE 3-2

LOCATION-SPECIFIC ARARs AND TBCs
SITE 57 – BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Act/Authority	Criteria/Issues	Citation	Brief Description	Status	Consideration in the EE/CA
Wetlands and Riparian Rights (Environment Article, Title 16)	Tidal Wetland Regulations	COMAR 26.24	Establishes requirements for activities in tidal wetlands.	Not applicable	There are no tidal wetlands at, or that could be affected by, remedial activities at Site 57.

Notes:

ARARs	Applicable or relevant and appropriate requirements.
CFR	Code of Federal Regulations.
COMAR	Code of Maryland Regulations.
EE/CA	Engineering Evaluation/Cost Analysis.
E.O.	Executive Order.
TBCs	To Be Considered Criteria.
USC	United States Code.

TABLE 3-3

ACTION-SPECIFIC ARARs AND TBCs
SITE 57 – BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD MARYLAND

Act/Authority	Criteria/Issues	Citation	Brief Description	Status	Considerations in the EE/CA
Federal					
Clean Air Act	National Ambient Air Quality Standards	40 CFR 50	Establishes primary (health-based) and secondary (welfare-based) air quality standards for carbon monoxide, lead, nitrogen oxides, particulate matter, ozone, and sulfur oxides emitted from a major source of emissions.	Potentially relevant and appropriate	Fugitive dust (particulate matter) and other criteria pollutants may be generated during soil excavation, handling, or treatment activities.
	New Source Performance Standards (NSPS)	40 CFR 60	Establishes source-specific emissions standards.	Potentially relevant and appropriate	Air pollutants may be discharged during soil treatment activities.
	National Emission Standards for Hazardous Air Pollutants (NESHAPs)	40 CFR 61 and 40 CFR 63	Establishes emissions standards for particular air contaminants from specific sources.	Potentially relevant and appropriate	Hazardous air pollutants may be discharged during soil treatment activities.
EPA Superfund Guidance	Control of Air Emissions from Air Strippers	OSWER Directive 9344.0-28	Emission controls are required for an air stripper if actual or potential VOC emission rates are exceeded in an ozone nonattainment area.	To be considered	Charles County, Maryland is in a nonattainment area for ozone. Guidelines are suitable for VOC emissions from vented extraction techniques (e.g., soil vapor extraction).
Resource Conservation and Recovery Act (Subtitle C)	Identification and Listing of Hazardous Waste	40 CFR 261	Identifies those solid wastes that are subject to regulation as a hazardous waste.	Potentially applicable	Spent TCE from Building 292 operations is a listed hazardous waste.

TABLE 3-3

ACTION-SPECIFIC ARARs AND TBCs
SITE 57 – BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD MARYLAND

Act/Authority	Criteria/Issues	Citation	Brief Description	Status	Considerations in the EE/CA
Resource Conservation and Recovery Act (Subtitle C)	Standards Applicable to Generators of Hazardous Waste	40 CFR 262	Establishes standards for generators of hazardous waste.	Potentially applicable	These standards would be applicable for hazardous wastes shipped off site for disposal.
	Standards Applicable to Transporters of Hazardous Waste	40 CFR 263	Establishes standards for transportation of hazardous waste.	Potentially applicable	These standards would be applicable for hazardous wastes shipped off site for disposal.
	Standards for Owners and Operators of Hazardous Waste TSD Facilitites	40 CFR 264	Establishes minimum national standards for acceptable management of hazardous waste.	Potentially applicable or relevant and appropriate	These standards would be applicable for on-site treatment or disposal of hazardous waste and relevant and appropriate for nonhazardous waste.
	Land Disposal Restrictions	40 CFR 268	Identifies hazardous wastes that are restricted from land disposal and waste analysis requirements.	Potentially applicable	These restrictions would apply if excavated soil was classified as a hazardous waste.
RCRA (Subtitle D)	Criteria for Municipal Solid Waste Landfills	40 CFR 258	Subpart F contains requirements for closure and post-closure care.	Not applicable	Site 57 does not include a landfill.

TABLE 3-3

ACTION-SPECIFIC ARARs AND TBCs
SITE 57 – BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD MARYLAND

Act/Authority	Criteria/Issues	Citation	Brief Description	Status	Considerations in the EE/CA
State					
Ambient Air Quality Control (Environment Article, Title 2)	Ambient Air Quality Standards	COMAR 26.11.04	Establishes ambient standards for particulate matter, sulfur oxides, carbon monoxide, ozone, nitrogen oxides, lead, and fluoride.	Potentially applicable	Fugitive dust and other criteria pollutants may be generated during soil excavation, handling, or treatment activities.
	General Emission Standards, Prohibitions, and Restrictions	COMAR 26.11.06	Establishes emission standards for visible emissions, particulate matter, carbon monoxide, sulfur compounds, VOCs, and fluoride and control of NSPS sources.	Potentially applicable	Fugitive dust and other criteria pollutants may be generated during soil excavation, handling, or treatment activities
	Toxic Air Pollutants	COMAR 26.11.15 and 26.11.16	Establishes standards for industries that emit toxic air pollutants, including sources regulated by NESHAPs.	Potentially relevant and appropriate	Hazardous air pollutants may be discharged during soil treatment activities.
Hazardous Materials and Hazardous Substances (Environment Article, Title 7)	Identification and Listing of Hazardous Waste	COMAR 26.13.02	Identifies those solid wastes that are subject to regulation as a hazardous waste.	Potentially applicable	Spent TCE from Building 292 operations is a listed hazardous waste.
	Standards Applicable to Generators of Hazardous Waste	COMAR 26.13.03	Establishes standards for generators of hazardous waste.	Potentially applicable	These standards would be applicable for hazardous wastes shipped off site for disposal.
	Standards Applicable to Transporters of Hazardous Waste	COMAR 26.13.04	Establishes standards for transportation of hazardous waste.	Potentially applicable	These standards would be applicable for hazardous wastes shipped off site for disposal.

TABLE 3-3

ACTION-SPECIFIC ARARs AND TBCs
SITE 57 – BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD MARYLAND

Act/Authority	Criteria/Issues	Citation	Brief Description	Status	Considerations in the EE/CA
Hazardous Materials and Hazardous Substances (Environment Article, Title 7) (Continued)	Standards for Owners and Operators of Hazardous Waste TSD Facilitites	COMAR 26.13.05	Establishes minimum standards for acceptable management of hazardous waste.	Potentially applicable or relevant and appropriate	These standards would be applicable for on-site treatment or disposal of hazardous waste and relevant and appropriate for nonhazardous waste.
Regulation of Water Supply, Sewage Disposal, and Solid Wastes (Environment Article, Title 9)	Solid Waste Management – Closure of Sanitary Landfills	COMAR 26.04.07	Contains requirements for closure and post-closure care of land disposal facilities.	Not applicable	Site 57 does not include a landfill.

Notes:
ARARs Applicable or relevant and appropriate requirements.
CFR Code of Federal Regulations.
COMAR Code of Maryland Regulations.
EE/CA Engineering Evaluation/Cost Analysis.
OSWER Office of Solid Waste and Emergency Response.
RCRA Resource Conservation and Recovery Act
TBCs To Be Considered Criteria.
TCE Trichloroethene.
TSD Treatment, storage, and disposal.
VOC Volatile organic compound.

TABLE 3-4

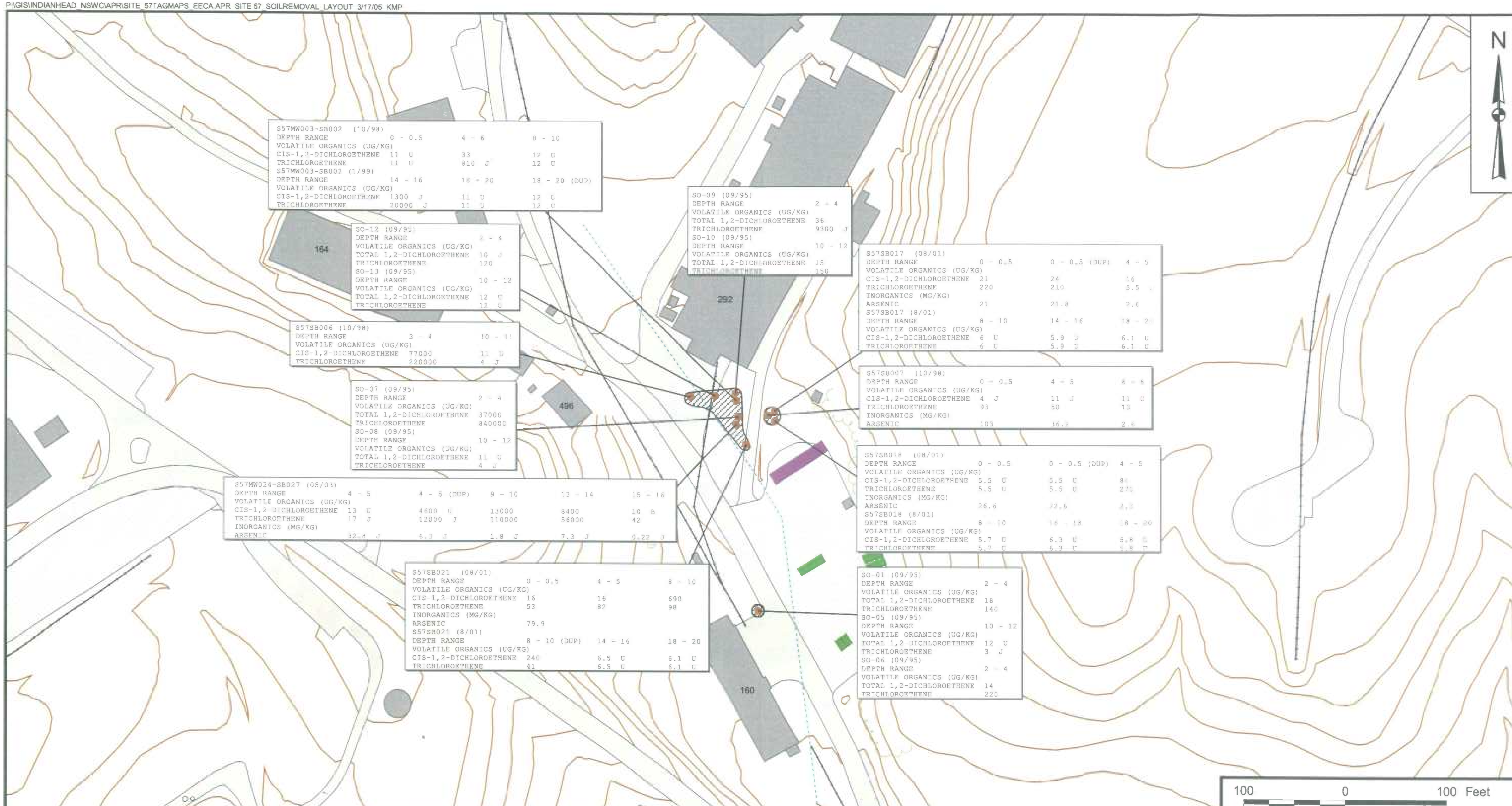
TECHNOLOGY SCREENING
SITE 57- BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Technology	Process Options	Description	Screening Comments
No Action	Not applicable	No activities conducted to address contamination.	Required by NCP. Retain for baseline comparison.
Containment	Capping (Clay, synthetic membrane, asphalt, or multimedia cap)	Low-permeability barriers to minimize exposure to contaminants and contaminant migration to groundwater.	High vehicular and pedestrian traffic results in the need for periodic maintenance the frequency of which depends on the cap material. Leaving the contaminated soil in place restricts the potential uses of the site and requires periodic inspections. Installing a cap requires excavating and disposing of soil under the area to be capped if existing grades are to be maintained. Eliminate this technology.
	Vertical Barriers (Slurry wall, grout curtain, and sheet piling)	Low-permeability barriers to restrict horizontal migration of contaminants.	Long-term effectiveness is difficult to monitor and difficult to repair once leaks are detected. Installation at this site is complicated by the presence of below-grade utilities. Below grade utilities must be accommodated by penetrations which are susceptible to leaking. Future utility repairs and installation are complicated and made more expensive by the vertical barrier. Leaving contamination in place restricts the potential uses of the site and requires periodic inspections. Eliminate this technology.
Excavation	Excavation	Use of common construction equipment to remove contaminated soil.	Easily implemented although care is required to protect existing utilities. Once the remediation is completed, utilities are no longer a consideration. No restrictions are needed on site use, and no post-remediation periodic inspections are required. Well suited to small soil volumes. Retain this technology.

TECHNOLOGY SCREENING
SITE 57- BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Technology	Process Options	Description	Screening Comments
In-Situ Treatment	Soil vapor extraction (SVE)	Use of vacuum and/or air sparging to volatilize and remove contaminants from the vadose zone.	An SVE pilot study demonstrated that site soil above the groundwater table exhibited little to no permeability. SVE does not address metals contamination. Eliminate this technology.
	Multi-phase extraction (MPE)	Use of vacuum and pumping to volatilize and remove contaminants from above and below the water table.	An SVE pilot study demonstrated that site soil above the groundwater table exhibited little to no permeability. MPE does not address metals contamination. Additional costs are required to treat extracted groundwater. Eliminate this technology.
Ex-Situ Treatment	Low-temperature thermal desorption	Use of low to moderate temperatures to volatilize contaminants.	Does not avoid the need to excavate contaminated soil. Mobilization costs are relatively high for small soil volumes. This technology is not effective for metals. Residual arsenic concentrations would preclude using the treated soil for backfill material. Eliminate this technology.
	Incineration	Use of high temperature to destroy organic contaminants.	Does not avoid the need to excavate contaminated soil. Mobilization costs are relatively high for small soil volumes. This technology is not effective for arsenic. Residual arsenic concentrations would preclude using the treated soil for backfill material. Eliminate this technology.
Off-Site Disposal	Landfill (Hazardous or nonhazardous waste landfill)	Disposal of excavated material at a permitted on-site or off-site landfill.	Below-grade utilities require care during excavation, but there are no post-remediation utility concerns with respect to maintenance, repair, or installation of utilities. There are no post-remediation restrictions on the use of the site. Cost is reasonable for small soil volumes. Retain this technology.

P:\GIS\INDIANHEAD_NSWC\APR\SITE_57TAGMAPS_EECA.APR SITE 57_SOILREMOVAL_LAYOUT 3/17/05 KMP



LEGEND

Symbol	Description
●	Soil Sample Location
	Topographic Contour (Contour Interval = 5 ft.)
	Intermittent Stream
	Railroad
	Storm Sewer
	Parking Area
	Building
	Trailer
	Cargo Box
	Area Of Excavation
	Road
J	Estimated Concentration
U	Not Detected at or Above Concentration Shown
MG/KG	Milligram per Kilogram
UG/KG	Microgram per Kilogram

DRAWN BY: K. PEILA	DATE: 3/17/05
CHECKED BY: G. LATULIPPE	DATE: 3/17/05
COST/SCHEDULE-AREA	
SCALE: AS NOTED	

Tetra Tech NUS, Inc.

AREAS OF SOIL REMOVAL ACTION
SITE 57 - BUILDING 292 TCE CONTAMINATION
NAVAL DISTRICT WASHINGTON, INDIAN HEAD
INDIAN HEAD, MARYLAND

CONTRACT NUMBER 2144	OWNER NUMBER 0005
APPROVED BY GJL	DATE 3/17/05
APPROVED BY __	DATE __
DRAWING NO. FIGURE 3-1	REV 0

4.0 IDENTIFICATION AND ANALYSIS OF REMOVAL ACTION ALTERNATIVES

Removal action alternatives for remediation of soil contaminated with cis-1,2-DCE, TCE, and arsenic at NDW-IH Site 57, Building 292 TCE Contamination, were developed and evaluated. Alternative 1 is the no action alternative. Alternative 2 includes excavation and off-site disposal of contaminated soil.

The following sections describe and evaluate these alternatives based on effectiveness, implementability, and cost.

4.1 ALTERNATIVE 1: NO ACTION

The no-action alternative is evaluated to provide a comparative baseline against which other alternatives can be evaluated. Under this alternative, no removal action will be taken and the site is left "as is" without the implementation of any removal, treatment, or other mitigating actions.

Currently, contaminated soil exists at the Building 292 TCE Contamination area. Without remediation, human receptors could contact contaminated soil, and soil contaminants could continue to migrate to groundwater.

4.1.1 Effectiveness

The no-action alternative would not be effective and would not achieve the RAOs. Potential risks to humans and the environment at the site would remain.

4.1.2 Implementability

Under the no-action alternative, no removal action would be taken; therefore, there would not be difficulties or uncertainties associated with implementation.

4.1.3 Cost

There would be no costs associated with this alternative.

4.2 ALTERNATIVE 2: EXCAVATION AND OFF-SITE DISPOSAL

Alternative 2 would consist of excavating the contaminated soil at the Building 292 TCE Contamination with disposal at a permitted hazardous waste landfill. The areas to be excavated are presented on Figure 3-1. These excavation limits were developed by comparing surface and subsurface soil sample

UCL concentrations to the PRGs. Based on the areas and depths, a total of approximately 606 cubic yards of soil would be excavated and disposed off site.

The initial phase of the removal action would be the implementation of erosion and sediment controls to reduce the migration of soil contaminants to downgradient areas, including Mattawoman Creek. The erosion and sediment controls would be implemented before the remaining portions of the removal action are implemented.

Staging area(s) would be constructed for temporary handling of contaminated soil before off-site transport. A temporary decontamination pad would also be constructed. Equipment and vehicles used during site preparation, excavation, and soil handling would be cleaned and decontaminated at this location. The actual size, design, and location of the staging area(s) would be determined during the remedial design phase.

Contaminated soil would be excavated using common excavation equipment. Samples would be collected from the bottoms and sides of the excavations to verify that UCL residual chemical concentrations remaining after excavation were less than PRGs and that appropriate amounts of soil were removed.

Land Disposal Restriction (LDR) requirements restrict certain hazardous wastes from being placed or disposed on the land unless they meet specific treatment standards. Therefore, the excavated soil would be analyzed before disposal. The soil is contaminated with a listed hazardous waste (i.e., spent TCE). Soil with chemical concentrations higher than the LDR treatment standards would need to be treated (on site or off site) prior to disposal in a hazardous waste landfill. Soil with chemical concentrations less than the LDR treatment standards would not need to be treated but would still need to be disposed in a hazardous waste landfill. Analytical data for the site indicates that the average TCE concentration in the soil will be less than the LDR treatment standard for contaminated soil. Therefore, it is assumed that treatment would not be required prior to disposal.

There is a storm sewer and several underground utilities in the area of excavation that may be damaged during excavation. This sewer and any other underground utilities that may be affected would be replaced or repaired.

After all contaminated soil has been removed, the excavated areas would be regraded or backfilled with clean fill and then vegetated. The staging area and decontamination pad would be removed.

4.2.1 Effectiveness

Excavation and off-site disposal would mitigate risks to human health and the environment by removing contaminated soil. This alternative would also eliminate the potential for migration of soil contaminants to groundwater.

It is anticipated that excavation, off-site disposal, and backfilling activities would comply with ARARs.

This alternative is expected to provide long-term effectiveness and permanence in removing contaminated soil from the site. Excavation and off-site disposal have been used at numerous CERCLA sites to remove contaminated soil.

The toxicity, mobility, and volume of contaminants present in the soil would not be reduced using this alternative.

Hauling a large quantity of material off site would have a short-term impact on the community by generating additional traffic. Although there would be a potential for spills of contaminated soil during transport, all materials would be solids that could easily be redeposited into the transport container. Any dust that would be generated could be adequately controlled. Exposure of workers during remediation would be minimized through use of proper personal protective equipment and health and safety standards. Erosion and sediment controls would be needed to control off-site migration of soil contaminants during removal activities.

4.2.2 Implementability

Excavation and off-site disposal are common remediation methods. It is anticipated that no shoring of the excavation would be needed because the excavation depth is relatively shallow. There will be no excavation below the water table so no dewatering would be required. Excavation and off-site disposal could be implemented with common construction equipment and transportation methods. Personnel trained to excavate contaminated soils and laboratories experienced at testing hazardous waste are readily available. Disposal capacity for the anticipated quantity of contaminated soil is available. No long-term O&M would be necessary for this alternative.

This alternative could be implemented in less than 1 year. Institutional controls to limit access to the site or future site uses (with respect to soil contamination) would not be required.

4.2.3 Cost

The total estimated capital cost for Alternative 2 is $330,927. A detailed cost estimate, including backup calculations, is presented in Appendix C.

5.0 COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES

In this section, the alternatives are evaluated in relation to one another for each of the evaluation criteria. The purpose of this analysis is to identify the relative advantages and disadvantages of each alternative. Table 5-1 summarizes the comparative analysis for the alternatives for Site 57, Building 292 TCE Contamination.

5.1 EFFECTIVENESS

Alternative 2 (Excavation and Off-Site Disposal) would provide adequate protection of human health and the environment. Alternative 2 provides protection by removing the contaminated soil from the site. Alternative 2 includes implementation of erosion and sediment controls to reduce the migration of soil contaminants to downgradient areas, including Mattawoman Creek during excavation.

Alternative 1 would not comply with chemical-specific ARARs and TBCs. It is anticipated that Alternative 2 would comply with all ARARs and TBCs.

Alternative 1 would not be effective over the long term because the soil contaminants would remain at the site. Alternative 2 is expected to provide long-term effectiveness and permanence by removing contaminated soil from the site.

Alternatives 1 and 2 do not provide treatment to reduce the toxicity, mobility, or volume of the contaminants or soil.

There are no short-term impacts to the community under Alternative 1. For Alternative 2, hauling a large quantity of material off site would have a short-term impact on the community by generating additional traffic. Although there would be a potential for spills of contaminated soil during transport, all materials would be solids that could easily be redeposited into the transport container. Any dust that would be generated under Alternative 2 could be adequately controlled.

There are no short-term impacts to workers under Alternative 1. For Alternative 2, exposure of workers during remediation would be minimized through use of proper protective equipment and health and safety standards.

There are no short-term impacts to the environment under Alternative 1. Activities proposed under Alternative 2 would not affect the surrounding environment. Erosion and sediment controls would be needed to control off-site migration of soil contaminants during excavation activities.

5.2 IMPLEMENTABILITY

Both of the removal action alternatives are implementable. Nothing would be implemented under Alternative 1. The excavation activities under Alternative 2 can be implemented with common construction equipment.

Disposal capacity for the volume of soil excavated under Alternative 2 is available.

It is expected that Alternative 2 could be implemented in 1 year or less. There would be nothing to implement under Alternative 1.

Institutional controls would not be required under Alternative 2.

5.3 COST

The estimated capital costs of the alternatives would be as follows:

Alternative 1: $0
Alternative 2: $330,927

5.4 CONCLUSIONS

Alternative 2 (Excavation and Off-Site Disposal) provides the best balance of trade-offs based on the evaluation criteria. Alternative 1 (No Action) is not protective of human health or the environment.

TABLE 5-1

SUMMARY OF EVALUATION OF ALTERNATIVES
SITE 57 – BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Evaluation Criteria	Alternative 1 – No Action	Alternative 2 – Excavation and Off-Site Disposal
Effectiveness	No reduction in potential risks to human health or the environment. Would not comply with ARARs. Allows contaminants to remain at the site. No reduction in toxicity, mobility, or volume. No short-term impacts or concerns.	Provides protection by removing contaminated soil. Would comply with ARARs. Contaminants would be removed from the site. No reduction in toxicity, mobility, or volume. Hauling soil off site would have short-term effects on the community. Exposure of workers to contaminants can be adequately controlled. Includes erosion and sediment controls to reduce off-site migration of soil contaminants.
Implementability	Nothing to implement.	Consists of common remediation practices that are readily available and implementable. Could be implemented in less than 1 year. No institutional controls required.
Capital Cost	$0	$330,927

ARARs Applicable or relevant and appropriate requirements.

REFERENCES

B&R Environmental (Brown and Root Environmental), 1996. Data Report for Subsurface Investigation, IR Site 57, Former Drum Loading Area, Building 292, Indian Head Division, Naval Surface Warfare Center, Indian Head, Maryland, March.

B&R Environmental, 1997. Findings Report for Soil Vapor Extraction Pilot Study, Indian Head Division, Naval Surface Warfare Center, Indian Head, Maryland, May.

B&R Environmental, 1998. Draft Engineering Evaluation Cost Analysis (EE/CA) for IR Site 57, Former Drum Loading Area, Building 292, Indian Head Division, Naval Surface Warfare Center, Indian Head, Maryland, June.

Hart (Fred C. Hart Associates, Inc.), 1983. Initial Assessment Study, Naval Ordnance Station, Indian Head, Maryland. New York, New York.

TtNUS (Tetra Tech NUS, Inc.), 2000. Remedial Investigation Report for IR Site 57, Former Drum Loading Area Building 292, Indian Head Division, Naval Surface Warfare Center, Indian Head Maryland. King of Prussia, Pennsylvania, July.

TtNUS, 2002. Draft Feasibility Study Report for Site 57 – Former Drum Loading Area, Indian Head Division Naval Surface Warfare Center, Indian Head, Maryland. King of Prussia, Pennsylvania, May.

TtNUS, 2004. In Situ Anaerobic Bioremediation Pilot Study at Site 57 – Building 292 TCE Contamination Area, Naval District Washington, Indian Head, Indian Head, Maryland. King of Prussia, Pennsylvania, March.

APPENDIX A

ANALYTICAL DATABASE

A.1 SOIL-GAS SURVEY RESULTS

A.2 REMEDIAL INVESTIGATION, FEASIBILITY STUDY, AND IN-SITU ANAEROBIC BIOREMEDIATION PILOT STUDY

A.1 SOIL-GAS SURVEY RESULTS

SOIL-GAS SURVEY SOIL SAMPLE RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND
PAGE 1 OF 2

Round	1995Q3	1995Q3	1995Q3	1995Q3	1995Q3	1995Q3	1995Q3	1995Q3	1995Q3
Location	UNDEFINED	UNDEFINED	UNDEFINED	UNDEFINED	UNDEFINED	UNDEFINED	UNDEFINED	UNDEFINED	UNDEFINED
Sample ID	SO-01-24	SO-05-1012	SO-06-24	SO-07-24	SO-08-1012	SO-09-24	SO-10-1012	SO-12-24	SO-13-1012
Depth Range	2 - 4	10 - 12	2 - 4	2 - 4	10 - 12	2 - 4	10 - 12	2 - 4	10 - 12
Sample Date	9/26/1995	9/26/1995	9/26/1995	9/26/1995	9/26/1995	9/26/1995	9/26/1995	9/26/1995	9/26/1995
Volatile Organics (ug/kg)									
1,1,1-TRICHLOROETHANE	12 U	12 U	12 U	12 U	11 U	10	4 J	5 J	12 U
1,1,2,2-TETRACHLOROETHANE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
1,1,2-TRICHLOROETHANE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
1,1-DICHLOROETHANE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
1,1-DICHLOROETHENE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
1,2-DICHLOROETHANE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
1,2-DICHLOROPROPANE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
2-BUTANONE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
2-HEXANONE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
4-METHYL-2-PENTANONE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
ACETONE	160 J	99 J	150 J	85 J	82 J	34 B	12 U	12 B	16 B
BENZENE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
BROMODICHLOROMETHANE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
BROMOFORM	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
BROMOMETHANE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
CARBON DISULFIDE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
CARBON TETRACHLORIDE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
CHLOROBENZENE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
CHLORODIBROMOMETHANE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
CHLOROETHANE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
CHLOROFORM	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
CHLOROMETHANE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
CIS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
ETHYLBENZENE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
METHYLENE CHLORIDE	9 B	4 B	4 B	8 B	3 B	7 B	4 B	4 B	8 B
STYRENE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
TETRACHLOROETHENE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
TOLUENE	5 B	4 B	3 B	4 B	3 B	13 B	6 B	6 B	24 B

SOIL-GAS SURVEY SOIL SAMPLE RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1995Q3	1995Q3	1995Q3	1995Q3	1995Q3	1995Q3	1995Q3	1995Q3	1995Q3
Location	UNDEFINED	UNDEFINED	UNDEFINED	UNDEFINED	UNDEFINED	UNDEFINED	UNDEFINED	UNDEFINED	UNDEFINED
Sample ID	SO-01-24	SO-05-1012	SO-06-24	SO-07-24	SO-08-1012	SO-09-24	SO-10-1012	SO-12-24	SO-13-1012
Depth Range	2 - 4	10 - 12	2 - 4	2 - 4	10 - 12	2 - 4	10 - 12	2 - 4	10 - 12
Sample Date	9/26/1995	9/26/1995	9/26/1995	9/26/1995	9/26/1995	9/26/1995	9/26/1995	9/26/1995	9/26/1995
TOTAL 1,2-DICHLOROETHENE	18	12 U	14	37000	11 U	36	15	10 J	12 U
TOTAL XYLENES	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
TRANS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U
TRICHLOROETHENE	140	3 J	220	840000	4 J	9300 J	150	120	12 U
VINYL CHLORIDE	12 U	12 U	12 U	12 U	11 U	12 U	12 U	11 U	12 U

A.2 REMEDIAL INVESTIGATION, FEASIBILITY STUDY, AND IN-SITU ANAEROBIC BIOREMEDIATION PILOT STUDY

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1
Location	S57MW001-SB001	S57MW001-SB001	S57MW001-SB001	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002
Sample ID	S57SS0010101	S57SB0010101	S57SB0010201	S57SS0020101	S57SB0020101	S57SB0020201	S57SB0020301
Depth Range	0 - 0.5	2 - 4	4 - 6	0 - 0.5	4 - 6	8 - 10	14 - 16
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	1/7/1999
Volatile Organics (ug/kg)							
1,1,1-TRICHLOROETHANE	11 UJ	12 U	13 U	11 U	14 U	12 U	2 J
1,1,2,2-TETRACHLOROETHANE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
1,1,2-TRICHLOROETHANE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
1,1,2-TRICHLOROTRIFLUOROETHANE							
1,1-DICHLOROETHANE	11 U	12 U	13 U	11 U	14 U	12 U	11 UJ
1,1-DICHLOROETHENE	11 U	12 U	13 U	11 U	14 U	12 U	11 UJ
1,2-DICHLOROETHANE	11 U	12 U	13 U	11 U	14 U	12 U	11 UJ
1,2-DICHLOROPROPANE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
2-BUTANONE	11 UJ	12 UJ	13 UJ	11 UJ	14 UJ	12 UJ	11 UJ
2-HEXANONE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
4-METHYL-2-PENTANONE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
ACETONE	11 U	16 J	13 U	11 U	14 U	12 U	11 UJ
BENZENE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
BROMODICHLOROMETHANE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
BROMOFORM	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
BROMOMETHANE	11 U	12 U	13 U	11 U	14 U	12 U	11 UJ
CARBON DISULFIDE	11 U	1 J	13 U	11 U	14 U	12 U	11 UJ
CARBON TETRACHLORIDE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
CHLOROBENZENE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
CHLORODIBROMOMETHANE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
CHLOROETHANE	11 U	12 U	13 U	11 U	14 U	12 U	11 UJ
CHLOROFORM	11 U	12 U	13 U	11 U	14 U	12 U	11 UJ
CHLOROMETHANE	11 U	6 B	13 U	11 U	14 U	12 U	11 UJ
CIS-1,2-DICHLOROETHENE	11 UJ	12 U	3 J	11 U	33	12 U	1300 J
CIS-1,3-DICHLOROPROPENE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
CYCLOHEXANE							
DIETHYL ETHER	11 U	12 U	13 UJ	11 U	14 U	12 U	12 J
ETHYLBENZENE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1
Location	S57MW001-SB001	S57MW001-SB001	S57MW001-SB001	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002
Sample ID	S57SS0010101	S57SB0010101	S57SB0010201	S57SS0020101	S57SB0020101	S57SB0020201	S57SB0020301
Depth Range	0 - 0.5	2 - 4	4 - 6	0 - 0.5	4 - 6	8 - 10	14 - 16
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	1/7/1999
ISOPROPYLBENZENE							
M+P-XYLENES							
METHYL ACETATE							
METHYL CYCLOHEXANE							
METHYL TERT-BUTYL ETHER							
METHYLENE CHLORIDE	12 B	18 B	29 B	17 B	32 B	17 B	8 B
O-XYLENE							
STYRENE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
TETRACHLOROETHENE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
TOLUENE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
TOTAL XYLENES	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
TRANS-1,2-DICHLOROETHENE	11 UJ	12 U	13 U	11 U	14 U	12 U	3 J
TRANS-1,3-DICHLOROPROPENE	11 UJ	12 U	13 U	11 U	14 U	12 U	11 UJ
TRICHLOROETHENE	13 J	12 U	3 J	11 U	810 J	12 U	20000 J
VINYL CHLORIDE	11 UJ	12 U	13 U	11 U	14 U	12 U	8 J
Semivolatile Organics (ug/kg)							
1,2,4-TRICHLOROBENZENE							
1,2-DICHLOROBENZENE							
1,3,5-TRINITROBENZENE							
1,3-DICHLOROBENZENE							
1,4-DICHLOROBENZENE							
2,2'-OXYBIS(1-CHLOROPROPANE)							
2,4,5-TRICHLOROPHENOL							
2,4,6-TRICHLOROPHENOL							
2,4-DICHLOROPHENOL							
2,4-DIMETHYLPHENOL							
2,4-DINITROPHENOL							
2,4-DINITROTOLUENE							
2,6-DINITROTOLUENE							

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1
Location	S57MW001-SB001	S57MW001-SB001	S57MW001-SB001	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002
Sample ID	S57SS0010101	S57SB0010101	S57SB0010201	S57SS0020101	S57SB0020101	S57SB0020201	S57SB0020301
Depth Range	0 - 0.5	2 - 4	4 - 6	0 - 0.5	4 - 6	8 - 10	14 - 16
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	1/7/1999
2-CHLORONAPHTHALENE							
2-CHLOROPHENOL							
2-METHYLNAPHTHALENE							
2-METHYLPHENOL							
2-NITROANILINE							
2-NITROPHENOL							
3,3'-DICHLOROBENZIDINE							
3-NITROANILINE							
4,6-DINITRO-2-METHYLPHENOL							
4-BROMOPHENYL PHENYL ETHER							
4-CHLORO-3-METHYLPHENOL							
4-CHLOROANILINE							
4-CHLOROPHENYL PHENYL ETHER							
4-METHYLPHENOL							
4-NITROANILINE							
4-NITROPHENOL							
ACENAPHTHENE							
ACENAPHTHYLENE							
ANTHRACENE							
BENZO(A)ANTHRACENE							
BENZO(A)PYRENE							
BENZO(B)FLUORANTHENE							
BENZO(G,H,I)PERYLENE							
BENZO(K)FLUORANTHENE							
BIS(2-CHLOROETHOXY)METHANE							
BIS(2-CHLOROETHYL)ETHER							
BIS(2-ETHYLHEXYL)PHTHALATE							
BUTYL BENZYL PHTHALATE							
CARBAZOLE							

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1
Location	S57MW001-SB001	S57MW001-SB001	S57MW001-SB001	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002
Sample ID	S57SS0010101	S57SB0010101	S57SB0010201	S57SS0020101	S57SB0020101	S57SB0020201	S57SB0020301
Depth Range	0 - 0.5	2 - 4	4 - 6	0 - 0.5	4 - 6	8 - 10	14 - 16
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	1/7/1999
CHRYSENE							
DI-N-BUTYL PHTHALATE							
DI-N-OCTYL PHTHALATE							
DIBENZO(A,H)ANTHRACENE							
DIBENZOFURAN							
DIETHYL PHTHALATE							
DIMETHYL PHTHALATE							
FLUORANTHENE							
FLUORENE							
HEXACHLOROBENZENE							
HEXACHLOROBUTADIENE							
HEXACHLOROCYCLOPENTADIENE							
HEXACHLOROETHANE							
INDENO(1,2,3-CD)PYRENE							
ISOPHORONE							
N-NITROSO-DI-N-PROPYLAMINE							
N-NITROSODIPHENYLAMINE							
NAPHTHALENE							
NITROBENZENE							
PENTACHLOROPHENOL							
PHENANTHRENE							
PHENOL							
PYRENE							
Pesticides/PCBs (ug/kg)							
4,4'-DDD							
4,4'-DDE							
4,4'-DDT							
ALDRIN							
ALPHA-BHC							

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1
Location	S57MW001-SB001	S57MW001-SB001	S57MW001-SB001	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002
Sample ID	S57SS0010101	S57SB0010101	S57SB0010201	S57SS0020101	S57SB0020101	S57SB0020201	S57SB0020301
Depth Range	0 - 0.5	2 - 4	4 - 6	0 - 0.5	4 - 6	8 - 10	14 - 16
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	1/7/1999
ALPHA-CHLORDANE							
AROCLOR-1016							
AROCLOR-1221							
AROCLOR-1232							
AROCLOR-1242							
AROCLOR-1248							
AROCLOR-1254							
AROCLOR-1260							
BETA-BHC							
DELTA-BHC							
DIELDRIN							
ENDOSULFAN I							
ENDOSULFAN II							
ENDOSULFAN SULFATE							
ENDRIN							
ENDRIN ALDEHYDE							
ENDRIN KETONE							
GAMMA-BHC (LINDANE)							
GAMMA-CHLORDANE							
HEPTACHLOR							
HEPTACHLOR EPOXIDE							
METHOXYCHLOR							
TOXAPHENE							
Explosives (ug/kg)							
1,3-DINITROBENZENE							
2,4,6-TRINITROTOLUENE							
2,4-DINITROTOLUENE							
2,6-DINITROTOLUENE							
2-AMINO-4,6-DINITROTOLUENE							

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1
Location	S57MW001-SB001	S57MW001-SB001	S57MW001-SB001	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002
Sample ID	S57SS0010101	S57SB0010101	S57SB0010201	S57SS0020101	S57SB0020101	S57SB0020201	S57SB0020301
Depth Range	0 - 0.5	2 - 4	4 - 6	0 - 0.5	4 - 6	8 - 10	14 - 16
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	1/7/1999
2-NITROTOLUENE							
3-NITROTOLUENE							
4-AMINO-2,6-DINITROTOLUENE							
4-NITROTOLUENE							
HMX							
NITROBENZENE							
NITROCELLULOSE							
NITROGLYCERIN							
NITROGUANIDINE							
RDX							
TETRYL							
Inorganics (mg/kg)							
ALUMINUM							
ANTIMONY							
ARSENIC							
BARIUM							
BERYLLIUM							
CADMIUM							
CALCIUM							
CHROMIUM							
COBALT							
COPPER							
IRON							
LEAD							
MAGNESIUM							
MANGANESE							
MERCURY							
NICKEL							
POTASSIUM							

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1
Location	S57MW001-SB001	S57MW001-SB001	S57MW001-SB001	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002
Sample ID	S57SS0010101	S57SB0010101	S57SB0010201	S57SS0020101	S57SB0020101	S57SB0020201	S57SB0020301
Depth Range	0 - 0.5	2 - 4	4 - 6	0 - 0.5	4 - 6	8 - 10	14 - 16
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	1/7/1999
SELENIUM							
SILVER							
SODIUM							
THALLIUM							
VANADIUM							
ZINC							
Miscellaneous Parameters							
CATION EXCHANGE CAPACITY (MEQ/1)							
PH (MEQ/1)							
PH (S.U.)							
TOTAL ORGANIC CARBON (MG/KG)				7790 L	8120 L	4440 UL	2260 L
TOTAL SOLIDS (%)							
Field Parameters							
BULK DENSITY (PCF)							
POROSITY (%)							
SIEVE 1" (%)							
SIEVE 1-1/2" (%)							
SIEVE 1/2" (%)							
SIEVE 3/4" (%)							
SIEVE 3/8" (%)							
SIEVE NO. 004 (%)							
SIEVE NO. 010 (%)							
SIEVE NO. 020 (%)							
SIEVE NO. 040 (%)							
SIEVE NO. 100 (%)							
SIEVE NO. 200 (%)							
SPECIFIC GRAVITY (S.U.)							

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57SB003	S57SB003	S57SB003
Sample ID	S57SB0020401	S57SB0020501	S57SB0020601	S57SB0020601-D	S57SB0030101	S57SB0030101-D	S57SB0030201
Depth Range	6 - 8	24 - 25	18 - 20	18 - 20	3 - 4	3 - 4	4 - 6
Sample Date	1/7/1999	1/7/1999	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
Volatile Organics (ug/kg)							
1,1,1-TRICHLOROETHANE			11 U	12 U	12 U	13 UJ	12 U
1,1,2,2-TETRACHLOROETHANE			11 U	12 U	12 U	13 UJ	12 U
1,1,2-TRICHLOROETHANE			11 U	12 U	12 U	13 UJ	12 U
1,1,2-TRICHLOROTRIFLUOROETHANE							
1,1-DICHLOROETHANE			11 U	12 U	12 U	13 UJ	12 U
1,1-DICHLOROETHENE			11 U	12 U	12 U	13 UJ	12 U
1,2-DICHLOROETHANE			11 U	12 U	12 U	13 UJ	12 U
1,2-DICHLOROPROPANE			11 U	12 U	12 U	13 UJ	12 U
2-BUTANONE			11 U	12 U	12 UJ	13 UJ	12 UJ
2-HEXANONE			11 U	12 U	12 U	13 UJ	12 U
4-METHYL-2-PENTANONE			11 U	12 U	12 U	13 UJ	12 U
ACETONE			11 U	12 U	12 U	13 UJ	12 U
BENZENE			11 U	12 U	12 U	13 UJ	12 U
BROMODICHLOROMETHANE			11 U	12 U	12 U	13 UJ	12 U
BROMOFORM			11 U	12 U	12 U	13 UJ	12 U
BROMOMETHANE			11 U	12 U	12 U	13 UJ	12 U
CARBON DISULFIDE			11 U	12 U	12 U	13 UJ	12 U
CARBON TETRACHLORIDE			11 U	12 U	12 U	13 UJ	12 U
CHLOROBENZENE			11 U	12 U	12 U	13 UJ	12 U
CHLORODIBROMOMETHANE			11 U	12 U	12 U	13 UJ	12 U
CHLOROETHANE			11 U	12 U	12 U	13 UJ	12 U
CHLOROFORM			11 U	12 U	12 U	13 UJ	12 U
CHLOROMETHANE			11 U	12 U	12 U	13 UJ	12 U
CIS-1,2-DICHLOROETHENE			11 U	12 U	12 U	13 UJ	12 U
CIS-1,3-DICHLOROPROPENE			11 U	12 U	12 U	13 UJ	12 U
CYCLOHEXANE							
DIETHYL ETHER			11 U	12 U	12 UJ	13 UJ	12 UJ
ETHYLBENZENE			11 U	12 U	12 U	13 UJ	12 U

Round	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57SB003	S57SB003	S57SB003
Sample ID	S57SB0020401	S57SB0020501	S57SB0020601	S57SB0020601-D	S57SB0030101	S57SB0030101-D	S57SB0030201
Depth Range	6 - 8	24 - 25	18 - 20	18 - 20	3 - 4	3 - 4	4 - 6
Sample Date	1/7/1999	1/7/1999	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
ISOPROPYLBENZENE							
M+P-XYLENES							
METHYL ACETATE							
METHYL CYCLOHEXANE							
METHYL TERT-BUTYL ETHER							
METHYLENE CHLORIDE			11 B	11 B	23 B	23 B	26 B
O-XYLENE							
STYRENE			11 U	12 U	12 U	13 UJ	12 U
TETRACHLOROETHENE			11 U	12 U	12 U	13 UJ	12 U
TOLUENE			1 J	2 J	12 U	13 UJ	12 U
TOTAL XYLENES			11 U	12 U	12 U	13 UJ	12 U
TRANS-1,2-DICHLOROETHENE			11 U	12 U	12 U	13 UJ	12 U
TRANS-1,3-DICHLOROPROPENE			11 U	12 U	12 U	13 UJ	12 U
TRICHLOROETHENE			11 U	12 U	12 U	13 UJ	12 U
VINYL CHLORIDE			11 U	12 U	12 U	13 UJ	12 U
Semivolatile Organics (ug/kg)							
1,2,4-TRICHLOROBENZENE							
1,2-DICHLOROBENZENE							
1,3,5-TRINITROBENZENE							
1,3-DICHLOROBENZENE							
1,4-DICHLOROBENZENE							
2,2'-OXYBIS(1-CHLOROPROPANE)							
2,4,5-TRICHLOROPHENOL							
2,4,6-TRICHLOROPHENOL							
2,4-DICHLOROPHENOL							
2,4-DIMETHYLPHENOL							
2,4-DINITROPHENOL							
2,4-DINITROTOLUENE							
2,6-DINITROTOLUENE							

Round	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57SB003	S57SB003	S57SB003
Sample ID	S57SB0020401	S57SB0020501	S57SB0020601	S57SB0020601-D	S57SB0030101	S57SB0030101-D	S57SB0030201
Depth Range	6 - 8	24 - 25	18 - 20	18 - 20	3 - 4	3 - 4	4 - 6
Sample Date	1/7/1999	1/7/1999	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
2-CHLORONAPHTHALENE							
2-CHLOROPHENOL							
2-METHYLNAPHTHALENE							
2-METHYLPHENOL							
2-NITROANILINE							
2-NITROPHENOL							
3,3'-DICHLOROBENZIDINE							
3-NITROANILINE							
4,6-DINITRO-2-METHYLPHENOL							
4-BROMOPHENYL PHENYL ETHER							
4-CHLORO-3-METHYLPHENOL							
4-CHLOROANILINE							
4-CHLOROPHENYL PHENYL ETHER							
4-METHYLPHENOL							
4-NITROANILINE							
4-NITROPHENOL							
ACENAPHTHENE							
ACENAPHTHYLENE							
ANTHRACENE							
BENZO(A)ANTHRACENE							
BENZO(A)PYRENE							
BENZO(B)FLUORANTHENE							
BENZO(G,H,I)PERYLENE							
BENZO(K)FLUORANTHENE							
BIS(2-CHLOROETHOXY)METHANE							
BIS(2-CHLOROETHYL)ETHER							
BIS(2-ETHYLHEXYL)PHTHALATE							
BUTYL BENZYL PHTHALATE							
CARBAZOLE							

Round	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57SB003	S57SB003	S57SB003
Sample ID	S57SB0020401	S57SB0020501	S57SB0020601	S57SB0020601-D	S57SB0030101	S57SB0030101-D	S57SB0030201
Depth Range	6 - 8	24 - 25	18 - 20	18 - 20	3 - 4	3 - 4	4 - 6
Sample Date	1/7/1999	1/7/1999	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
CHRYSENE							
DI-N-BUTYL PHTHALATE							
DI-N-OCTYL PHTHALATE							
DIBENZO(A,H)ANTHRACENE							
DIBENZOFURAN							
DIETHYL PHTHALATE							
DIMETHYL PHTHALATE							
FLUORANTHENE							
FLUORENE							
HEXACHLOROBENZENE							
HEXACHLOROBUTADIENE							
HEXACHLOROCYCLOPENTADIENE							
HEXACHLOROETHANE							
INDENO(1,2,3-CD)PYRENE							
ISOPHORONE							
N-NITROSO-DI-N-PROPYLAMINE							
N-NITROSODIPHENYLAMINE							
NAPHTHALENE							
NITROBENZENE							
PENTACHLOROPHENOL							
PHENANTHRENE							
PHENOL							
PYRENE							
Pesticides/PCBs (ug/kg)							
4,4'-DDD							
4,4'-DDE							
4,4'-DDT							
ALDRIN							
ALPHA-BHC							

Round	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57SB003	S57SB003	S57SB003
Sample ID	S57SB0020401	S57SB0020501	S57SB0020601	S57SB0020601-D	S57SB0030101	S57SB0030101-D	S57SB0030201
Depth Range	6 - 8	24 - 25	18 - 20	18 - 20	3 - 4	3 - 4	4 - 6
Sample Date	1/7/1999	1/7/1999	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
ALPHA-CHLORDANE							
AROCLOR-1016							
AROCLOR-1221							
AROCLOR-1232							
AROCLOR-1242							
AROCLOR-1248							
AROCLOR-1254							
AROCLOR-1260							
BETA-BHC							
DELTA-BHC							
DIELDRIN							
ENDOSULFAN I							
ENDOSULFAN II							
ENDOSULFAN SULFATE							
ENDRIN							
ENDRIN ALDEHYDE							
ENDRIN KETONE							
GAMMA-BHC (LINDANE)							
GAMMA-CHLORDANE							
HEPTACHLOR							
HEPTACHLOR EPOXIDE							
METHOXYCHLOR							
TOXAPHENE							
Explosives (ug/kg)							
1,3-DINITROBENZENE							
2,4,6-TRINITROTOLUENE							
2,4-DINITROTOLUENE							
2,6-DINITROTOLUENE							
2-AMINO-4,6-DINITROTOLUENE							

Round	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57SB003	S57SB003	S57SB003
Sample ID	S57SB0020401	S57SB0020501	S57SB0020601	S57SB0020601-D	S57SB0030101	S57SB0030101-D	S57SB0030201
Depth Range	6 - 8	24 - 25	18 - 20	18 - 20	3 - 4	3 - 4	4 - 6
Sample Date	1/7/1999	1/7/1999	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
2-NITROTOLUENE							
3-NITROTOLUENE							
4-AMINO-2,6-DINITROTOLUENE							
4-NITROTOLUENE							
HMX							
NITROBENZENE							
NITROCELLULOSE							
NITROGLYCERIN							
NITROGUANIDINE							
RDX							
TETRYL							
Inorganics (mg/kg)							
ALUMINUM							
ANTIMONY							
ARSENIC							
BARIUM							
BERYLLIUM							
CADMIUM							
CALCIUM							
CHROMIUM							
COBALT							
COPPER							
IRON							
LEAD							
MAGNESIUM							
MANGANESE							
MERCURY							
NICKEL							
POTASSIUM							

Round	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57MW003-SB002	S57SB003	S57SB003	S57SB003
Sample ID	S57SB0020401	S57SB0020501	S57SB0020601	S57SB0020601-D	S57SB0030101	S57SB0030101-D	S57SB0030201
Depth Range	6 - 8	24 - 25	18 - 20	18 - 20	3 - 4	3 - 4	4 - 6
Sample Date	1/7/1999	1/7/1999	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
SELENIUM							
SILVER							
SODIUM							
THALLIUM							
VANADIUM							
ZINC							
Miscellaneous Parameters							
CATION EXCHANGE CAPACITY (MEQ/1)							
PH (MEQ/1)							
PH (S.U.)							
TOTAL ORGANIC CARBON (MG/KG)	10200 L	4110 UR	6790 J	1630 UJ			
TOTAL SOLIDS (%)							
Field Parameters							
BULK DENSITY (PCF)							
POROSITY (%)							
SIEVE 1" (%)							
SIEVE 1-1/2" (%)							
SIEVE 1/2" (%)							
SIEVE 3/4" (%)							
SIEVE 3/8" (%)							
SIEVE NO. 004 (%)							
SIEVE NO. 010 (%)							
SIEVE NO. 020 (%)							
SIEVE NO. 040 (%)							
SIEVE NO. 100 (%)							
SIEVE NO. 200 (%)							
SPECIFIC GRAVITY (S.U.)							

Round	1998Q4	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1
Location	S57SB003	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW009-SB005
Sample ID	S57SB0030201-D	S57SS0040101	S57SB0040101	S57SB0040201	S57SB0040301	S57SB0040301-D	S57SS0050101
Depth Range	4 - 6	0 - 0.5	6 - 8	4 - 5	14 - 16	14 - 16	0 - 0.5
Sample Date	10/7/1998	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/12/1999
Volatile Organics (ug/kg)							
1,1,1-TRICHLOROETHANE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
1,1,2,2-TETRACHLOROETHANE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
1,1,2-TRICHLOROETHANE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
1,1,2-TRICHLOROTRIFLUOROETHANE							
1,1-DICHLOROETHANE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
1,1-DICHLOROETHENE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
1,2-DICHLOROETHANE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
1,2-DICHLOROPROPANE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
2-BUTANONE	12 UJ	11 U	12 U	12 U	13 U	14 U	11 U
2-HEXANONE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
4-METHYL-2-PENTANONE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
ACETONE	12 U	11 U	100	20 J	21 J	14 U	11 U
BENZENE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
BROMODICHLOROMETHANE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
BROMOFORM	12 U	11 U	12 U	12 U	13 U	14 U	11 U
BROMOMETHANE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
CARBON DISULFIDE	12 U	11 U	4 J	1 J	13 U	14 U	11 U
CARBON TETRACHLORIDE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
CHLOROBENZENE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
CHLORODIBROMOMETHANE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
CHLOROETHANE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
CHLOROFORM	12 U	11 U	12 U	12 U	13 U	14 U	11 U
CHLOROMETHANE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
CIS-1,2-DICHLOROETHENE	12 U	2 J	12 U	12 U	13 U	14 U	11 U
CIS-1,3-DICHLOROPROPENE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
CYCLOHEXANE							
DIETHYL ETHER	12 UJ	11 U	12 U	12 U	80 J	120 J	11 U
ETHYLBENZENE	12 U	11 U	12 U	12 U	13 U	14 U	11 U

Round	1998Q4	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1
Location	S57SB003	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW009-SB005
Sample ID	S57SB0030201-D	S57SS0040101	S57SB0040101	S57SB0040201	S57SB0040301	S57SB0040301-D	S57SS0050101
Depth Range	4 - 6	0 - 0.5	6 - 8	4 - 5	14 - 16	14 - 16	0 - 0.5
Sample Date	10/7/1998	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/12/1999
ISOPROPYLBENZENE							
M+P-XYLENES							
METHYL ACETATE							
METHYL CYCLOHEXANE							
METHYL TERT-BUTYL ETHER							
METHYLENE CHLORIDE	45 B	8 B	8 B	8 B	8 B	7 B	4 B
O-XYLENE							
STYRENE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
TETRACHLOROETHENE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
TOLUENE	12 U	1 J	12 U	12 U	13 U	14 U	11 U
TOTAL XYLENES	12 U	11 U	12 U	12 U	13 U	14 U	11 U
TRANS-1,2-DICHLOROETHENE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
TRANS-1,3-DICHLOROPROPENE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
TRICHLOROETHENE	12 U	10 J	2 J	1 J	1 J	14 U	11 U
VINYL CHLORIDE	12 U	11 U	12 U	12 U	13 U	14 U	11 U
Semivolatile Organics (ug/kg)							
1,2,4-TRICHLOROBENZENE							370 U
1,2-DICHLOROBENZENE							370 U
1,3,5-TRINITROBENZENE							250 U
1,3-DICHLOROBENZENE							370 U
1,4-DICHLOROBENZENE							370 U
2,2'-OXYBIS(1-CHLOROPROPANE)							370 U
2,4,5-TRICHLOROPHENOL							930 U
2,4,6-TRICHLOROPHENOL							370 U
2,4-DICHLOROPHENOL							370 U
2,4-DIMETHYLPHENOL							370 U
2,4-DINITROPHENOL							930 U
2,4-DINITROTOLUENE							370 U
2,6-DINITROTOLUENE							370 U

Round	1998Q4	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1
Location	S57SB003	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW009-SB005
Sample ID	S57SB0030201-D	S57SS0040101	S57SB0040101	S57SB0040201	S57SB0040301	S57SB0040301-D	S57SS0050101
Depth Range	4 - 6	0 - 0.5	6 - 8	4 - 5	14 - 16	14 - 16	0 - 0.5
Sample Date	10/7/1998	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/12/1999
2-CHLORONAPHTHALENE							370 U
2-CHLOROPHENOL							370 U
2-METHYLNAPHTHALENE							37 J
2-METHYLPHENOL							370 U
2-NITROANILINE							930 U
2-NITROPHENOL							370 U
3,3'-DICHLOROBENZIDINE							370 U
3-NITROANILINE							930 U
4,6-DINITRO-2-METHYLPHENOL							930 U
4-BROMOPHENYL PHENYL ETHER							370 U
4-CHLORO-3-METHYLPHENOL							370 U
4-CHLOROANILINE							370 U
4-CHLOROPHENYL PHENYL ETHER							370 U
4-METHYLPHENOL							370 U
4-NITROANILINE							930 U
4-NITROPHENOL							930 U
ACENAPHTHENE							370 U
ACENAPHTHYLENE							140 J
ANTHRACENE							240 J
BENZO(A)ANTHRACENE							2300
BENZO(A)PYRENE							1700
BENZO(B)FLUORANTHENE							4200
BENZO(G,H,I)PERYLENE							450
BENZO(K)FLUORANTHENE							1400
BIS(2-CHLOROETHOXY)METHANE							370 U
BIS(2-CHLOROETHYL)ETHER							370 U
BIS(2-ETHYLHEXYL)PHTHALATE							120 J
BUTYL BENZYL PHTHALATE							370 U
CARBAZOLE							99 J

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1998Q4	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1
Location	S57SB003	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW009-SB005
Sample ID	S57SB0030201-D	S57SS0040101	S57SB0040101	S57SB0040201	S57SB0040301	S57SB0040301-D	S57SS0050101
Depth Range	4 - 6	0 - 0.5	6 - 8	4 - 5	14 - 16	14 - 16	0 - 0.5
Sample Date	10/7/1998	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/12/1999
CHRYSENE							2200
DI-N-BUTYL PHTHALATE							370 U
DI-N-OCTYL PHTHALATE							370 U
DIBENZO(A,H)ANTHRACENE							350 J
DIBENZOFURAN							370 U
DIETHYL PHTHALATE							370 U
DIMETHYL PHTHALATE							370 U
FLUORANTHENE							1800
FLUORENE							39 J
HEXACHLOROBENZENE							370 U
HEXACHLOROBUTADIENE							370 U
HEXACHLOROCYCLOPENTADIENE							370 U
HEXACHLOROETHANE							370 U
INDENO(1,2,3-CD)PYRENE							970
ISOPHORONE							370 U
N-NITROSO-DI-N-PROPYLAMINE							370 U
N-NITROSODIPHENYLAMINE							370 U
NAPHTHALENE							38 J
NITROBENZENE							370 U
PENTACHLOROPHENOL							930 U
PHENANTHRENE							490
PHENOL							370 U
PYRENE							2500
Pesticides/PCBs (ug/kg)							
4,4'-DDD							12
4,4'-DDE							61
4,4'-DDT							150 J
ALDRIN							1.9 U
ALPHA-BHC							1.9 U

Round	1998Q4	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1
Location	S57SB003	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW009-SB005
Sample ID	S57SB0030201-D	S57SS0040101	S57SB0040101	S57SB0040201	S57SB0040301	S57SB0040301-D	S57SS0050101
Depth Range	4 - 6	0 - 0.5	6 - 8	4 - 5	14 - 16	14 - 16	0 - 0.5
Sample Date	10/7/1998	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/12/1999
ALPHA-CHLORDANE							1.9 U
AROCLOR-1016							38 U
AROCLOR-1221							75 U
AROCLOR-1232							38 U
AROCLOR-1242							38 U
AROCLOR-1248							38 U
AROCLOR-1254							38 U
AROCLOR-1260							38 U
BETA-BHC							1.9 U
DELTA-BHC							1.9 U
DIELDRIN							3.8 U
ENDOSULFAN I							1.9 U
ENDOSULFAN II							3.8 U
ENDOSULFAN SULFATE							3.8 U
ENDRIN							3.8 U
ENDRIN ALDEHYDE							3.8 U
ENDRIN KETONE							3.8 U
GAMMA-BHC (LINDANE)							1.9 U
GAMMA-CHLORDANE							5.3 J
HEPTACHLOR							1.9 U
HEPTACHLOR EPOXIDE							1.9 U
METHOXYCHLOR							19 U
TOXAPHENE							190 U
Explosives (ug/kg)							
1,3-DINITROBENZENE							250 U
2,4,6-TRINITROTOLUENE							250 U
2,4-DINITROTOLUENE							250 U
2,6-DINITROTOLUENE							250 U
2-AMINO-4,6-DINITROTOLUENE							250 U

Round	1998Q4	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1
Location	S57SB003	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW009-SB005
Sample ID	S57SB0030201-D	S57SS0040101	S57SB0040101	S57SB0040201	S57SB0040301	S57SB0040301-D	S57SS0050101
Depth Range	4 - 6	0 - 0.5	6 - 8	4 - 5	14 - 16	14 - 16	0 - 0.5
Sample Date	10/7/1998	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/12/1999
2-NITROTOLUENE							500 U
3-NITROTOLUENE							500 U
4-AMINO-2,6-DINITROTOLUENE							250 U
4-NITROTOLUENE							500 U
HMX							500 U
NITROBENZENE							250 U
NITROCELLULOSE							299000 L
NITROGLYCERIN							5000 U
NITROGUANIDINE							0.51 U
RDX							500 U
TETRYL							500 U
Inorganics (mg/kg)							
ALUMINUM							3640 J
ANTIMONY							0.88 B
ARSENIC							33.7
BARIUM							20.7
BERYLLIUM							0.29
CADMIUM							0.47
CALCIUM							604
CHROMIUM							13.1 J
COBALT							8.1
COPPER							10.4
IRON							12400
LEAD							487 J
MAGNESIUM							301
MANGANESE							134 K
MERCURY							0.09
NICKEL							6.0
POTASSIUM							234

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1998Q4	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1
Location	S57SB003	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW007-SB004	S57MW009-SB005
Sample ID	S57SB0030201-D	S57SS0040101	S57SB0040101	S57SB0040201	S57SB0040301	S57SB0040301-D	S57SS0050101
Depth Range	4 - 6	0 - 0.5	6 - 8	4 - 5	14 - 16	14 - 16	0 - 0.5
Sample Date	10/7/1998	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/10/1999	1/12/1999
SELENIUM							0.56 L
SILVER							0.11 U
SODIUM							128 B
THALLIUM							0.50 UL
VANADIUM							19.1
ZINC							69.8
Miscellaneous Parameters							
CATION EXCHANGE CAPACITY (MEQ/1)							
PH (MEQ/1)							
PH (S.U.)							6.06
TOTAL ORGANIC CARBON (MG/KG)					5180 U	10900 U	
TOTAL SOLIDS (%)							
Field Parameters							
BULK DENSITY (PCF)							
POROSITY (%)							
SIEVE 1" (%)							
SIEVE 1-1/2" (%)							
SIEVE 1/2" (%)							
SIEVE 3/4" (%)							
SIEVE 3/8" (%)							
SIEVE NO. 004 (%)							
SIEVE NO. 010 (%)							
SIEVE NO. 020 (%)							
SIEVE NO. 040 (%)							
SIEVE NO. 100 (%)							
SIEVE NO. 200 (%)							
SPECIFIC GRAVITY (S.U.)							

Round	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57SB006
Sample ID	S57SB0050101	S57SB0050201	S57SB0050201-D	S57SB0050301	S57SB0050401	S57SB0050501	S57SB0060101
Depth Range	2 - 4	4 - 6	4 - 6	16 - 18	3 - 5	18 - 20	3 - 4
Sample Date	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	10/8/1998
Volatile Organics (ug/kg)							
1,1,1-TRICHLOROETHANE	12 U	12 U		13 U			12 UJ
1,1,2,2-TETRACHLOROETHANE	12 U	12 U		13 U			12 UJ
1,1,2-TRICHLOROETHANE	12 U	12 U		13 U			12 UJ
1,1,2-TRICHLOROTRIFLUOROETHANE							
1,1-DICHLOROETHANE	12 U	12 U		13 U			12 UJ
1,1-DICHLOROETHENE	12 U	12 U		13 U			12 UJ
1,2-DICHLOROETHANE	12 U	12 U		13 U			12 UJ
1,2-DICHLOROPROPANE	12 U	12 U		13 U			12 UJ
2-BUTANONE	12 U	12 U		13 U			12 UJ
2-HEXANONE	12 U	12 U		13 U			12 UJ
4-METHYL-2-PENTANONE	12 U	12 U		13 U			12 UJ
ACETONE	12 U	2200 J		13 U			12 UJ
BENZENE	12 U	12 U		13 U			12 UJ
BROMODICHLOROMETHANE	12 U	12 U		13 U			12 UJ
BROMOFORM	12 U	12 U		13 U			12 UJ
BROMOMETHANE	12 U	12 U		13 U			12 UJ
CARBON DISULFIDE	12 U	12 U		13 U			12 UJ
CARBON TETRACHLORIDE	12 U	12 U		13 U			12 UJ
CHLOROBENZENE	12 U	12 U		13 U			12 UJ
CHLORODIBROMOMETHANE	12 U	12 U		13 U			12 UJ
CHLOROETHANE	12 U	12 U		13 U			12 UJ
CHLOROFORM	12 U	12 U		13 U			12 UJ
CHLOROMETHANE	12 U	12 U		13 U			12 UJ
CIS-1,2-DICHLOROETHENE	12 U	12 U		13 U			77000
CIS-1,3-DICHLOROPROPENE	12 U	12 U		13 U			12 UJ
CYCLOHEXANE							
DIETHYL ETHER	12 U	12 U		13 U			12 UJ
ETHYLBENZENE	12 U	12 U		13 U			12 UJ

Round	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57SB006
Sample ID	S57SB0050101	S57SB0050201	S57SB0050201-D	S57SB0050301	S57SB0050401	S57SB0050501	S57SB0060101
Depth Range	2 - 4	4 - 6	4 - 6	16 - 18	3 - 5	18 - 20	3 - 4
Sample Date	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	10/8/1998
ISOPROPYLBENZENE							
M+P-XYLENES							
METHYL ACETATE							
METHYL CYCLOHEXANE							
METHYL TERT-BUTYL ETHER							
METHYLENE CHLORIDE	6 B	5 B		6 B			21000
O-XYLENE							
STYRENE	12 U	12 U		13 U			12 UJ
TETRACHLOROETHENE	12 U	12 U		13 U			12 UJ
TOLUENE	12 U	12 U		13 U			4 J
TOTAL XYLENES	12 U	12 U		13 U			8 J
TRANS-1,2-DICHLOROETHENE	12 U	12 U		13 U			4 J
TRANS-1,3-DICHLOROPROPENE	12 U	12 U		13 U			12 UJ
TRICHLOROETHENE	12 U	12 U		7 J			220000
VINYL CHLORIDE	12 U	12 U		13 U			12 UJ
Semivolatile Organics (ug/kg)							
1,2,4-TRICHLOROBENZENE	390 U	400 U	400 U	430 U			
1,2-DICHLOROBENZENE	390 U	400 U	400 U	430 U			
1,3,5-TRINITROBENZENE	250 U	250 U	250 U	250 U			
1,3-DICHLOROBENZENE	390 U	400 U	400 U	430 U			
1,4-DICHLOROBENZENE	390 U	400 U	400 U	430 U			
2,2'-OXYBIS(1-CHLOROPROPANE)	390 U	400 U	400 U	430 U			
2,4,5-TRICHLOROPHENOL	970 U	1000 U	1000 U	1100 U			
2,4,6-TRICHLOROPHENOL	390 U	400 U	400 U	430 U			
2,4-DICHLOROPHENOL	390 U	400 U	400 U	430 U			
2,4-DIMETHYLPHENOL	390 U	400 U	400 U	430 U			
2,4-DINITROPHENOL	970 U	1000 U	1000 U	1100 U			
2,4-DINITROTOLUENE	390 U	400 U	400 U	430 U			
2,6-DINITROTOLUENE	390 U	400 U	400 U	430 U			

Round	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57SB006
Sample ID	S57SB0050101	S57SB0050201	S57SB0050201-D	S57SB0050301	S57SB0050401	S57SB0050501	S57SB0060101
Depth Range	2 - 4	4 - 6	4 - 6	16 - 18	3 - 5	18 - 20	3 - 4
Sample Date	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	10/8/1998
2-CHLORONAPHTHALENE	390 U	400 U	400 U	430 U			
2-CHLOROPHENOL	390 U	400 U	400 U	430 U			
2-METHYLNAPHTHALENE	390 U	400 U	400 U	430 U			
2-METHYLPHENOL	390 U	400 U	400 U	430 U			
2-NITROANILINE	970 U	1000 U	1000 U	1100 U			
2-NITROPHENOL	390 U	400 U	400 U	430 U			
3,3'-DICHLOROBENZIDINE	390 U	400 U	400 U	430 U			
3-NITROANILINE	970 U	1000 U	1000 U	1100 U			
4,6-DINITRO-2-METHYLPHENOL	970 U	1000 U	1000 U	1100 U			
4-BROMOPHENYL PHENYL ETHER	390 U	400 U	400 U	430 U			
4-CHLORO-3-METHYLPHENOL	390 U	400 U	400 U	430 U			
4-CHLOROANILINE	390 U	400 U	400 U	430 U			
4-CHLOROPHENYL PHENYL ETHER	390 U	400 U	400 U	430 U			
4-METHYLPHENOL	390 U	400 U	400 U	430 U			
4-NITROANILINE	970 U	1000 U	1000 U	1100 U			
4-NITROPHENOL	970 U	1000 U	1000 U	1100 U			
ACENAPHTHENE	390 U	400 U	400 U	430 U			
ACENAPHTHYLENE	390 U	400 U	400 U	430 U			
ANTHRACENE	390 U	400 U	400 U	430 U			
BENZO(A)ANTHRACENE	360 J	400 U	85 J	430 U			
BENZO(A)PYRENE	270 J	400 U	61 J	430 U			
BENZO(B)FLUORANTHENE	510	400 U	85 J	430 U			
BENZO(G,H,I)PERYLENE	70 J	400 U	400 U	430 U			
BENZO(K)FLUORANTHENE	200 J	400 U	400 U	430 U			
BIS(2-CHLOROETHOXY)METHANE	390 U	400 U	400 U	430 U			
BIS(2-CHLOROETHYL)ETHER	390 U	400 U	400 U	430 U			
BIS(2-ETHYLHEXYL)PHTHALATE	92 J	400 U	400 U	430 U			
BUTYL BENZYL PHTHALATE	390 U	400 U	400 U	430 U			
CARBAZOLE	390 U	400 U	400 U	430 U			

Round	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57SB006
Sample ID	S57SB0050101	S57SB0050201	S57SB0050201-D	S57SB0050301	S57SB0050401	S57SB0050501	S57SB0060101
Depth Range	2 - 4	4 - 6	4 - 6	16 - 18	3 - 5	18 - 20	3 - 4
Sample Date	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	10/8/1998
CHRYSENE	350 J	400 U	76 J	430 U			
DI-N-BUTYL PHTHALATE	390 U	400 U	400 U	430 U			
DI-N-OCTYL PHTHALATE	390 U	400 U	400 U	430 U			
DIBENZO(A,H)ANTHRACENE	60 J	400 U	400 U	430 U			
DIBENZOFURAN	390 U	400 U	400 U	430 U			
DIETHYL PHTHALATE	390 U	400 U	400 U	430 U			
DIMETHYL PHTHALATE	390 U	400 U	400 U	430 U			
FLUORANTHENE	380 J	400 U	140 J	430 U			
FLUORENE	390 U	400 U	400 U	430 U			
HEXACHLOROBENZENE	390 U	400 U	400 U	430 U			
HEXACHLOROBUTADIENE	390 U	400 U	400 U	430 U			
HEXACHLOROCYCLOPENTADIENE	390 U	400 U	400 U	430 U			
HEXACHLOROETHANE	390 U	400 U	400 U	430 U			
INDENO(1,2,3-CD)PYRENE	160 J	400 U	43 J	430 U			
ISOPHORONE	390 U	400 U	400 U	430 U			
N-NITROSO-DI-N-PROPYLAMINE	390 U	400 U	400 U	430 U			
N-NITROSODIPHENYLAMINE	390 U	400 U	400 U	430 U			
NAPHTHALENE	390 U	400 U	400 U	430 U			
NITROBENZENE	390 U	400 U	400 U	430 U			
PENTACHLOROPHENOL	970 U	1000 U	1000 U	1100 U			
PHENANTHRENE	110 J	400 U	110 J	430 U			
PHENOL	390 U	400 U	400 U	430 U			
PYRENE	380 J	400 U	140 J	430 U			
Pesticides/PCBs (ug/kg)							
4,4'-DDD	3.9 U	4.0 U	4.0 U	4.3 U			
4,4'-DDE	17	4.0 U	4.0 U	4.3 U			
4,4'-DDT	20	4.0 U	4.0 U	4.3 U			
ALDRIN	1.9 U	2.0 U	2.0 U	2.1 U			
ALPHA-BHC	1.9 U	2.0 U	2.0 U	2.1 U			

Round	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57SB006
Sample ID	S57SB0050101	S57SB0050201	S57SB0050201-D	S57SB0050301	S57SB0050401	S57SB0050501	S57SB0060101
Depth Range	2 - 4	4 - 6	4 - 6	16 - 18	3 - 5	18 - 20	3 - 4
Sample Date	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	10/8/1998
ALPHA-CHLORDANE	1.9 U	2.0 U	2.0 U	2.1 U			
AROCLOR-1016	39 U	40 U	40 U	43 U			
AROCLOR-1221	77 U	81 U	80 U	86 U			
AROCLOR-1232	39 U	40 U	40 U	43 U			
AROCLOR-1242	39 U	40 U	40 U	43 U			
AROCLOR-1248	39 U	40 U	40 U	43 U			
AROCLOR-1254	39 U	40 U	40 U	43 U			
AROCLOR-1260	39 U	40 U	40 U	43 U			
BETA-BHC	1.9 U	2.0 U	2.0 U	2.1 U			
DELTA-BHC	1.9 U	2.0 U	2.0 U	2.1 U			
DIELDRIN	3.9 U	4.0 U	4.0 U	4.3 U			
ENDOSULFAN I	1.9 U	2.0 U	2.0 U	2.1 U			
ENDOSULFAN II	3.9 U	4.0 U	4.0 U	4.3 U			
ENDOSULFAN SULFATE	3.9 U	4.0 U	4.0 U	4.3 U			
ENDRIN	3.9 U	4.0 U	4.0 U	4.3 U			
ENDRIN ALDEHYDE	3.9 U	4.0 U	4.0 U	4.3 U			
ENDRIN KETONE	3.9 U	4.0 U	4.0 U	4.3 U			
GAMMA-BHC (LINDANE)	1.9 U	2.0 U	2.0 U	2.1 U			
GAMMA-CHLORDANE	1.9 U	2.0 U	2.0 U	2.1 U			
HEPTACHLOR	1.9 U	2.0 U	2.0 U	2.1 U			
HEPTACHLOR EPOXIDE	1.9 U	2.0 U	2.0 U	2.1 U			
METHOXYCHLOR	19 U	20 U	20 U	21 U			
TOXAPHENE	190 U	200 U	200 U	210 U			
Explosives (ug/kg)							
1,3-DINITROBENZENE	250 U	250 U	250 U	250 U			
2,4,6-TRINITROTOLUENE	250 U	250 U	250 U	250 U			
2,4-DINITROTOLUENE	250 U	250 U	250 U	250 U			
2,6-DINITROTOLUENE	250 U	250 U	250 U	250 U			
2-AMINO-4,6-DINITROTOLUENE	250 U	250 U	250 U	250 U			

Round	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57SB006
Sample ID	S57SB0050101	S57SB0050201	S57SB0050201-D	S57SB0050301	S57SB0050401	S57SB0050501	S57SB0060101
Depth Range	2 - 4	4 - 6	4 - 6	16 - 18	3 - 5	18 - 20	3 - 4
Sample Date	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	10/8/1998
2-NITROTOLUENE	500 U	500 U	500 U	500 U			
3-NITROTOLUENE	500 U	500 U	500 U	500 U			
4-AMINO-2,6-DINITROTOLUENE	250 U	250 U	250 U	250 U			
4-NITROTOLUENE	500 U	500 U	500 U	500 U			
HMX	500 U	500 U	500 U	500 U			
NITROBENZENE	250 U	250 U	250 U	250 U			
NITROCELLULOSE	95100 L	53900 L	123000 L	64900 L			
NITROGLYCERIN	5000 U	5000 U	5000 U	5000 U			
NITROGUANIDINE	0.51 U	0.51 U	0.51 U	0.5 U			
RDX	500 U	500 U	500 U	500 U			
TETRYL	500 U	500 U	500 U	500 U			
Inorganics (mg/kg)							
ALUMINUM	8060 J	10200 J	8260 J	2030 J			
ANTIMONY	0.48 B	0.56 UL	0.57 B	0.59 B			
ARSENIC	21.3	17.4	50.0	2.9 L			
BARIUM	24.7	27.9	39.8	19.1			
BERYLLIUM	0.32	0.45	0.33	0.31			
CADMIUM	0.27 B	0.20 B	0.19 B	0.14 B			
CALCIUM	914	415	328	494			
CHROMIUM	12.5 J	14.1 J	12.9 J	5.6 J			
COBALT	3.1	3.2	2.7	9.2			
COPPER	9.5	9.1	8.9	5.8			
IRON	16000	17600	15600	7360			
LEAD	18.6 J	100 J	54.9 J	3.9 J			
MAGNESIUM	314	463	368	352			
MANGANESE	89.3 K	59.8 K	48.7 K	98.1 K			
MERCURY	0.25	0.07	0.10	0.02 U			
NICKEL	4.4	3.9	3.8	2.0			
POTASSIUM	334	504	470	360			

Round	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57MW009-SB005	S57SB006
Sample ID	S57SB0050101	S57SB0050201	S57SB0050201-D	S57SB0050301	S57SB0050401	S57SB0050501	S57SB0060101
Depth Range	2 - 4	4 - 6	4 - 6	16 - 18	3 - 5	18 - 20	3 - 4
Sample Date	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	1/12/1999	10/8/1998
SELENIUM	0.59 L	0.70 L	0.69 L	0.55 UL			
SILVER	0.10 U	0.15 U	0.15 U	0.16 U			
SODIUM	231 B	133 B	170 B	77.0 B			
THALLIUM	0.47 UL	0.71 UL	0.69 UL	0.73 UL			
VANADIUM	22.1	30.4	27.1	12.7			
ZINC	35.1	52.0	42.2	20.0			
Miscellaneous Parameters							
CATION EXCHANGE CAPACITY (MEQ/1)							
PH (MEQ/1)							
PH (S.U.)	7.10	5.35	5.40	5.22			
TOTAL ORGANIC CARBON (MG/KG)	22000	12600		10300 U			
TOTAL SOLIDS (%)							
Field Parameters							
BULK DENSITY (PCF)							
POROSITY (%)							
SIEVE 1" (%)							
SIEVE 1-1/2" (%)							
SIEVE 1/2" (%)							
SIEVE 3/4" (%)							
SIEVE 3/8" (%)							
SIEVE NO. 004 (%)							
SIEVE NO. 010 (%)							
SIEVE NO. 020 (%)							
SIEVE NO. 040 (%)							
SIEVE NO. 100 (%)							
SIEVE NO. 200 (%)							
SPECIFIC GRAVITY (S.U.)							

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4
Location	S57SB006	S57SB007	S57SB007	S57SB007	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008
Sample ID	S57SB0060201	S57SS0070101	S57SB0070101	S57SB0070201	S57SS0080101	S57SS0080101-D	S57SB0080101	S57SB0080101-D
Depth Range	10 - 11	0 - 0.5	4 - 5	6 - 8	0 - 0.5	0 - 0.5	4 - 6	4 - 6
Sample Date	10/8/1998	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	10/8/1998
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
1,1,2,2-TETRACHLOROETHANE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
1,1,2-TRICHLOROETHANE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
1,1,2-TRICHLOROTRIFLUOROETHANE								
1,1-DICHLOROETHANE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
1,1-DICHLOROETHENE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
1,2-DICHLOROETHANE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
1,2-DICHLOROPROPANE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
2-BUTANONE	11 UJ	14 UJ	13 UJ	11 UJ	11 UJ	11 UJ	12 UJ	
2-HEXANONE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
4-METHYL-2-PENTANONE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
ACETONE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
BENZENE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
BROMODICHLOROMETHANE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
BROMOFORM	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
BROMOMETHANE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
CARBON DISULFIDE	2 J	14 U	13 U	11 U	11 U	11 U	12 U	
CARBON TETRACHLORIDE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
CHLOROBENZENE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
CHLORODIBROMOMETHANE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
CHLOROETHANE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
CHLOROFORM	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
CHLOROMETHANE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
CIS-1,2-DICHLOROETHENE	11 U	4 J	11 J	11 U	11 U	11 U	12 U	
CIS-1,3-DICHLOROPROPENE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
CYCLOHEXANE								
DIETHYL ETHER	11 U	14 U	13 U	11 U	11 UJ	11 U	12 UJ	
ETHYLBENZENE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4
Location	S57SB006	S57SB007	S57SB007	S57SB007	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008
Sample ID	S57SB0060201	S57SS0070101	S57SB0070101	S57SB0070201	S57SS0080101	S57SS0080101-D	S57SB0080101	S57SB0080101-D
Depth Range	10 - 11	0 - 0.5	4 - 5	6 - 8	0 - 0.5	0 - 0.5	4 - 6	4 - 6
Sample Date	10/8/1998	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	10/8/1998
ISOPROPYLBENZENE								
M+P-XYLENES								
METHYL ACETATE								
METHYL CYCLOHEXANE								
METHYL TERT-BUTYL ETHER								
METHYLENE CHLORIDE	11 B	27 B	13 B	12 B	44 B	22 B	44 B	
O-XYLENE								
STYRENE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
TETRACHLOROETHENE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
TOLUENE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
TOTAL XYLENES	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
TRANS-1,2-DICHLOROETHENE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
TRANS-1,3-DICHLOROPROPENE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
TRICHLOROETHENE	4 J	93	50	13	64	34	48	
VINYL CHLORIDE	11 U	14 U	13 U	11 U	11 U	11 U	12 U	
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE		480 U	420 U	420 U	380 U	370 U	390 U	
1,2-DICHLOROBENZENE		480 U	420 U	420 U	380 U	370 U	390 U	
1,3,5-TRINITROBENZENE		250 U	250 U	250 U	250 U	250 U	250 U	
1,3-DICHLOROBENZENE		480 U	420 U	420 U	380 U	370 U	390 U	
1,4-DICHLOROBENZENE		480 U	420 U	420 U	380 U	370 U	390 U	
2,2'-OXYBIS(1-CHLOROPROPANE)		480 U	420 U	420 U	380 U	370 U	390 U	
2,4,5-TRICHLOROPHENOL		1200 U	1100 U	1100 U	950 U	940 U	970 U	
2,4,6-TRICHLOROPHENOL		480 U	420 U	420 U	380 U	370 U	390 U	
2,4-DICHLOROPHENOL		480 U	420 U	420 U	380 U	370 U	390 U	
2,4-DIMETHYLPHENOL		480 U	420 U	420 U	380 U	370 U	390 U	
2,4-DINITROPHENOL		1200 UJ	1100 UJ	1100 UJ	950 UJ	940 UJ	970 UJ	
2,4-DINITROTOLUENE		480 U	420 U	420 U	380 U	370 U	390 U	
2,6-DINITROTOLUENE		480 U	420 U	420 U	380 U	370 U	390 U	

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4
Location	S57SB006	S57SB007	S57SB007	S57SB007	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008
Sample ID	S57SB0060201	S57SS0070101	S57SB0070101	S57SB0070201	S57SS0080101	S57SS0080101-D	S57SB0080101	S57SB0080101-D
Depth Range	10 - 11	0 - 0.5	4 - 5	6 - 8	0 - 0.5	0 - 0.5	4 - 6	4 - 6
Sample Date	10/8/1998	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	10/8/1998
2-CHLORONAPHTHALENE		480 U	420 U	420 U	380 U	370 U	390 U	
2-CHLOROPHENOL		480 U	420 U	420 U	380 U	370 U	390 U	
2-METHYLNAPHTHALENE		480 U	420 U	420 U	380 U	370 U	390 U	
2-METHYLPHENOL		480 U	420 U	420 U	380 U	370 U	390 U	
2-NITROANILINE		1200 U	1100 U	1100 U	950 U	940 U	970 U	
2-NITROPHENOL		480 U	420 U	420 U	380 U	370 U	390 U	
3,3'-DICHLOROBENZIDINE		480 U	420 U	420 U	380 U	370 U	390 U	
3-NITROANILINE		1200 UJ	1100 UJ	1100 UJ	950 UJ	940 UJ	970 UJ	
4,6-DINITRO-2-METHYLPHENOL		1200 U	1100 U	1100 U	950 U	940 U	970 U	
4-BROMOPHENYL PHENYL ETHER		480 U	420 U	420 U	380 U	370 U	390 U	
4-CHLORO-3-METHYLPHENOL		480 U	420 U	420 U	380 U	370 U	390 U	
4-CHLOROANILINE		480 U	420 U	420 U	380 U	370 U	390 U	
4-CHLOROPHENYL PHENYL ETHER		480 U	420 U	420 U	380 U	370 U	390 U	
4-METHYLPHENOL		480 U	420 U	420 U	380 U	370 U	390 U	
4-NITROANILINE		1200 U	1100 U	1100 U	950 U	940 U	970 U	
4-NITROPHENOL		1200 U	1100 U	1100 U	950 U	940 U	970 U	
ACENAPHTHENE		480 U	420 U	420 U	380 U	370 U	390 U	
ACENAPHTHYLENE		480 U	420 U	420 U	380 U	370 U	390 U	
ANTHRACENE		51 J	420 U	420 U	380 U	370 U	390 U	
BENZO(A)ANTHRACENE		200 J	420 U	160 J	150 J	370 U	390 U	
BENZO(A)PYRENE		130 J	420 U	120 J	150 J	370 U	390 UJ	
BENZO(B)FLUORANTHENE		200 J	420 U	200 J	280 J	370 U	390 UJ	
BENZO(G,H,I)PERYLENE		61 J	420 U	420 U	52 J	370 U	390 UJ	
BENZO(K)FLUORANTHENE		83 J	420 U	120 J	98 J	370 U	390 UJ	
BIS(2-CHLOROETHOXY)METHANE		480 U	420 U	420 U	380 U	370 U	390 U	
BIS(2-CHLOROETHYL)ETHER		480 U	420 U	420 U	380 U	370 U	390 U	
BIS(2-ETHYLHEXYL)PHTHALATE		480 U	420 U	420 U	41 J	370 U	390 U	
BUTYL BENZYL PHTHALATE		480 U	420 U	420 U	380 U	370 U	390 U	
CARBAZOLE		480 U	420 U	420 U	380 U	370 U	390 U	

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4
Location	S57SB006	S57SB007	S57SB007	S57SB007	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008
Sample ID	S57SB0060201	S57SS0070101	S57SB0070101	S57SB0070201	S57SS0080101	S57SS0080101-D	S57SB0080101	S57SB0080101-D
Depth Range	10 - 11	0 - 0.5	4 - 5	6 - 8	0 - 0.5	0 - 0.5	4 - 6	4 - 6
Sample Date	10/8/1998	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	10/8/1998
CHRYSENE		200 J	420 U	170 J	180 J	370 U	390 U	
DI-N-BUTYL PHTHALATE		480 U	420 U	420 U	380 U	370 U	390 U	
DI-N-OCTYL PHTHALATE		480 U	420 U	420 U	380 U	370 U	390 UJ	
DIBENZO(A,H)ANTHRACENE		480 U	420 U	420 U	380 U	370 U	390 UJ	
DIBENZOFURAN		480 U	420 U	420 U	380 U	370 U	390 U	
DIETHYL PHTHALATE		480 U	420 U	420 U	380 U	370 U	390 U	
DIMETHYL PHTHALATE		480 U	420 U	420 U	380 U	370 U	390 U	
FLUORANTHENE		310 J	420 U	200 J	300 J	370 U	390 U	
FLUORENE		480 U	420 U	420 U	380 U	370 U	390 U	
HEXACHLOROBENZENE		480 U	420 U	420 U	380 U	370 U	390 U	
HEXACHLOROBUTADIENE		480 U	420 U	420 U	380 U	370 U	390 U	
HEXACHLOROCYCLOPENTADIENE		480 UJ	420 UJ	420 UJ	380 UJ	370 UJ	390 UJ	
HEXACHLOROETHANE		480 U	420 U	420 U	380 U	370 U	390 U	
INDENO(1,2,3-CD)PYRENE		79 J	420 U	63 J	79 J	370 U	390 UJ	
ISOPHORONE		480 U	420 U	420 U	380 U	370 U	390 U	
N-NITROSO-DI-N-PROPYLAMINE		480 U	420 U	420 U	380 U	370 U	390 U	
N-NITROSODIPHENYLAMINE		480 U	420 U	420 U	380 U	370 U	390 U	
NAPHTHALENE		480 U	420 U	420 U	380 U	370 U	390 U	
NITROBENZENE		480 U	420 U	420 U	380 U	370 U	390 U	
PENTACHLOROPHENOL		1200 U	1100 U	1100 U	950 U	940 U	970 U	
PHENANTHRENE		310 J	420 U	420 U	180 J	370 U	390 U	
PHENOL		480 U	420 U	420 U	380 U	370 U	390 U	
PYRENE		480	420 U	180 J	310 J	370 U	52 J	
Pesticides/PCBs (ug/kg)								
4,4'-DDD		4.8 U	4.2 U	4.2 U	3.8 U	3.8 U	3.9 U	
4,4'-DDE		4.8 U	4.2 U	4.2 U	3.8 U	3.8 U	3.9 U	
4,4'-DDT		4.8 U	4.2 U	4.2 U	3.8 U	3.8 U	3.9 U	
ALDRIN		2.4 U	2.1 U	2.1 U	1.9 U	1.9 U	1.9 U	
ALPHA-BHC		2.4 U	2.1 U	2.1 U	1.9 U	1.9 U	1.9 U	

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4
Location	S57SB006	S57SB007	S57SB007	S57SB007	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008
Sample ID	S57SB0060201	S57SS0070101	S57SB0070101	S57SB0070201	S57SS0080101	S57SS0080101-D	S57SB0080101	S57SB0080101-D
Depth Range	10 - 11	0 - 0.5	4 - 5	6 - 8	0 - 0.5	0 - 0.5	4 - 6	4 - 6
Sample Date	10/8/1998	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	10/8/1998
ALPHA-CHLORDANE		2.4 U	2.1 U	2.1 U	1.9 U	1.9 U	1.9 U	
AROCLOR-1016		48 U	42 U	42 U	38 U	38 U	39 U	
AROCLOR-1221		96 U	84 U	85 U	76 U	75 U	77 U	
AROCLOR-1232		48 U	42 U	42 U	38 U	38 U	39 U	
AROCLOR-1242		48 U	42 U	42 U	38 U	38 U	39 U	
AROCLOR-1248		48 U	42 U	42 U	38 U	38 U	39 U	
AROCLOR-1254		48 U	42 U	42 U	38 U	38 U	39 U	
AROCLOR-1260		48 U	42 U	42 U	38 U	38 U	39 U	
BETA-BHC		2.4 U	2.1 U	2.1 U	1.9 U	1.9 U	1.9 U	
DELTA-BHC		2.4 U	2.1 U	2.1 U	1.9 U	1.9 U	1.9 U	
DIELDRIN		4.8 U	4.2 U	4.2 U	3.8 U	3.8 U	3.9 U	
ENDOSULFAN I		2.4 U	2.1 U	2.1 U	1.9 U	1.9 U	1.9 U	
ENDOSULFAN II		4.8 U	4.2 U	4.2 U	3.8 U	3.8 U	3.9 U	
ENDOSULFAN SULFATE		4.8 U	4.2 U	4.2 U	3.8 U	3.8 U	3.9 U	
ENDRIN		4.8 U	4.2 U	4.2 U	3.8 U	3.8 U	3.9 U	
ENDRIN ALDEHYDE		4.8 U	4.2 U	4.2 U	3.8 U	3.8 U	3.9 U	
ENDRIN KETONE		4.8 U	4.2 U	4.2 U	3.8 U	3.8 U	3.9 U	
GAMMA-BHC (LINDANE)		2.4 U	2.1 U	2.1 U	1.9 U	1.9 U	1.9 U	
GAMMA-CHLORDANE		2.4 U	2.1 U	2.1 U	1.9 U	1.9 U	1.9 U	
HEPTACHLOR		2.4 U	2.1 U	2.1 U	1.9 U	1.9 U	1.9 U	
HEPTACHLOR EPOXIDE		2.4 U	2.1 U	2.1 U	1.9 U	1.9 U	1.9 U	
METHOXYCHLOR		24 U	21 U	21 U	19 U	19 U	19 U	
TOXAPHENE		240 U	210 U	210 U	190 U	190 U	190 U	
Explosives (ug/kg)								
1,3-DINITROBENZENE		250 U	250 U	250 U	250 U	250 U	250 U	
2,4,6-TRINITROTOLUENE		250 U	250 U	250 U	250 U	250 U	250 U	
2,4-DINITROTOLUENE		250 U	250 U	250 U	250 U	250 U	250 U	
2,6-DINITROTOLUENE		250 U	250 U	250 U	250 U	250 U	250 U	
2-AMINO-4,6-DINITROTOLUENE		250 U	250 U	250 U	250 U	250 U	250 U	

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4
Location	S57SB006	S57SB007	S57SB007	S57SB007	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008
Sample ID	S57SB0060201	S57SS0070101	S57SB0070101	S57SB0070201	S57SS0080101	S57SS0080101-D	S57SB0080101	S57SB0080101-D
Depth Range	10 - 11	0 - 0.5	4 - 5	6 - 8	0 - 0.5	0 - 0.5	4 - 6	4 - 6
Sample Date	10/8/1998	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	10/8/1998
2-NITROTOLUENE		500 U	500 U	500 U	500 U	500 U	500 U	
3-NITROTOLUENE		500 U	500 U	500 U	500 U	500 U	500 U	
4-AMINO-2,6-DINITROTOLUENE		250 U	250 U	250 U	250 U	250 U	250 U	
4-NITROTOLUENE		500 U	500 UJ	500 U	500 U	500 U	500 U	
HMX		500 U	500 U	500 U	500 U	500 U	500 U	
NITROBENZENE		250 U	250 U	250 U	250 U	250 U	250 U	
NITROCELLULOSE		191000	59200	27000 U	116000		37600	66000
NITROGLYCERIN		5000 U	5000 U	5000 U	5000 U	5000 U	5000 U	
NITROGUANIDINE		0.51 U	0.51 U	0.51 U	0.51 U		0.51 U	0.51 U
RDX		500 U	500 U	500 U	500 U	500 U	500 U	
TETRYL		500 UJ	500 UJ	500 UJ	500 UJ	500 UJ	500 UJ	
Inorganics (mg/kg)								
ALUMINUM		9170	11500	13200	6130		4700	5300
ANTIMONY		0.81 B	0.41 B	0.38 UR	0.74 B		0.61 B	0.37 B
ARSENIC		103	36.2	2.6	29.3		9.7	16.2
BARIUM		48.2	58.2	93.5	38.8		25.5	32.3
BERYLLIUM		0.77	2.5	0.95	0.88		0.62	0.63
CADMIUM		0.19 U	0.16 U	0.19 U	0.80		0.13 U	0.15 U
CALCIUM		3270	1650	338	2130		8840	1300
CHROMIUM		14.3	21.0	17.4	12.0		7.3	9.1
COBALT		8.3 K	34.6 K	9.6 K	6.9 K		6.1 K	7.7 K
COPPER		14.7	17.5	10.4	20.3		10.6	11.0
IRON		24800	46300	22100	20500		14000	17200
LEAD		25.4 K	8.6 K	10.9 K	89.2 K		14.2 K	43.6 K
MAGNESIUM		796	1440	1020	682		401	505
MANGANESE		101 J	253 J	76.6 J	97.9 J		101 J	108 J
MERCURY		0.03	0.03	0.02	0.10		0.04	0.04
NICKEL		6.7 K	13.0 K	8.0 K	8.4 K		6.3 K	5.7 K
POTASSIUM		828	1330	796	738		482	586

Round	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4	1998Q4
Location	S57SB006	S57SB007	S57SB007	S57SB007	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008	S57MW011-SB008
Sample ID	S57SB0060201	S57SS0070101	S57SB0070101	S57SB0070201	S57SS0080101	S57SS0080101-D	S57SB0080101	S57SB0080101-D
Depth Range	10 - 11	0 - 0.5	4 - 5	6 - 8	0 - 0.5	0 - 0.5	4 - 6	4 - 6
Sample Date	10/8/1998	10/7/1998	10/7/1998	10/7/1998	10/8/1998	10/8/1998	10/8/1998	10/8/1998
SELENIUM		0.38 UL	0.74 L	0.38 UL	0.32 UL		0.26 UL	0.29 UL
SILVER		0.19 U	0.16 U	0.19 U	0.16 U		0.13 U	0.15 U
SODIUM		45.7	55.1	63.0	82.0		56.8	51.1
THALLIUM		0.58 U	0.47 U	0.57 U	0.48 U		0.39 U	0.44 U
VANADIUM		35.7	60.8	36.4	31.4		16.2	21.8
ZINC		45.0	48.9 K	27.0 K	261		53.8	158
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)								
PH (MEQ/1)								
PH (S.U.)		8.12	6.85	5.75	7.84		8.31	7.47
TOTAL ORGANIC CARBON (MG/KG)								
TOTAL SOLIDS (%)								
Field Parameters								
BULK DENSITY (PCF)								
POROSITY (%)								
SIEVE 1" (%)								
SIEVE 1-1/2" (%)								
SIEVE 1/2" (%)								
SIEVE 3/4" (%)								
SIEVE 3/8" (%)								
SIEVE NO. 004 (%)								
SIEVE NO. 010 (%)								
SIEVE NO. 020 (%)								
SIEVE NO. 040 (%)								
SIEVE NO. 100 (%)								
SIEVE NO. 200 (%)								
SPECIFIC GRAVITY (S.U.)								

Round	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW011-SB008	S57SB009	S57SB009	S57SB009	S57SB009	S57SB010	S57SB010	S57SB011
Sample ID	S57SB0080201	S57SB0090101	S57SB0090201	S57SS0090101	S57SS0090101-D	S57SB0100101	S57SB0100201	S57SS0110101
Depth Range	10 - 11	3 - 4	7 - 8	0 - 0.5	0 - 0.5	3 - 4	7 - 8	0 - 0.5
Sample Date	10/8/1998	10/7/1998	10/7/1998	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
1,1,2,2-TETRACHLOROETHANE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
1,1,2-TRICHLOROETHANE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
1,1,2-TRICHLOROTRIFLUOROETHANE								
1,1-DICHLOROETHANE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
1,1-DICHLOROETHENE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
1,2-DICHLOROETHANE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
1,2-DICHLOROPROPANE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
2-BUTANONE	12 UJ	12 UJ	29 J	11 U	11 U	13 UJ	13 UJ	11 UJ
2-HEXANONE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
4-METHYL-2-PENTANONE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
ACETONE	41 J	12 U	86 J	11 U	11 U	13 U	13 U	11 U
BENZENE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
BROMODICHLOROMETHANE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
BROMOFORM	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
BROMOMETHANE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
CARBON DISULFIDE	12 U	12 U	2 J	11 U	11 U	13 U	13 U	11 U
CARBON TETRACHLORIDE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
CHLOROBENZENE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
CHLORODIBROMOMETHANE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
CHLOROETHANE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
CHLOROFORM	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
CHLOROMETHANE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
CIS-1,2-DICHLOROETHENE	22	12 U	12 U	11 U	11 U	13 U	13 U	11 U
CIS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
CYCLOHEXANE								
DIETHYL ETHER	12 U	12 UJ	12 U	11 U	11 U	13 UJ	13 U	11 U
ETHYLBENZENE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U

Round	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW011-SB008	S57SB009	S57SB009	S57SB009	S57SB009	S57SB010	S57SB010	S57SB011
Sample ID	S57SB0080201	S57SB0090101	S57SB0090201	S57SS0090101	S57SS0090101-D	S57SB0100101	S57SB0100201	S57SS0110101
Depth Range	10 - 11	3 - 4	7 - 8	0 - 0.5	0 - 0.5	3 - 4	7 - 8	0 - 0.5
Sample Date	10/8/1998	10/7/1998	10/7/1998	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
ISOPROPYLBENZENE								
M+P-XYLENES								
METHYL ACETATE								
METHYL CYCLOHEXANE								
METHYL TERT-BUTYL ETHER								
METHYLENE CHLORIDE	21 B	41 B	10 B	11 B	12 B	25 B	16 B	11 B
O-XYLENE								
STYRENE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
TETRACHLOROETHENE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
TOLUENE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
TOTAL XYLENES	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
TRANS-1,2-DICHLOROETHENE	20	12 U	12 U	11 U	11 U	13 U	13 U	11 U
TRANS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
TRICHLOROETHENE	41	12 U	12 U	11 U	11 U	13 U	13 U	11 U
VINYL CHLORIDE	12 U	12 U	12 U	11 U	11 U	13 U	13 U	11 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE	410 U							
1,2-DICHLOROBENZENE	410 U							
1,3,5-TRINITROBENZENE	250 U							
1,3-DICHLOROBENZENE	410 U							
1,4-DICHLOROBENZENE	410 U							
2,2'-OXYBIS(1-CHLOROPROPANE)	410 U							
2,4,5-TRICHLOROPHENOL	1000 U							
2,4,6-TRICHLOROPHENOL	410 U							
2,4-DICHLOROPHENOL	410 U							
2,4-DIMETHYLPHENOL	410 U							
2,4-DINITROPHENOL	1000 UJ							
2,4-DINITROTOLUENE	410 U							
2,6-DINITROTOLUENE	410 U							

Round	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW011-SB008	S57SB009	S57SB009	S57SB009	S57SB009	S57SB010	S57SB010	S57SB011
Sample ID	S57SB0080201	S57SB0090101	S57SB0090201	S57SS0090101	S57SS0090101-D	S57SB0100101	S57SB0100201	S57SS0110101
Depth Range	10 - 11	3 - 4	7 - 8	0 - 0.5	0 - 0.5	3 - 4	7 - 8	0 - 0.5
Sample Date	10/8/1998	10/7/1998	10/7/1998	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
2-CHLORONAPHTHALENE	410 U							
2-CHLOROPHENOL	410 U							
2-METHYLNAPHTHALENE	410 U							
2-METHYLPHENOL	410 U							
2-NITROANILINE	1000 U							
2-NITROPHENOL	410 U							
3,3'-DICHLOROBENZIDINE	410 U							
3-NITROANILINE	1000 UJ							
4,6-DINITRO-2-METHYLPHENOL	1000 U							
4-BROMOPHENYL PHENYL ETHER	410 U							
4-CHLORO-3-METHYLPHENOL	410 U							
4-CHLOROANILINE	410 U							
4-CHLOROPHENYL PHENYL ETHER	410 U							
4-METHYLPHENOL	410 U							
4-NITROANILINE	1000 U							
4-NITROPHENOL	1000 U							
ACENAPHTHENE	410 U							
ACENAPHTHYLENE	410 U							
ANTHRACENE	410 U							
BENZO(A)ANTHRACENE	410 U							
BENZO(A)PYRENE	410 U							
BENZO(B)FLUORANTHENE	410 U							
BENZO(G,H,I)PERYLENE	410 U							
BENZO(K)FLUORANTHENE	410 U							
BIS(2-CHLOROETHOXY)METHANE	410 U							
BIS(2-CHLOROETHYL)ETHER	410 U							
BIS(2-ETHYLHEXYL)PHTHALATE	410 U							
BUTYL BENZYL PHTHALATE	410 U							
CARBAZOLE	410 U							

Round	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW011-SB008	S57SB009	S57SB009	S57SB009	S57SB009	S57SB010	S57SB010	S57SB011
Sample ID	S57SB0080201	S57SB0090101	S57SB0090201	S57SS0090101	S57SS0090101-D	S57SB0100101	S57SB0100201	S57SS0110101
Depth Range	10 - 11	3 - 4	7 - 8	0 - 0.5	0 - 0.5	3 - 4	7 - 8	0 - 0.5
Sample Date	10/8/1998	10/7/1998	10/7/1998	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
CHRYSENE	410 U							
DI-N-BUTYL PHTHALATE	410 U							
DI-N-OCTYL PHTHALATE	410 U							
DIBENZO(A,H)ANTHRACENE	410 U							
DIBENZOFURAN	410 U							
DIETHYL PHTHALATE	410 U							
DIMETHYL PHTHALATE	410 U							
FLUORANTHENE	410 U							
FLUORENE	410 U							
HEXACHLOROBENZENE	410 U							
HEXACHLOROBUTADIENE	410 U							
HEXACHLOROCYCLOPENTADIENE	410 UJ							
HEXACHLOROETHANE	410 U							
INDENO(1,2,3-CD)PYRENE	410 U							
ISOPHORONE	410 U							
N-NITROSO-DI-N-PROPYLAMINE	410 U							
N-NITROSODIPHENYLAMINE	410 U							
NAPHTHALENE	410 U							
NITROBENZENE	410 U							
PENTACHLOROPHENOL	1000 U							
PHENANTHRENE	410 U							
PHENOL	410 U							
PYRENE	410 U							
Pesticides/PCBs (ug/kg)								
4,4'-DDD	4.1 U							
4,4'-DDE	4.1 U							
4,4'-DDT	4.1 U							
ALDRIN	2.1 U							
ALPHA-BHC	2.1 U							

Round	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW011-SB008	S57SB009	S57SB009	S57SB009	S57SB009	S57SB010	S57SB010	S57SB011
Sample ID	S57SB0080201	S57SB0090101	S57SB0090201	S57SS0090101	S57SS0090101-D	S57SB0100101	S57SB0100201	S57SS0110101
Depth Range	10 - 11	3 - 4	7 - 8	0 - 0.5	0 - 0.5	3 - 4	7 - 8	0 - 0.5
Sample Date	10/8/1998	10/7/1998	10/7/1998	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
ALPHA-CHLORDANE	2.1 U							
AROCLOR-1016	41 U							
AROCLOR-1221	82 U							
AROCLOR-1232	41 U							
AROCLOR-1242	41 U							
AROCLOR-1248	41 U							
AROCLOR-1254	41 U							
AROCLOR-1260	41 U							
BETA-BHC	2.1 U							
DELTA-BHC	2.1 U							
DIELDRIN	4.1 U							
ENDOSULFAN I	2.1 U							
ENDOSULFAN II	4.1 U							
ENDOSULFAN SULFATE	4.1 U							
ENDRIN	4.1 U							
ENDRIN ALDEHYDE	4.1 U							
ENDRIN KETONE	4.1 U							
GAMMA-BHC (LINDANE)	2.1 U							
GAMMA-CHLORDANE	2.1 U							
HEPTACHLOR	2.1 U							
HEPTACHLOR EPOXIDE	2.1 U							
METHOXYCHLOR	21 U							
TOXAPHENE	210 U							
Explosives (ug/kg)								
1,3-DINITROBENZENE	250 U							
2,4,6-TRINITROTOLUENE	250 U							
2,4-DINITROTOLUENE	250 U							
2,6-DINITROTOLUENE	250 U							
2-AMINO-4,6-DINITROTOLUENE	250 U							

Round	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW011-SB008	S57SB009	S57SB009	S57SB009	S57SB009	S57SB010	S57SB010	S57SB011
Sample ID	S57SB0080201	S57SB0090101	S57SB0090201	S57SS0090101	S57SS0090101-D	S57SB0100101	S57SB0100201	S57SS0110101
Depth Range	10 - 11	3 - 4	7 - 8	0 - 0.5	0 - 0.5	3 - 4	7 - 8	0 - 0.5
Sample Date	10/8/1998	10/7/1998	10/7/1998	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
2-NITROTOLUENE	500 U							
3-NITROTOLUENE	500 U							
4-AMINO-2,6-DINITROTOLUENE	250 U							
4-NITROTOLUENE	500 U							
HMX	500 U							
NITROBENZENE	250 U							
NITROCELLULOSE	205000							
NITROGLYCERIN	5000 U							
NITROGUANIDINE	0.51 U							
RDX	500 U							
TETRYL	500 UJ							
Inorganics (mg/kg)								
ALUMINUM	8650							
ANTIMONY	0.39 B							
ARSENIC	15.3							
BARIUM	46.1							
BERYLLIUM	1.0							
CADMIUM	0.14 U							
CALCIUM	2510							
CHROMIUM	14.0							
COBALT	5.3 K							
COPPER	15.6							
IRON	28800							
LEAD	47.4 K							
MAGNESIUM	902							
MANGANESE	60.9 J							
MERCURY	0.05							
NICKEL	6.4 K							
POTASSIUM	1140							

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1998Q4	1998Q4	1998Q4
Location	S57MW011-SB008	S57SB009	S57SB009	S57SB009	S57SB009	S57SB010	S57SB010	S57SB011
Sample ID	S57SB0080201	S57SB0090101	S57SB0090201	S57SS0090101	S57SS0090101-D	S57SB0100101	S57SB0100201	S57SS0110101
Depth Range	10 - 11	3 - 4	7 - 8	0 - 0.5	0 - 0.5	3 - 4	7 - 8	0 - 0.5
Sample Date	10/8/1998	10/7/1998	10/7/1998	1/22/1999	1/22/1999	10/7/1998	10/7/1998	10/7/1998
SELENIUM	0.27 UL							
SILVER	0.14 U							
SODIUM	39.4							
THALLIUM	0.47 B							
VANADIUM	42.6							
ZINC	36.0 K							
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)								
PH (MEQ/1)								
PH (S.U.)	8.34							
TOTAL ORGANIC CARBON (MG/KG)				50600 J	39600 J			
TOTAL SOLIDS (%)								
Field Parameters								
BULK DENSITY (PCF)								
POROSITY (%)								
SIEVE 1" (%)								
SIEVE 1-1/2" (%)								
SIEVE 1/2" (%)								
SIEVE 3/4" (%)								
SIEVE 3/8" (%)								
SIEVE NO. 004 (%)								
SIEVE NO. 010 (%)								
SIEVE NO. 020 (%)								
SIEVE NO. 040 (%)								
SIEVE NO. 100 (%)								
SIEVE NO. 200 (%)								
SPECIFIC GRAVITY (S.U.)								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57SB011	S57SB011	S57SB012	S57SB012	S57MW012-SB013	S57MW012-SB013	S57MW012-SB013	S57SB014
Sample ID	S57SB0110101	S57SB0110201	S57SB0120101	S57SB0120201	S57SS0130101	S57SB0130101	S57SB0130201	S57SB0140101
Depth Range	6 - 8	14 - 15	3 - 4	7 - 8	0 - 0.5	3 - 4	6 - 8	3 - 5
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/7/1998	1/9/1999	1/9/1999	1/12/1999	10/7/1998
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	12 U	13 U	12 U	4 J	11 U	12 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
1,1,2-TRICHLOROETHANE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
1,1,2-TRICHLOROTRIFLUOROETHANE								
1,1-DICHLOROETHANE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
1,1-DICHLOROETHENE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
1,2-DICHLOROETHANE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
1,2-DICHLOROPROPANE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
2-BUTANONE	12 UJ	13 UJ	12 UJ	13 UJ	11 U	12 U	12 U	11 UJ
2-HEXANONE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
4-METHYL-2-PENTANONE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
ACETONE	12 U	13 U	12 U	13 UJ	11 U	26	12 U	11 U
BENZENE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
BROMODICHLOROMETHANE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
BROMOFORM	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
BROMOMETHANE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
CARBON DISULFIDE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
CARBON TETRACHLORIDE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
CHLOROBENZENE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
CHLORODIBROMOMETHANE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
CHLOROETHANE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
CHLOROFORM	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
CHLOROMETHANE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
CIS-1,2-DICHLOROETHENE	12 U	7 J	12 U	13 UJ	11 U	12 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
CYCLOHEXANE								
DIETHYL ETHER	12 U	13 U	12 UJ	13 UJ	11 U	12 U	54	11 U
ETHYLBENZENE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U

Round	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57SB011	S57SB011	S57SB012	S57SB012	S57MW012-SB013	S57MW012-SB013	S57MW012-SB013	S57SB014
Sample ID	S57SB0110101	S57SB0110201	S57SB0120101	S57SB0120201	S57SS0130101	S57SB0130101	S57SB0130201	S57SB0140101
Depth Range	6 - 8	14 - 15	3 - 4	7 - 8	0 - 0.5	3 - 4	6 - 8	3 - 5
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/7/1998	1/9/1999	1/9/1999	1/12/1999	10/7/1998
ISOPROPYLBENZENE								
M+P-XYLENES								
METHYL ACETATE								
METHYL CYCLOHEXANE								
METHYL TERT-BUTYL ETHER								
METHYLENE CHLORIDE	8 B	13 B	18 B	110 J	8 B	7 B	5 B	17 B
O-XYLENE								
STYRENE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
TETRACHLOROETHENE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
TOLUENE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
TOTAL XYLENES	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
TRANS-1,2-DICHLOROETHENE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
TRICHLOROETHENE	12 U	31	35	8 J	11 U	12 U	12 U	11 U
VINYL CHLORIDE	12 U	13 U	12 U	13 UJ	11 U	12 U	12 U	11 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE					380 U	400 U	410 U	
1,2-DICHLOROBENZENE					380 U	400 U	410 U	
1,3,5-TRINITROBENZENE					227.3 U	227.3 U	250 U	
1,3-DICHLOROBENZENE					380 U	400 U	410 U	
1,4-DICHLOROBENZENE					380 U	400 U	410 U	
2,2'-OXYBIS(1-CHLOROPROPANE)					380 U	400 U	410 U	
2,4,5-TRICHLOROPHENOL					950 U	1000 U	1000 U	
2,4,6-TRICHLOROPHENOL					380 U	400 U	410 U	
2,4-DICHLOROPHENOL					380 U	400 U	410 U	
2,4-DIMETHYLPHENOL					380 U	400 U	410 U	
2,4-DINITROPHENOL					950 U	1000 U	1000 U	
2,4-DINITROTOLUENE					380 U	400 U	410 U	
2,6-DINITROTOLUENE					380 U	400 U	410 U	

Round	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57SB011	S57SB011	S57SB012	S57SB012	S57MW012-SB013	S57MW012-SB013	S57MW012-SB013	S57SB014
Sample ID	S57SB0110101	S57SB0110201	S57SB0120101	S57SB0120201	S57SS0130101	S57SB0130101	S57SB0130201	S57SB0140101
Depth Range	6 - 8	14 - 15	3 - 4	7 - 8	0 - 0.5	3 - 4	6 - 8	3 - 5
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/7/1998	1/9/1999	1/9/1999	1/12/1999	10/7/1998
2-CHLORONAPHTHALENE					380 U	400 U	410 U	
2-CHLOROPHENOL					380 U	400 U	410 U	
2-METHYLNAPHTHALENE					380 U	400 U	410 U	
2-METHYLPHENOL					380 U	400 U	410 U	
2-NITROANILINE					950 U	1000 U	1000 U	
2-NITROPHENOL					380 U	400 U	410 U	
3,3'-DICHLOROBENZIDINE					380 U	400 U	410 U	
3-NITROANILINE					950 U	1000 U	1000 U	
4,6-DINITRO-2-METHYLPHENOL					950 U	1000 U	1000 U	
4-BROMOPHENYL PHENYL ETHER					380 U	400 U	410 U	
4-CHLORO-3-METHYLPHENOL					380 U	400 U	410 U	
4-CHLOROANILINE					380 U	400 U	410 U	
4-CHLOROPHENYL PHENYL ETHER					380 U	400 U	410 U	
4-METHYLPHENOL					380 U	400 U	410 U	
4-NITROANILINE					950 U	1000 U	1000 U	
4-NITROPHENOL					950 U	1000 U	1000 U	
ACENAPHTHENE					380 U	400 U	410 U	
ACENAPHTHYLENE					380 U	400 U	410 U	
ANTHRACENE					380 U	400 U	410 U	
BENZO(A)ANTHRACENE					380 U	400 U	410 U	
BENZO(A)PYRENE					380 U	400 U	410 U	
BENZO(B)FLUORANTHENE					63 J	400 U	410 U	
BENZO(G,H,I)PERYLENE					380 U	400 U	410 U	
BENZO(K)FLUORANTHENE					380 U	400 U	410 U	
BIS(2-CHLOROETHOXY)METHANE					380 U	400 U	410 U	
BIS(2-CHLOROETHYL)ETHER					380 U	400 U	410 U	
BIS(2-ETHYLHEXYL)PHTHALATE					120 J	400 U	89 J	
BUTYL BENZYL PHTHALATE					380 U	400 U	410 U	
CARBAZOLE					380 U	400 U	410 U	

Round	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57SB011	S57SB011	S57SB012	S57SB012	S57MW012-SB013	S57MW012-SB013	S57MW012-SB013	S57SB014
Sample ID	S57SB0110101	S57SB0110201	S57SB0120101	S57SB0120201	S57SS0130101	S57SB0130101	S57SB0130201	S57SB0140101
Depth Range	6 - 8	14 - 15	3 - 4	7 - 8	0 - 0.5	3 - 4	6 - 8	3 - 5
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/7/1998	1/9/1999	1/9/1999	1/12/1999	10/7/1998
CHRYSENE					380 U	400 U	410 U	
DI-N-BUTYL PHTHALATE					380 U	200 J	410 U	
DI-N-OCTYL PHTHALATE					380 U	400 U	410 U	
DIBENZO(A,H)ANTHRACENE					380 U	400 U	410 U	
DIBENZOFURAN					380 U	400 U	410 U	
DIETHYL PHTHALATE					380 U	400 U	410 U	
DIMETHYL PHTHALATE					380 U	400 U	410 U	
FLUORANTHENE					55 J	400 U	410 U	
FLUORENE					380 U	400 U	410 U	
HEXACHLOROBENZENE					380 U	400 U	410 U	
HEXACHLOROBUTADIENE					380 U	400 U	410 U	
HEXACHLOROCYCLOPENTADIENE					380 U	400 U	410 U	
HEXACHLOROETHANE					380 U	400 U	410 U	
INDENO(1,2,3-CD)PYRENE					380 U	400 U	410 U	
ISOPHORONE					380 U	400 U	410 U	
N-NITROSO-DI-N-PROPYLAMINE					380 U	400 U	410 U	
N-NITROSODIPHENYLAMINE					380 U	400 U	410 U	
NAPHTHALENE					380 U	400 U	410 U	
NITROBENZENE					380 U	400 U	410 U	
PENTACHLOROPHENOL					950 U	1000 U	1000 U	
PHENANTHRENE					380 U	400 U	410 U	
PHENOL					380 U	400 U	410 U	
PYRENE					50 J	400 U	410 U	
Pesticides/PCBs (ug/kg)								
4,4'-DDD					3.8 U	4.0 U	4.1 U	
4,4'-DDE					3.8 U	4.0 U	4.1 U	
4,4'-DDT					3.8 U	4.0 U	4.1 U	
ALDRIN					1.9 U	2.0 U	2.0 U	
ALPHA-BHC					1.9 U	2.0 U	2.0 U	

Round	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57SB011	S57SB011	S57SB012	S57SB012	S57MW012-SB013	S57MW012-SB013	S57MW012-SB013	S57SB014
Sample ID	S57SB0110101	S57SB0110201	S57SB0120101	S57SB0120201	S57SS0130101	S57SB0130101	S57SB0130201	S57SB0140101
Depth Range	6 - 8	14 - 15	3 - 4	7 - 8	0 - 0.5	3 - 4	6 - 8	3 - 5
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/7/1998	1/9/1999	1/9/1999	1/12/1999	10/7/1998
ALPHA-CHLORDANE					1.9 U	2.0 U	2.0 U	
AROCLOR-1016					38 U	40 U	41 U	
AROCLOR-1221					76 U	80 U	81 U	
AROCLOR-1232					38 U	40 U	41 U	
AROCLOR-1242					38 U	40 U	41 U	
AROCLOR-1248					38 U	40 U	41 U	
AROCLOR-1254					38 U	40 U	41 U	
AROCLOR-1260					38 U	40 U	41 U	
BETA-BHC					1.9 U	2.0 U	2.0 U	
DELTA-BHC					1.9 U	2.0 U	2.0 U	
DIELDRIN					3.8 U	4.0 U	4.1 U	
ENDOSULFAN I					1.9 U	2.0 U	2.0 U	
ENDOSULFAN II					3.8 U	4.0 U	4.1 U	
ENDOSULFAN SULFATE					3.8 UJ	4.0 UJ	4.1 U	
ENDRIN					3.8 U	4.0 U	4.1 U	
ENDRIN ALDEHYDE					3.8 U	4.0 U	4.1 U	
ENDRIN KETONE					3.8 U	4.0 U	4.1 U	
GAMMA-BHC (LINDANE)					1.9 U	2.0 U	2.0 U	
GAMMA-CHLORDANE					1.9 U	2.0 U	2.0 U	
HEPTACHLOR					1.9 U	2.0 U	2.0 U	
HEPTACHLOR EPOXIDE					1.9 U	2.0 U	2.0 U	
METHOXYCHLOR					19 U	20 U	20 U	
TOXAPHENE					190 U	200 U	200 U	
Explosives (ug/kg)								
1,3-DINITROBENZENE					227.3 U	227.3 U	250 U	
2,4,6-TRINITROTOLUENE					227.3 U	227.3 U	250 U	
2,4-DINITROTOLUENE					227.3 U	227.3 U	250 U	
2,6-DINITROTOLUENE					227.3 U	227.3 U	250 U	
2-AMINO-4,6-DINITROTOLUENE					227.3 U	227.3 U	250 U	

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57SB011	S57SB011	S57SB012	S57SB012	S57MW012-SB013	S57MW012-SB013	S57MW012-SB013	S57SB014
Sample ID	S57SB0110101	S57SB0110201	S57SB0120101	S57SB0120201	S57SS0130101	S57SB0130101	S57SB0130201	S57SB0140101
Depth Range	6 - 8	14 - 15	3 - 4	7 - 8	0 - 0.5	3 - 4	6 - 8	3 - 5
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/7/1998	1/9/1999	1/9/1999	1/12/1999	10/7/1998
2-NITROTOLUENE					454.5 U	454.5 U	500 U	
3-NITROTOLUENE					454.5 U	454.5 U	500 U	
4-AMINO-2,6-DINITROTOLUENE					227.3 U	227.3 U	250 U	
4-NITROTOLUENE					454.5 U	454.5 U	500 U	
HMX					454.5 U	454.5 U	500 U	
NITROBENZENE					227.3 U	227.3 U	250 U	
NITROCELLULOSE					41000 UR	38900 UR	50400 L	
NITROGLYCERIN					4545.4 U	4545.4 U	5000 U	
NITROGUANIDINE					0.51 U	0.51 U	0.51 U	
RDX					454.5 U	454.5 U	500 U	
TETRYL					454.5 U	454.5 U	500 U	
Inorganics (mg/kg)								
ALUMINUM					6660	7780	5410 J	
ANTIMONY					0.87 L	0.98 UR	0.52 UL	
ARSENIC					9.6	2.9	2.6 L	
BARIUM					26.8	24.5	34.2	
BERYLLIUM					0.27	0.22	0.52	
CADMIUM					0.21	0.09 U	0.18 B	
CALCIUM					1580	573	796	
CHROMIUM					22.7	9.8	10.9 J	
COBALT					10.3	1.4	6.2	
COPPER					15.0	7.5	6.2	
IRON					13000	9360	10600	
LEAD					120	8.4	8.2 J	
MAGNESIUM					9150 J	549 J	350	
MANGANESE					124 L	26.0 L	42.3 K	
MERCURY					0.08	0.02	0.03	
NICKEL					135 J	4.1 J	3.0	
POTASSIUM					398	743	370	

Round	1998Q4	1998Q4	1998Q4	1998Q4	1999Q1	1999Q1	1999Q1	1998Q4
Location	S57SB011	S57SB011	S57SB012	S57SB012	S57MW012-SB013	S57MW012-SB013	S57MW012-SB013	S57SB014
Sample ID	S57SB0110101	S57SB0110201	S57SB0120101	S57SB0120201	S57SS0130101	S57SB0130101	S57SB0130201	S57SB0140101
Depth Range	6 - 8	14 - 15	3 - 4	7 - 8	0 - 0.5	3 - 4	6 - 8	3 - 5
Sample Date	10/7/1998	10/7/1998	10/7/1998	10/7/1998	1/9/1999	1/9/1999	1/12/1999	10/7/1998
SELENIUM					0.33 U	0.82 K	0.50 UL	
SILVER					0.14 U	0.19 U	0.14 U	
SODIUM					144	95.2	70.8 B	
THALLIUM					0.71 U	0.96 U	0.65 UL	
VANADIUM					20.7	21.9	20.6	
ZINC					94.4	15.3	13.8	
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)								
PH (MEQ/1)								
PH (S.U.)					8.36	7.79	6.57	
TOTAL ORGANIC CARBON (MG/KG)								
TOTAL SOLIDS (%)								
Field Parameters								
BULK DENSITY (PCF)								
POROSITY (%)								
SIEVE 1" (%)								
SIEVE 1-1/2" (%)								
SIEVE 1/2" (%)								
SIEVE 3/4" (%)								
SIEVE 3/8" (%)								
SIEVE NO. 004 (%)								
SIEVE NO. 010 (%)								
SIEVE NO. 020 (%)								
SIEVE NO. 040 (%)								
SIEVE NO. 100 (%)								
SIEVE NO. 200 (%)								
SPECIFIC GRAVITY (S.U.)								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1998Q4	1999Q1	1999Q1	1999Q1	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB014	S57MW005-SB015	S57MW005-SB015	S57MW005-SB015	S57SB016	S57SB016	S57SB016	S57SB016
Sample ID	S57SB0140201	S57SS0150101	S57SB0150101	S57SB0150201	S57SS0160103	S57SB0160103	S57SB0160103-D	S57SB0160203
Depth Range	7 - 8	0 - 0.5	2 - 4	10 - 12	0 - 0.5	4 - 5	4 - 5	8 - 10
Sample Date	10/7/1998	1/11/1999	1/11/1999	1/11/1999	8/23/2001	8/23/2001	8/23/2001	8/23/2001
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
1,1,2,2-TETRACHLOROETHANE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
1,1,2-TRICHLOROETHANE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
1,1,2-TRICHLOROTRIFLUOROETHANE					5.3 U	5 U	5.9 U	6.1 U
1,1-DICHLOROETHANE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
1,1-DICHLOROETHENE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
1,2-DICHLOROETHANE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
1,2-DICHLOROPROPANE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
2-BUTANONE	12 UJ	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
2-HEXANONE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
4-METHYL-2-PENTANONE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
ACETONE	14 J	12 U	12 U	12 U	5.3 U	5 U	5.9 U	280 J
BENZENE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
BROMODICHLOROMETHANE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
BROMOFORM	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
BROMOMETHANE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
CARBON DISULFIDE	12 U	12 U	12 U	2 J	5.3 U	5 U	5.9 U	6.1 U
CARBON TETRACHLORIDE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
CHLOROBENZENE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
CHLORODIBROMOMETHANE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
CHLOROETHANE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
CHLOROFORM	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
CHLOROMETHANE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
CIS-1,2-DICHLOROETHENE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
CIS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
CYCLOHEXANE					5.3 U	5 U	5.9 U	6.1 U
DIETHYL ETHER	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
ETHYLBENZENE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U

Round	1998Q4	1999Q1	1999Q1	1999Q1	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB014	S57MW005-SB015	S57MW005-SB015	S57MW005-SB015	S57SB016	S57SB016	S57SB016	S57SB016
Sample ID	S57SB0140201	S57SS0150101	S57SB0150101	S57SB0150201	S57SS0160103	S57SB0160103	S57SB0160103-D	S57SB0160203
Depth Range	7 - 8	0 - 0.5	2 - 4	10 - 12	0 - 0.5	4 - 5	4 - 5	8 - 10
Sample Date	10/7/1998	1/11/1999	1/11/1999	1/11/1999	8/23/2001	8/23/2001	8/23/2001	8/23/2001
ISOPROPYLBENZENE					5.3 U	5 U	5.9 U	6.1 U
M+P-XYLENES					5.3 U	5 U	5.9 U	6.1 U
METHYL ACETATE					5.3 U	5 U	5.9 U	6.1 U
METHYL CYCLOHEXANE					5.3 U	5 U	5.9 U	6.1 U
METHYL TERT-BUTYL ETHER					5.3 U	5 U	5.9 U	6.1 U
METHYLENE CHLORIDE	11 B	7 B	7 B	8 B	3.5 B	3.1 B	5.7 B	8 B
O-XYLENE					5.3 U	5 U	5.9 U	6.1 U
STYRENE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
TETRACHLOROETHENE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
TOLUENE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
TOTAL XYLENES	12 U	12 U	12 U	12 U				
TRANS-1,2-DICHLOROETHENE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
TRANS-1,3-DICHLOROPROPENE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
TRICHLOROETHENE	12 U	12 U	12 U	2 J	5.3 U	5 U	5.6 J	6.1 U
VINYL CHLORIDE	12 U	12 U	12 U	12 U	5.3 U	5 U	5.9 U	6.1 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE								
1,2-DICHLOROBENZENE								
1,3,5-TRINITROBENZENE								
1,3-DICHLOROBENZENE								
1,4-DICHLOROBENZENE								
2,2'-OXYBIS(1-CHLOROPROPANE)								
2,4,5-TRICHLOROPHENOL								
2,4,6-TRICHLOROPHENOL								
2,4-DICHLOROPHENOL								
2,4-DIMETHYLPHENOL								
2,4-DINITROPHENOL								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								

Round	1998Q4	1999Q1	1999Q1	1999Q1	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB014	S57MW005-SB015	S57MW005-SB015	S57MW005-SB015	S57SB016	S57SB016	S57SB016	S57SB016
Sample ID	S57SB0140201	S57SS0150101	S57SB0150101	S57SB0150201	S57SS0160103	S57SB0160103	S57SB0160103-D	S57SB0160203
Depth Range	7 - 8	0 - 0.5	2 - 4	10 - 12	0 - 0.5	4 - 5	4 - 5	8 - 10
Sample Date	10/7/1998	1/11/1999	1/11/1999	1/11/1999	8/23/2001	8/23/2001	8/23/2001	8/23/2001
2-CHLORONAPHTHALENE								
2-CHLOROPHENOL								
2-METHYLNAPHTHALENE								
2-METHYLPHENOL								
2-NITROANILINE								
2-NITROPHENOL								
3,3'-DICHLOROBENZIDINE								
3-NITROANILINE								
4,6-DINITRO-2-METHYLPHENOL								
4-BROMOPHENYL PHENYL ETHER								
4-CHLORO-3-METHYLPHENOL								
4-CHLOROANILINE								
4-CHLOROPHENYL PHENYL ETHER								
4-METHYLPHENOL								
4-NITROANILINE								
4-NITROPHENOL								
ACENAPHTHENE								
ACENAPHTHYLENE								
ANTHRACENE								
BENZO(A)ANTHRACENE								
BENZO(A)PYRENE								
BENZO(B)FLUORANTHENE								
BENZO(G,H,I)PERYLENE								
BENZO(K)FLUORANTHENE								
BIS(2-CHLOROETHOXY)METHANE								
BIS(2-CHLOROETHYL)ETHER								
BIS(2-ETHYLHEXYL)PHTHALATE								
BUTYL BENZYL PHTHALATE								
CARBAZOLE								

Round	1998Q4	1999Q1	1999Q1	1999Q1	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB014	S57MW005-SB015	S57MW005-SB015	S57MW005-SB015	S57SB016	S57SB016	S57SB016	S57SB016
Sample ID	S57SB0140201	S57SS0150101	S57SB0150101	S57SB0150201	S57SS0160103	S57SB0160103	S57SB0160103-D	S57SB0160203
Depth Range	7 - 8	0 - 0.5	2 - 4	10 - 12	0 - 0.5	4 - 5	4 - 5	8 - 10
Sample Date	10/7/1998	1/11/1999	1/11/1999	1/11/1999	8/23/2001	8/23/2001	8/23/2001	8/23/2001
CHRYSENE								
DI-N-BUTYL PHTHALATE								
DI-N-OCTYL PHTHALATE								
DIBENZO(A,H)ANTHRACENE								
DIBENZOFURAN								
DIETHYL PHTHALATE								
DIMETHYL PHTHALATE								
FLUORANTHENE								
FLUORENE								
HEXACHLOROBENZENE								
HEXACHLOROBUTADIENE								
HEXACHLOROCYCLOPENTADIENE								
HEXACHLOROETHANE								
INDENO(1,2,3-CD)PYRENE								
ISOPHORONE								
N-NITROSO-DI-N-PROPYLAMINE								
N-NITROSODIPHENYLAMINE								
NAPHTHALENE								
NITROBENZENE								
PENTACHLOROPHENOL								
PHENANTHRENE								
PHENOL								
PYRENE								
Pesticides/PCBs (ug/kg)								
4,4'-DDD								
4,4'-DDE								
4,4'-DDT								
ALDRIN								
ALPHA-BHC								

Round	1998Q4	1999Q1	1999Q1	1999Q1	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB014	S57MW005-SB015	S57MW005-SB015	S57MW005-SB015	S57SB016	S57SB016	S57SB016	S57SB016
Sample ID	S57SB0140201	S57SS0150101	S57SB0150101	S57SB0150201	S57SS0160103	S57SB0160103	S57SB0160103-D	S57SB0160203
Depth Range	7 - 8	0 - 0.5	2 - 4	10 - 12	0 - 0.5	4 - 5	4 - 5	8 - 10
Sample Date	10/7/1998	1/11/1999	1/11/1999	1/11/1999	8/23/2001	8/23/2001	8/23/2001	8/23/2001
ALPHA-CHLORDANE								
AROCLOR-1016								
AROCLOR-1221								
AROCLOR-1232								
AROCLOR-1242								
AROCLOR-1248								
AROCLOR-1254								
AROCLOR-1260								
BETA-BHC								
DELTA-BHC								
DIELDRIN								
ENDOSULFAN I								
ENDOSULFAN II								
ENDOSULFAN SULFATE								
ENDRIN								
ENDRIN ALDEHYDE								
ENDRIN KETONE								
GAMMA-BHC (LINDANE)								
GAMMA-CHLORDANE								
HEPTACHLOR								
HEPTACHLOR EPOXIDE								
METHOXYCHLOR								
TOXAPHENE								
Explosives (ug/kg)								
1,3-DINITROBENZENE								
2,4,6-TRINITROTOLUENE								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								
2-AMINO-4,6-DINITROTOLUENE								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1998Q4	1999Q1	1999Q1	1999Q1	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB014	S57MW005-SB015	S57MW005-SB015	S57MW005-SB015	S57SB016	S57SB016	S57SB016	S57SB016
Sample ID	S57SB0140201	S57SS0150101	S57SB0150101	S57SB0150201	S57SS0160103	S57SB0160103	S57SB0160103-D	S57SB0160203
Depth Range	7 - 8	0 - 0.5	2 - 4	10 - 12	0 - 0.5	4 - 5	4 - 5	8 - 10
Sample Date	10/7/1998	1/11/1999	1/11/1999	1/11/1999	8/23/2001	8/23/2001	8/23/2001	8/23/2001
2-NITROTOLUENE								
3-NITROTOLUENE								
4-AMINO-2,6-DINITROTOLUENE								
4-NITROTOLUENE								
HMX								
NITROBENZENE								
NITROCELLULOSE								
NITROGLYCERIN								
NITROGUANIDINE								
RDX								
TETRYL								
Inorganics (mg/kg)								
ALUMINUM								
ANTIMONY								
ARSENIC					6.9	35.2 J	1.5 UJ	
BARIUM								
BERYLLIUM								
CADMIUM								
CALCIUM								
CHROMIUM								
COBALT								
COPPER								
IRON								
LEAD								
MAGNESIUM								
MANGANESE								
MERCURY								
NICKEL								
POTASSIUM								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	1998Q4	1999Q1	1999Q1	1999Q1	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB014	S57MW005-SB015	S57MW005-SB015	S57MW005-SB015	S57SB016	S57SB016	S57SB016	S57SB016
Sample ID	S57SB0140201	S57SS0150101	S57SB0150101	S57SB0150201	S57SS0160103	S57SB0160103	S57SB0160103-D	S57SB0160203
Depth Range	7 - 8	0 - 0.5	2 - 4	10 - 12	0 - 0.5	4 - 5	4 - 5	8 - 10
Sample Date	10/7/1998	1/11/1999	1/11/1999	1/11/1999	8/23/2001	8/23/2001	8/23/2001	8/23/2001
SELENIUM								
SILVER								
SODIUM								
THALLIUM								
VANADIUM								
ZINC								
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)						160 J	550 J	
PH (MEQ/1)						7.17	6.4	
PH (S.U.)								
TOTAL ORGANIC CARBON (MG/KG)				8840				
TOTAL SOLIDS (%)								
Field Parameters								
BULK DENSITY (PCF)						129.8		
POROSITY (%)						32.9		
SIEVE 1" (%)								
SIEVE 1-1/2" (%)								
SIEVE 1/2" (%)						93.3		
SIEVE 3/4" (%)						100		
SIEVE 3/8" (%)						89.3		
SIEVE NO. 004 (%)						79.5		
SIEVE NO. 010 (%)						68.4		
SIEVE NO. 020 (%)						63		
SIEVE NO. 040 (%)						55.3		
SIEVE NO. 100 (%)						45		
SIEVE NO. 200 (%)						41		
SPECIFIC GRAVITY (S.U.)						2.65		

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB016	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB018
Sample ID	S57SB0160303	S57SS0170103	S57SS0170103-D	S57SB0170103	S57SB0170203	S57SB0170303	S57SB0170403	S57SS0180103
Depth Range	18 - 20	0 - 0.5	0 - 0.5	4 - 5	8 - 10	14 - 16	18 - 20	0 - 0.5
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
1,1,2,2-TETRACHLOROETHANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
1,1,2-TRICHLOROETHANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
1,1,2-TRICHLOROTRIFLUOROETHANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
1,1-DICHLOROETHANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
1,1-DICHLOROETHENE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
1,2-DICHLOROETHANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
1,2-DICHLOROPROPANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
2-BUTANONE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
2-HEXANONE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
4-METHYL-2-PENTANONE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
ACETONE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
BENZENE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
BROMODICHLOROMETHANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
BROMOFORM	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
BROMOMETHANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
CARBON DISULFIDE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
CARBON TETRACHLORIDE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
CHLOROBENZENE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
CHLORODIBROMOMETHANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
CHLOROETHANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
CHLOROFORM	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
CHLOROMETHANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
CIS-1,2-DICHLOROETHENE	6.2 U	21	24	16	6 U	5.9 U	6.1 U	5.5 U
CIS-1,3-DICHLOROPROPENE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
CYCLOHEXANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
DIETHYL ETHER	8.3	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
ETHYLBENZENE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB016	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB018
Sample ID	S57SB0160303	S57SS0170103	S57SS0170103-D	S57SB0170103	S57SB0170203	S57SB0170303	S57SB0170403	S57SS0180103
Depth Range	18 - 20	0 - 0.5	0 - 0.5	4 - 5	8 - 10	14 - 16	18 - 20	0 - 0.5
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
ISOPROPYLBENZENE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
M+P-XYLENES	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
METHYL ACETATE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
METHYL CYCLOHEXANE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
METHYL TERT-BUTYL ETHER	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
METHYLENE CHLORIDE	5.3 B	6.2 B	7.4 B	8.2 B	6.3 B	6.2 B	7.8 B	3.4 B
O-XYLENE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
STYRENE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
TETRACHLOROETHENE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
TOLUENE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
TOTAL XYLENES								
TRANS-1,2-DICHLOROETHENE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
TRANS-1,3-DICHLOROPROPENE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
TRICHLOROETHENE	6.2 U	220	210	5.5 J	6 U	5.9 U	6.1 U	5.5 U
VINYL CHLORIDE	6.2 U	5.8 U	6 U	6.6 U	6 U	5.9 U	6.1 U	5.5 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE								
1,2-DICHLOROBENZENE								
1,3,5-TRINITROBENZENE								
1,3-DICHLOROBENZENE								
1,4-DICHLOROBENZENE								
2,2'-OXYBIS(1-CHLOROPROPANE)								
2,4,5-TRICHLOROPHENOL								
2,4,6-TRICHLOROPHENOL								
2,4-DICHLOROPHENOL								
2,4-DIMETHYLPHENOL								
2,4-DINITROPHENOL								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB016	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB018
Sample ID	S57SB0160303	S57SS0170103	S57SS0170103-D	S57SB0170103	S57SB0170203	S57SB0170303	S57SB0170403	S57SS0180103
Depth Range	18 - 20	0 - 0.5	0 - 0.5	4 - 5	8 - 10	14 - 16	18 - 20	0 - 0.5
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
2-CHLORONAPHTHALENE								
2-CHLOROPHENOL								
2-METHYLNAPHTHALENE								
2-METHYLPHENOL								
2-NITROANILINE								
2-NITROPHENOL								
3,3'-DICHLOROBENZIDINE								
3-NITROANILINE								
4,6-DINITRO-2-METHYLPHENOL								
4-BROMOPHENYL PHENYL ETHER								
4-CHLORO-3-METHYLPHENOL								
4-CHLOROANILINE								
4-CHLOROPHENYL PHENYL ETHER								
4-METHYLPHENOL								
4-NITROANILINE								
4-NITROPHENOL								
ACENAPHTHENE								
ACENAPHTHYLENE								
ANTHRACENE								
BENZO(A)ANTHRACENE								
BENZO(A)PYRENE								
BENZO(B)FLUORANTHENE								
BENZO(G,H,I)PERYLENE								
BENZO(K)FLUORANTHENE								
BIS(2-CHLOROETHOXY)METHANE								
BIS(2-CHLOROETHYL)ETHER								
BIS(2-ETHYLHEXYL)PHTHALATE								
BUTYL BENZYL PHTHALATE								
CARBAZOLE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB016	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB018
Sample ID	S57SB0160303	S57SS0170103	S57SS0170103-D	S57SB0170103	S57SB0170203	S57SB0170303	S57SB0170403	S57SS0180103
Depth Range	18 - 20	0 - 0.5	0 - 0.5	4 - 5	8 - 10	14 - 16	18 - 20	0 - 0.5
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
CHRYSENE								
DI-N-BUTYL PHTHALATE								
DI-N-OCTYL PHTHALATE								
DIBENZO(A,H)ANTHRACENE								
DIBENZOFURAN								
DIETHYL PHTHALATE								
DIMETHYL PHTHALATE								
FLUORANTHENE								
FLUORENE								
HEXACHLOROBENZENE								
HEXACHLOROBUTADIENE								
HEXACHLOROCYCLOPENTADIENE								
HEXACHLOROETHANE								
INDENO(1,2,3-CD)PYRENE								
ISOPHORONE								
N-NITROSO-DI-N-PROPYLAMINE								
N-NITROSODIPHENYLAMINE								
NAPHTHALENE								
NITROBENZENE								
PENTACHLOROPHENOL								
PHENANTHRENE								
PHENOL								
PYRENE								
Pesticides/PCBs (ug/kg)								
4,4'-DDD								
4,4'-DDE								
4,4'-DDT								
ALDRIN								
ALPHA-BHC								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB016	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB018
Sample ID	S57SB0160303	S57SS0170103	S57SS0170103-D	S57SB0170103	S57SB0170203	S57SB0170303	S57SB0170403	S57SS0180103
Depth Range	18 - 20	0 - 0.5	0 - 0.5	4 - 5	8 - 10	14 - 16	18 - 20	0 - 0.5
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
ALPHA-CHLORDANE								
AROCLOR-1016								
AROCLOR-1221								
AROCLOR-1232								
AROCLOR-1242								
AROCLOR-1248								
AROCLOR-1254								
AROCLOR-1260								
BETA-BHC								
DELTA-BHC								
DIELDRIN								
ENDOSULFAN I								
ENDOSULFAN II								
ENDOSULFAN SULFATE								
ENDRIN								
ENDRIN ALDEHYDE								
ENDRIN KETONE								
GAMMA-BHC (LINDANE)								
GAMMA-CHLORDANE								
HEPTACHLOR								
HEPTACHLOR EPOXIDE								
METHOXYCHLOR								
TOXAPHENE								
Explosives (ug/kg)								
1,3-DINITROBENZENE								
2,4,6-TRINITROTOLUENE								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								
2-AMINO-4,6-DINITROTOLUENE								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB016	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB018
Sample ID	S57SB0160303	S57SS0170103	S57SS0170103-D	S57SB0170103	S57SB0170203	S57SB0170303	S57SB0170403	S57SS0180103
Depth Range	18 - 20	0 - 0.5	0 - 0.5	4 - 5	8 - 10	14 - 16	18 - 20	0 - 0.5
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
2-NITROTOLUENE								
3-NITROTOLUENE								
4-AMINO-2,6-DINITROTOLUENE								
4-NITROTOLUENE								
HMX								
NITROBENZENE								
NITROCELLULOSE								
NITROGLYCERIN								
NITROGUANIDINE								
RDX								
TETRYL								
Inorganics (mg/kg)								
ALUMINUM								
ANTIMONY								
ARSENIC		21	21.8	2.6				26.6
BARIUM								
BERYLLIUM								
CADMIUM								
CALCIUM								
CHROMIUM								
COBALT								
COPPER								
IRON								
LEAD								
MAGNESIUM								
MANGANESE								
MERCURY								
NICKEL								
POTASSIUM								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB016	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB017	S57SB018
Sample ID	S57SB0160303	S57SS0170103	S57SS0170103-D	S57SB0170103	S57SB0170203	S57SB0170303	S57SB0170403	S57SS0180103
Depth Range	18 - 20	0 - 0.5	0 - 0.5	4 - 5	8 - 10	14 - 16	18 - 20	0 - 0.5
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
SELENIUM								
SILVER								
SODIUM								
THALLIUM								
VANADIUM								
ZINC								
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)	70 J							
PH (MEQ/1)	5.5							
PH (S.U.)								
TOTAL ORGANIC CARBON (MG/KG)								
TOTAL SOLIDS (%)								
Field Parameters								
BULK DENSITY (PCF)	111.7							
POROSITY (%)	43.3							
SIEVE 1" (%)								
SIEVE 1-1/2" (%)								
SIEVE 1/2" (%)								
SIEVE 3/4" (%)								
SIEVE 3/8" (%)	100							
SIEVE NO. 004 (%)	98.7							
SIEVE NO. 010 (%)	97.5							
SIEVE NO. 020 (%)	74.3							
SIEVE NO. 040 (%)	34.1							
SIEVE NO. 100 (%)	13.4							
SIEVE NO. 200 (%)	8.5							
SPECIFIC GRAVITY (S.U.)	2.63							

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB018	S57SB018	S57SB018	S57SB018	S57SB018	S57SB019	S57SB019	S57SB019
Sample ID	S57SS0180103-D	S57SB0180103	S57SB0180203	S57SB0180303	S57SB0180403	S57SS0190103	S57SB0190103	S57SB0190203
Depth Range	0 - 0.5	4 - 5	8 - 10	16 - 18	18 - 20	0 - 0.5	4 - 5	8 - 10
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
1,1,2,2-TETRACHLOROETHANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
1,1,2-TRICHLOROETHANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
1,1,2-TRICHLOROTRIFLUOROETHANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
1,1-DICHLOROETHANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
1,1-DICHLOROETHENE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
1,2-DICHLOROETHANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
1,2-DICHLOROPROPANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
2-BUTANONE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
2-HEXANONE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
4-METHYL-2-PENTANONE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
ACETONE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
BENZENE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
BROMODICHLOROMETHANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
BROMOFORM	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
BROMOMETHANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
CARBON DISULFIDE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
CARBON TETRACHLORIDE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
CHLOROBENZENE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
CHLORODIBROMOMETHANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
CHLOROETHANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
CHLOROFORM	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
CHLOROMETHANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
CIS-1,2-DICHLOROETHENE	5.5 U	84	5.7 U	6.3 U	5.8 U	12	32	5.7 U
CIS-1,3-DICHLOROPROPENE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
CYCLOHEXANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
DIETHYL ETHER	5.5 U	6.8 U	5.7 U	36	4.6 J	5.5 U	6.5 U	5.7 U
ETHYLBENZENE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB018	S57SB018	S57SB018	S57SB018	S57SB018	S57SB019	S57SB019	S57SB019
Sample ID	S57SS0180103-D	S57SB0180103	S57SB0180203	S57SB0180303	S57SB0180403	S57SS0190103	S57SB0190103	S57SB0190203
Depth Range	0 - 0.5	4 - 5	8 - 10	16 - 18	18 - 20	0 - 0.5	4 - 5	8 - 10
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
ISOPROPYLBENZENE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
M+P-XYLENES	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
METHYL ACETATE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
METHYL CYCLOHEXANE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
METHYL TERT-BUTYL ETHER	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
METHYLENE CHLORIDE	6.3 B	12 B	6.8 B	8.4 B	7.7 B	4.3 B	7.2 B	9.2 B
O-XYLENE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
STYRENE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
TETRACHLOROETHENE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
TOLUENE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
TOTAL XYLENES								
TRANS-1,2-DICHLOROETHENE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
TRANS-1,3-DICHLOROPROPENE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
TRICHLOROETHENE	5.5 U	270	5.7 U	6.3 U	5.8 U	49	52	4.6 J
VINYL CHLORIDE	5.5 U	6.8 U	5.7 U	6.3 U	5.8 U	5.5 U	6.5 U	5.7 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE								
1,2-DICHLOROBENZENE								
1,3,5-TRINITROBENZENE								
1,3-DICHLOROBENZENE								
1,4-DICHLOROBENZENE								
2,2'-OXYBIS(1-CHLOROPROPANE)								
2,4,5-TRICHLOROPHENOL								
2,4,6-TRICHLOROPHENOL								
2,4-DICHLOROPHENOL								
2,4-DIMETHYLPHENOL								
2,4-DINITROPHENOL								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB018	S57SB018	S57SB018	S57SB018	S57SB018	S57SB019	S57SB019	S57SB019
Sample ID	S57SS0180103-D	S57SB0180103	S57SB0180203	S57SB0180303	S57SB0180403	S57SS0190103	S57SB0190103	S57SB0190203
Depth Range	0 - 0.5	4 - 5	8 - 10	16 - 18	18 - 20	0 - 0.5	4 - 5	8 - 10
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
2-CHLORONAPHTHALENE								
2-CHLOROPHENOL								
2-METHYLNAPHTHALENE								
2-METHYLPHENOL								
2-NITROANILINE								
2-NITROPHENOL								
3,3'-DICHLOROBENZIDINE								
3-NITROANILINE								
4,6-DINITRO-2-METHYLPHENOL								
4-BROMOPHENYL PHENYL ETHER								
4-CHLORO-3-METHYLPHENOL								
4-CHLOROANILINE								
4-CHLOROPHENYL PHENYL ETHER								
4-METHYLPHENOL								
4-NITROANILINE								
4-NITROPHENOL								
ACENAPHTHENE								
ACENAPHTHYLENE								
ANTHRACENE								
BENZO(A)ANTHRACENE								
BENZO(A)PYRENE								
BENZO(B)FLUORANTHENE								
BENZO(G,H,I)PERYLENE								
BENZO(K)FLUORANTHENE								
BIS(2-CHLOROETHOXY)METHANE								
BIS(2-CHLOROETHYL)ETHER								
BIS(2-ETHYLHEXYL)PHTHALATE								
BUTYL BENZYL PHTHALATE								
CARBAZOLE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB018	S57SB018	S57SB018	S57SB018	S57SB018	S57SB019	S57SB019	S57SB019
Sample ID	S57SS0180103-D	S57SB0180103	S57SB0180203	S57SB0180303	S57SB0180403	S57SS0190103	S57SB0190103	S57SB0190203
Depth Range	0 - 0.5	4 - 5	8 - 10	16 - 18	18 - 20	0 - 0.5	4 - 5	8 - 10
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
CHRYSENE								
DI-N-BUTYL PHTHALATE								
DI-N-OCTYL PHTHALATE								
DIBENZO(A,H)ANTHRACENE								
DIBENZOFURAN								
DIETHYL PHTHALATE								
DIMETHYL PHTHALATE								
FLUORANTHENE								
FLUORENE								
HEXACHLOROBENZENE								
HEXACHLOROBUTADIENE								
HEXACHLOROCYCLOPENTADIENE								
HEXACHLOROETHANE								
INDENO(1,2,3-CD)PYRENE								
ISOPHORONE								
N-NITROSO-DI-N-PROPYLAMINE								
N-NITROSODIPHENYLAMINE								
NAPHTHALENE								
NITROBENZENE								
PENTACHLOROPHENOL								
PHENANTHRENE								
PHENOL								
PYRENE								
Pesticides/PCBs (ug/kg)								
4,4'-DDD								
4,4'-DDE								
4,4'-DDT								
ALDRIN								
ALPHA-BHC								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB018	S57SB018	S57SB018	S57SB018	S57SB018	S57SB019	S57SB019	S57SB019
Sample ID	S57SS0180103-D	S57SB0180103	S57SB0180203	S57SB0180303	S57SB0180403	S57SS0190103	S57SB0190103	S57SB0190203
Depth Range	0 - 0.5	4 - 5	8 - 10	16 - 18	18 - 20	0 - 0.5	4 - 5	8 - 10
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
ALPHA-CHLORDANE								
AROCLOR-1016								
AROCLOR-1221								
AROCLOR-1232								
AROCLOR-1242								
AROCLOR-1248								
AROCLOR-1254								
AROCLOR-1260								
BETA-BHC								
DELTA-BHC								
DIELDRIN								
ENDOSULFAN I								
ENDOSULFAN II								
ENDOSULFAN SULFATE								
ENDRIN								
ENDRIN ALDEHYDE								
ENDRIN KETONE								
GAMMA-BHC (LINDANE)								
GAMMA-CHLORDANE								
HEPTACHLOR								
HEPTACHLOR EPOXIDE								
METHOXYCHLOR								
TOXAPHENE								
Explosives (ug/kg)								
1,3-DINITROBENZENE								
2,4,6-TRINITROTOLUENE								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								
2-AMINO-4,6-DINITROTOLUENE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB018	S57SB018	S57SB018	S57SB018	S57SB018	S57SB019	S57SB019	S57SB019
Sample ID	S57SS0180103-D	S57SB0180103	S57SB0180203	S57SB0180303	S57SB0180403	S57SS0190103	S57SB0190103	S57SB0190203
Depth Range	0 - 0.5	4 - 5	8 - 10	16 - 18	18 - 20	0 - 0.5	4 - 5	8 - 10
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
2-NITROTOLUENE								
3-NITROTOLUENE								
4-AMINO-2,6-DINITROTOLUENE								
4-NITROTOLUENE								
HMX								
NITROBENZENE								
NITROCELLULOSE								
NITROGLYCERIN								
NITROGUANIDINE								
RDX								
TETRYL								
Inorganics (mg/kg)								
ALUMINUM								
ANTIMONY								
ARSENIC	22.6	2.3						
BARIUM								
BERYLLIUM								
CADMIUM								
CALCIUM								
CHROMIUM								
COBALT								
COPPER								
IRON								
LEAD								
MAGNESIUM								
MANGANESE								
MERCURY								
NICKEL								
POTASSIUM								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB018	S57SB018	S57SB018	S57SB018	S57SB018	S57SB019	S57SB019	S57SB019
Sample ID	S57SS0180103-D	S57SB0180103	S57SB0180203	S57SB0180303	S57SB0180403	S57SS0190103	S57SB0190103	S57SB0190203
Depth Range	0 - 0.5	4 - 5	8 - 10	16 - 18	18 - 20	0 - 0.5	4 - 5	8 - 10
Sample Date	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001	8/23/2001
SELENIUM								
SILVER								
SODIUM								
THALLIUM								
VANADIUM								
ZINC								
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)		420 J		64 J				
PH (MEQ/1)		5.48		5.91				
PH (S.U.)								
TOTAL ORGANIC CARBON (MG/KG)								
TOTAL SOLIDS (%)								
Field Parameters								
BULK DENSITY (PCF)		122.3		111.7				
POROSITY (%)		41.9		37.2				
SIEVE 1" (%)		100						
SIEVE 1-1/2" (%)								
SIEVE 1/2" (%)		95.7						
SIEVE 3/4" (%)		100						
SIEVE 3/8" (%)		92.2		100				
SIEVE NO. 004 (%)		79.1		99.5				
SIEVE NO. 010 (%)		69.6		98				
SIEVE NO. 020 (%)		65		76.7				
SIEVE NO. 040 (%)		59.4		41.6				
SIEVE NO. 100 (%)		50.6		25				
SIEVE NO. 200 (%)		46.4		22.2				
SPECIFIC GRAVITY (S.U.)		2.58		2.61				

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB019	S57SB019	S57SB020	S57SB020	S57SB021	S57SB021	S57SB021	S57SB021
Sample ID	S57SB0190303	S57SB0190403	S57SS0200103	S57SB0200103	S57SS0210103	S57SB0210103	S57SB0210203	S57SB0210203-D
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	0 - 0.5	4 - 5	8 - 10	8 - 10
Sample Date	8/23/2001	8/23/2001	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
1,1,2,2-TETRACHLOROETHANE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
1,1,2-TRICHLOROETHANE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
1,1,2-TRICHLOROTRIFLUOROETHANE	5.9 U	5.8 U						
1,1-DICHLOROETHANE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
1,1-DICHLOROETHENE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
1,2-DICHLOROETHANE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
1,2-DICHLOROPROPANE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
2-BUTANONE	5.9 U	5.8 U			5.4 U	25	6.9 U	6.6 U
2-HEXANONE	5.9 U	5.8 U			5.4 U	23	6.9 U	6.6 U
4-METHYL-2-PENTANONE	5.9 U	5.8 U			5.4 U	16	6.9 U	6.6 U
ACETONE	2400	5.8 U			16 B	30 B	43 B	34 B
BENZENE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
BROMODICHLOROMETHANE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
BROMOFORM	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
BROMOMETHANE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
CARBON DISULFIDE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
CARBON TETRACHLORIDE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
CHLOROBENZENE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
CHLORODIBROMOMETHANE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
CHLOROETHANE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
CHLOROFORM	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
CHLOROMETHANE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
CIS-1,2-DICHLOROETHENE	22	5.8 U			16	16	690	240
CIS-1,3-DICHLOROPROPENE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
CYCLOHEXANE	5.9 U	5.8 U						
DIETHYL ETHER	10	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
ETHYLBENZENE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB019	S57SB019	S57SB020	S57SB020	S57SB021	S57SB021	S57SB021	S57SB021
Sample ID	S57SB0190303	S57SB0190403	S57SS0200103	S57SB0200103	S57SS0210103	S57SB0210103	S57SB0210203	S57SB0210203-D
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	0 - 0.5	4 - 5	8 - 10	8 - 10
Sample Date	8/23/2001	8/23/2001	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001
ISOPROPYLBENZENE	5.9 U	5.8 U						
M+P-XYLENES	5.9 U	5.8 U			5.4 U	3.1 J	6.9 U	6.6 U
METHYL ACETATE	5.9 U	5.8 U						
METHYL CYCLOHEXANE	5.9 U	5.8 U						
METHYL TERT-BUTYL ETHER	5.9 U	5.8 U						
METHYLENE CHLORIDE	7.1 B	5.4 B			9.9 B	17 B	22 B	18 B
O-XYLENE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
STYRENE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
TETRACHLOROETHENE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
TOLUENE	5.9 U	5.8 U			5.4 U	3.2 J	6.9 U	6.6 U
TOTAL XYLENES								
TRANS-1,2-DICHLOROETHENE	5.9 U	5.8 U			5.4 U	6.2 U	5.9 J	6.6 U
TRANS-1,3-DICHLOROPROPENE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
TRICHLOROETHENE	45	5.8 U			53	82	98	41
VINYL CHLORIDE	5.9 U	5.8 U			5.4 U	6.2 U	6.9 U	6.6 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE								
1,2-DICHLOROBENZENE								
1,3,5-TRINITROBENZENE								
1,3-DICHLOROBENZENE								
1,4-DICHLOROBENZENE								
2,2'-OXYBIS(1-CHLOROPROPANE)								
2,4,5-TRICHLOROPHENOL								
2,4,6-TRICHLOROPHENOL								
2,4-DICHLOROPHENOL								
2,4-DIMETHYLPHENOL								
2,4-DINITROPHENOL								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB019	S57SB019	S57SB020	S57SB020	S57SB021	S57SB021	S57SB021	S57SB021
Sample ID	S57SB0190303	S57SB0190403	S57SS0200103	S57SB0200103	S57SS0210103	S57SB0210103	S57SB0210203	S57SB0210203-D
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	0 - 0.5	4 - 5	8 - 10	8 - 10
Sample Date	8/23/2001	8/23/2001	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001
2-CHLORONAPHTHALENE								
2-CHLOROPHENOL								
2-METHYLNAPHTHALENE								
2-METHYLPHENOL								
2-NITROANILINE								
2-NITROPHENOL								
3,3'-DICHLOROBENZIDINE								
3-NITROANILINE								
4,6-DINITRO-2-METHYLPHENOL								
4-BROMOPHENYL PHENYL ETHER								
4-CHLORO-3-METHYLPHENOL								
4-CHLOROANILINE								
4-CHLOROPHENYL PHENYL ETHER								
4-METHYLPHENOL								
4-NITROANILINE								
4-NITROPHENOL								
ACENAPHTHENE								
ACENAPHTHYLENE								
ANTHRACENE								
BENZO(A)ANTHRACENE								
BENZO(A)PYRENE								
BENZO(B)FLUORANTHENE								
BENZO(G,H,I)PERYLENE								
BENZO(K)FLUORANTHENE								
BIS(2-CHLOROETHOXY)METHANE								
BIS(2-CHLOROETHYL)ETHER								
BIS(2-ETHYLHEXYL)PHTHALATE								
BUTYL BENZYL PHTHALATE								
CARBAZOLE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB019	S57SB019	S57SB020	S57SB020	S57SB021	S57SB021	S57SB021	S57SB021
Sample ID	S57SB0190303	S57SB0190403	S57SS0200103	S57SB0200103	S57SS0210103	S57SB0210103	S57SB0210203	S57SB0210203-D
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	0 - 0.5	4 - 5	8 - 10	8 - 10
Sample Date	8/23/2001	8/23/2001	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001
CHRYSENE								
DI-N-BUTYL PHTHALATE								
DI-N-OCTYL PHTHALATE								
DIBENZO(A,H)ANTHRACENE								
DIBENZOFURAN								
DIETHYL PHTHALATE								
DIMETHYL PHTHALATE								
FLUORANTHENE								
FLUORENE								
HEXACHLOROBENZENE								
HEXACHLOROBUTADIENE								
HEXACHLOROCYCLOPENTADIENE								
HEXACHLOROETHANE								
INDENO(1,2,3-CD)PYRENE								
ISOPHORONE								
N-NITROSO-DI-N-PROPYLAMINE								
N-NITROSODIPHENYLAMINE								
NAPHTHALENE								
NITROBENZENE								
PENTACHLOROPHENOL								
PHENANTHRENE								
PHENOL								
PYRENE								
Pesticides/PCBs (ug/kg)								
4,4'-DDD								
4,4'-DDE								
4,4'-DDT								
ALDRIN								
ALPHA-BHC								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB019	S57SB019	S57SB020	S57SB020	S57SB021	S57SB021	S57SB021	S57SB021
Sample ID	S57SB0190303	S57SB0190403	S57SS0200103	S57SB0200103	S57SS0210103	S57SB0210103	S57SB0210203	S57SB0210203-D
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	0 - 0.5	4 - 5	8 - 10	8 - 10
Sample Date	8/23/2001	8/23/2001	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001
ALPHA-CHLORDANE								
AROCLOR-1016								
AROCLOR-1221								
AROCLOR-1232								
AROCLOR-1242								
AROCLOR-1248								
AROCLOR-1254								
AROCLOR-1260								
BETA-BHC								
DELTA-BHC								
DIELDRIN								
ENDOSULFAN I								
ENDOSULFAN II								
ENDOSULFAN SULFATE								
ENDRIN								
ENDRIN ALDEHYDE								
ENDRIN KETONE								
GAMMA-BHC (LINDANE)								
GAMMA-CHLORDANE								
HEPTACHLOR								
HEPTACHLOR EPOXIDE								
METHOXYCHLOR								
TOXAPHENE								
Explosives (ug/kg)								
1,3-DINITROBENZENE								
2,4,6-TRINITROTOLUENE								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								
2-AMINO-4,6-DINITROTOLUENE								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB019	S57SB019	S57SB020	S57SB020	S57SB021	S57SB021	S57SB021	S57SB021
Sample ID	S57SB0190303	S57SB0190403	S57SS0200103	S57SB0200103	S57SS0210103	S57SB0210103	S57SB0210203	S57SB0210203-D
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	0 - 0.5	4 - 5	8 - 10	8 - 10
Sample Date	8/23/2001	8/23/2001	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001
2-NITROTOLUENE								
3-NITROTOLUENE								
4-AMINO-2,6-DINITROTOLUENE								
4-NITROTOLUENE								
HMX								
NITROBENZENE								
NITROCELLULOSE								
NITROGLYCERIN								
NITROGUANIDINE								
RDX								
TETRYL								
Inorganics (mg/kg)								
ALUMINUM								
ANTIMONY								
ARSENIC			33.6	3.3	79.9			
BARIUM								
BERYLLIUM								
CADMIUM								
CALCIUM								
CHROMIUM								
COBALT								
COPPER								
IRON								
LEAD								
MAGNESIUM								
MANGANESE								
MERCURY								
NICKEL								
POTASSIUM								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB019	S57SB019	S57SB020	S57SB020	S57SB021	S57SB021	S57SB021	S57SB021
Sample ID	S57SB0190303	S57SB0190403	S57SS0200103	S57SB0200103	S57SS0210103	S57SB0210103	S57SB0210203	S57SB0210203-D
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	0 - 0.5	4 - 5	8 - 10	8 - 10
Sample Date	8/23/2001	8/23/2001	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001
SELENIUM								
SILVER								
SODIUM								
THALLIUM								
VANADIUM								
ZINC								
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)								
PH (MEQ/1)								
PH (S.U.)								
TOTAL ORGANIC CARBON (MG/KG)								
TOTAL SOLIDS (%)								
Field Parameters								
BULK DENSITY (PCF)						112.9		
POROSITY (%)						45.9		
SIEVE 1" (%)								
SIEVE 1-1/2" (%)								
SIEVE 1/2" (%)								
SIEVE 3/4" (%)								
SIEVE 3/8" (%)						100		
SIEVE NO. 004 (%)						97.1		
SIEVE NO. 010 (%)						88.2		
SIEVE NO. 020 (%)						86		
SIEVE NO. 040 (%)						82.9		
SIEVE NO. 100 (%)						76.9		
SIEVE NO. 200 (%)						66.7		
SPECIFIC GRAVITY (S.U.)						2.59		

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB021	S57SB021	S57SB022	S57SB022	S57SB022	S57SB022	S57SB022	S57SB023
Sample ID	S57SB0210303	S57SB0210403	S57SS0220103	S57SB0220103	S57SB0220203	S57SB0220303	S57SB0220403	S57SS0230103
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	8 - 10	12 - 14	18 - 20	0 - 0.5
Sample Date	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/14/2001
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
1,1,2,2-TETRACHLOROETHANE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
1,1,2-TRICHLOROETHANE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
1,1,2-TRICHLOROTRIFLUOROETHANE	6.5 U	6.1 U					6.8 U	
1,1-DICHLOROETHANE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
1,1-DICHLOROETHENE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
1,2-DICHLOROETHANE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
1,2-DICHLOROPROPANE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
2-BUTANONE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
2-HEXANONE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
4-METHYL-2-PENTANONE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
ACETONE	19 B	18 B	14 B	14 B	16 B	18 B	12 B	25 B
BENZENE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
BROMODICHLOROMETHANE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
BROMOFORM	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
BROMOMETHANE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
CARBON DISULFIDE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
CARBON TETRACHLORIDE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
CHLOROBENZENE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
CHLORODIBROMOMETHANE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
CHLOROETHANE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
CHLOROFORM	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
CHLOROMETHANE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
CIS-1,2-DICHLOROETHENE	6.5 U	6.1 U	14	15	34	6.4 U	6.8 U	3.9 J
CIS-1,3-DICHLOROPROPENE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
CYCLOHEXANE	6.5 U	6.1 U					6.8 U	
DIETHYL ETHER	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	13	5.8 U
ETHYLBENZENE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB021	S57SB021	S57SB022	S57SB022	S57SB022	S57SB022	S57SB022	S57SB023
Sample ID	S57SB0210303	S57SB0210403	S57SS0220103	S57SB0220103	S57SB0220203	S57SB0220303	S57SB0220403	S57SS0230103
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	8 - 10	12 - 14	18 - 20	0 - 0.5
Sample Date	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/14/2001
ISOPROPYLBENZENE	6.5 U	6.1 U					6.8 U	
M+P-XYLENES	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
METHYL ACETATE	6.5 U	6.1 U					6.8 U	
METHYL CYCLOHEXANE	6.5 U	6.1 U					6.8 U	
METHYL TERT-BUTYL ETHER	6.5 U	6.1 U					6.8 U	
METHYLENE CHLORIDE	13 B	16 B	5.6 U	5.2 B	4.1 B	4.7 B	14 B	5.8 B
O-XYLENE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
STYRENE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
TETRACHLOROETHENE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
TOLUENE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
TOTAL XYLENES								
TRANS-1,2-DICHLOROETHENE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
TRANS-1,3-DICHLOROPROPENE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
TRICHLOROETHENE	6.5 U	6.1 U	21	7.5	43	6.4 U	6.8 U	20
VINYL CHLORIDE	6.5 U	6.1 U	5.6 U	6 U	5.6 U	6.4 U	6.8 U	5.8 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE								
1,2-DICHLOROBENZENE								
1,3,5-TRINITROBENZENE								
1,3-DICHLOROBENZENE								
1,4-DICHLOROBENZENE								
2,2'-OXYBIS(1-CHLOROPROPANE)								
2,4,5-TRICHLOROPHENOL								
2,4,6-TRICHLOROPHENOL								
2,4-DICHLOROPHENOL								
2,4-DIMETHYLPHENOL								
2,4-DINITROPHENOL								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round Location Sample ID Depth Range Sample Date	2001Q3 S57SB021 S57SB0210303 14 - 16 8/15/2001	2001Q3 S57SB021 S57SB0210403 18 - 20 8/15/2001	2001Q3 S57SB022 S57SS0220103 0 - 0.5 8/14/2001	2001Q3 S57SB022 S57SB0220103 4 - 5 8/14/2001	2001Q3 S57SB022 S57SB0220203 8 - 10 8/14/2001	2001Q3 S57SB022 S57SB0220303 12 - 14 8/14/2001	2001Q3 S57SB022 S57SB0220403 18 - 20 8/15/2001	2001Q3 S57SB023 S57SS0230103 0 - 0.5 8/14/2001
2-CHLORONAPHTHALENE								
2-CHLOROPHENOL								
2-METHYLNAPHTHALENE								
2-METHYLPHENOL								
2-NITROANILINE								
2-NITROPHENOL								
3,3'-DICHLOROBENZIDINE								
3-NITROANILINE								
4,6-DINITRO-2-METHYLPHENOL								
4-BROMOPHENYL PHENYL ETHER								
4-CHLORO-3-METHYLPHENOL								
4-CHLOROANILINE								
4-CHLOROPHENYL PHENYL ETHER								
4-METHYLPHENOL								
4-NITROANILINE								
4-NITROPHENOL								
ACENAPHTHENE								
ACENAPHTHYLENE								
ANTHRACENE								
BENZO(A)ANTHRACENE								
BENZO(A)PYRENE								
BENZO(B)FLUORANTHENE								
BENZO(G,H,I)PERYLENE								
BENZO(K)FLUORANTHENE								
BIS(2-CHLOROETHOXY)METHANE								
BIS(2-CHLOROETHYL)ETHER								
BIS(2-ETHYLHEXYL)PHTHALATE								
BUTYL BENZYL PHTHALATE								
CARBAZOLE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB021	S57SB021	S57SB022	S57SB022	S57SB022	S57SB022	S57SB022	S57SB023
Sample ID	S57SB0210303	S57SB0210403	S57SS0220103	S57SB0220103	S57SB0220203	S57SB0220303	S57SB0220403	S57SS0230103
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	8 - 10	12 - 14	18 - 20	0 - 0.5
Sample Date	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/14/2001
CHRYSENE								
DI-N-BUTYL PHTHALATE								
DI-N-OCTYL PHTHALATE								
DIBENZO(A,H)ANTHRACENE								
DIBENZOFURAN								
DIETHYL PHTHALATE								
DIMETHYL PHTHALATE								
FLUORANTHENE								
FLUORENE								
HEXACHLOROBENZENE								
HEXACHLOROBUTADIENE								
HEXACHLOROCYCLOPENTADIENE								
HEXACHLOROETHANE								
INDENO(1,2,3-CD)PYRENE								
ISOPHORONE								
N-NITROSO-DI-N-PROPYLAMINE								
N-NITROSODIPHENYLAMINE								
NAPHTHALENE								
NITROBENZENE								
PENTACHLOROPHENOL								
PHENANTHRENE								
PHENOL								
PYRENE								
Pesticides/PCBs (ug/kg)								
4,4'-DDD								
4,4'-DDE								
4,4'-DDT								
ALDRIN								
ALPHA-BHC								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB021	S57SB021	S57SB022	S57SB022	S57SB022	S57SB022	S57SB022	S57SB023
Sample ID	S57SB0210303	S57SB0210403	S57SS0220103	S57SB0220103	S57SB0220203	S57SB0220303	S57SB0220403	S57SS0230103
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	8 - 10	12 - 14	18 - 20	0 - 0.5
Sample Date	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/14/2001
ALPHA-CHLORDANE								
AROCLOR-1016								
AROCLOR-1221								
AROCLOR-1232								
AROCLOR-1242								
AROCLOR-1248								
AROCLOR-1254								
AROCLOR-1260								
BETA-BHC								
DELTA-BHC								
DIELDRIN								
ENDOSULFAN I								
ENDOSULFAN II								
ENDOSULFAN SULFATE								
ENDRIN								
ENDRIN ALDEHYDE								
ENDRIN KETONE								
GAMMA-BHC (LINDANE)								
GAMMA-CHLORDANE								
HEPTACHLOR								
HEPTACHLOR EPOXIDE								
METHOXYCHLOR								
TOXAPHENE								
Explosives (ug/kg)								
1,3-DINITROBENZENE								
2,4,6-TRINITROTOLUENE								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								
2-AMINO-4,6-DINITROTOLUENE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB021	S57SB021	S57SB022	S57SB022	S57SB022	S57SB022	S57SB022	S57SB023
Sample ID	S57SB0210303	S57SB0210403	S57SS0220103	S57SB0220103	S57SB0220203	S57SB0220303	S57SB0220403	S57SS0230103
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	8 - 10	12 - 14	18 - 20	0 - 0.5
Sample Date	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/14/2001
2-NITROTOLUENE								
3-NITROTOLUENE								
4-AMINO-2,6-DINITROTOLUENE								
4-NITROTOLUENE								
HMX								
NITROBENZENE								
NITROCELLULOSE								
NITROGLYCERIN								
NITROGUANIDINE								
RDX								
TETRYL								
Inorganics (mg/kg)								
ALUMINUM								
ANTIMONY								
ARSENIC			2.7					
BARIUM								
BERYLLIUM								
CADMIUM								
CALCIUM								
CHROMIUM								
COBALT								
COPPER								
IRON								
LEAD								
MAGNESIUM								
MANGANESE								
MERCURY								
NICKEL								
POTASSIUM								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB021	S57SB021	S57SB022	S57SB022	S57SB022	S57SB022	S57SB022	S57SB023
Sample ID	S57SB0210303	S57SB0210403	S57SS0220103	S57SB0220103	S57SB0220203	S57SB0220303	S57SB0220403	S57SS0230103
Depth Range	14 - 16	18 - 20	0 - 0.5	4 - 5	8 - 10	12 - 14	18 - 20	0 - 0.5
Sample Date	8/15/2001	8/15/2001	8/14/2001	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/14/2001
SELENIUM								
SILVER								
SODIUM								
THALLIUM								
VANADIUM								
ZINC								
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)	38			290		17		
PH (MEQ/1)	5.54			4.95		5.17		
PH (S.U.)								
TOTAL ORGANIC CARBON (MG/KG)	28000			30000		20000		
TOTAL SOLIDS (%)								
Field Parameters								
BULK DENSITY (PCF)	122.9			127.3		132.9		
POROSITY (%)	36.7			32.9		30.1		
SIEVE 1" (%)						92.8		
SIEVE 1-1/2" (%)						100		
SIEVE 1/2" (%)				95.8		65.4		
SIEVE 3/4" (%)				100		77.4		
SIEVE 3/8" (%)	100			88.8		62		
SIEVE NO. 004 (%)	99.2			73.7		54.3		
SIEVE NO. 010 (%)	95.7			46.7		44.7		
SIEVE NO. 020 (%)	74.1			42.3		29.8		
SIEVE NO. 040 (%)	27.8			33.3		16.5		
SIEVE NO. 100 (%)	12.4			23.1		6.9		
SIEVE NO. 200 (%)	9.8					5.3		
SPECIFIC GRAVITY (S.U.)	2.65			2.57		2.63		

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB023	S57SB023	S57SB023	S57SB024	S57SB024	S57SB024	S57SB025	S57SB025
Sample ID	S57SB0230103	S57SB0230203	S57SB0230303	S57SS0240103	S57SB0240103	S57SB0240203	S57SS0250103	S57SB0250103
Depth Range	4 - 5	8 - 10	12 - 14	0 - 0.5	4 - 5	8 - 10	0 - 0.5	4 - 5
Sample Date	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
1,1,2,2-TETRACHLOROETHANE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
1,1,2-TRICHLOROETHANE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
1,1,2-TRICHLOROTRIFLUOROETHANE								6.2 U
1,1-DICHLOROETHANE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
1,1-DICHLOROETHENE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
1,2-DICHLOROETHANE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
1,2-DICHLOROPROPANE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
2-BUTANONE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
2-HEXANONE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
4-METHYL-2-PENTANONE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
ACETONE	22 B	18 B	18 B	20 B	26 B	23 B	18 B	19 B
BENZENE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
BROMODICHLOROMETHANE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
BROMOFORM	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
BROMOMETHANE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
CARBON DISULFIDE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
CARBON TETRACHLORIDE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
CHLOROBENZENE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
CHLORODIBROMOMETHANE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
CHLOROETHANE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
CHLOROFORM	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
CHLOROMETHANE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
CIS-1,2-DICHLOROETHENE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
CIS-1,3-DICHLOROPROPENE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
CYCLOHEXANE								6.2 U
DIETHYL ETHER	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
ETHYLBENZENE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	9.6	6.2 U

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB023	S57SB023	S57SB023	S57SB024	S57SB024	S57SB024	S57SB025	S57SB025
Sample ID	S57SB0230103	S57SB0230203	S57SB0230303	S57SS0240103	S57SB0240103	S57SB0240203	S57SS0250103	S57SB0250103
Depth Range	4 - 5	8 - 10	12 - 14	0 - 0.5	4 - 5	8 - 10	0 - 0.5	4 - 5
Sample Date	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001
ISOPROPYLBENZENE								6.2 U
M+P-XYLENES	6.1 U	6 U	5.8 U	2.8 J	5.7 U	5.7 U	35	6.2 U
METHYL ACETATE								6.2 U
METHYL CYCLOHEXANE								6.2 U
METHYL TERT-BUTYL ETHER								6.2 U
METHYLENE CHLORIDE	4.7 B	5.2 B	13 B	13 B	13 B	15 B	11 B	15 B
O-XYLENE	6.1 U	6 U	5.8 U	3 J	5.7 U	5.7 U	22	6.2 U
STYRENE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
TETRACHLOROETHENE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
TOLUENE	6.1 U	3.7 J	5.8 U	5.5 U	5.7 U	5.7 U	5.2 J	6.2 U
TOTAL XYLENES								
TRANS-1,2-DICHLOROETHENE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
TRANS-1,3-DICHLOROPROPENE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
TRICHLOROETHENE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	8	6.2 U
VINYL CHLORIDE	6.1 U	6 U	5.8 U	5.5 U	5.7 U	5.7 U	5.5 U	6.2 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE								
1,2-DICHLOROBENZENE								
1,3,5-TRINITROBENZENE								
1,3-DICHLOROBENZENE								
1,4-DICHLOROBENZENE								
2,2'-OXYBIS(1-CHLOROPROPANE)								
2,4,5-TRICHLOROPHENOL								
2,4,6-TRICHLOROPHENOL								
2,4-DICHLOROPHENOL								
2,4-DIMETHYLPHENOL								
2,4-DINITROPHENOL								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB023	S57SB023	S57SB023	S57SB024	S57SB024	S57SB024	S57SB025	S57SB025
Sample ID	S57SB0230103	S57SB0230203	S57SB0230303	S57SS0240103	S57SB0240103	S57SB0240203	S57SS0250103	S57SB0250103
Depth Range	4 - 5	8 - 10	12 - 14	0 - 0.5	4 - 5	8 - 10	0 - 0.5	4 - 5
Sample Date	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001
2-CHLORONAPHTHALENE								
2-CHLOROPHENOL								
2-METHYLNAPHTHALENE								
2-METHYLPHENOL								
2-NITROANILINE								
2-NITROPHENOL								
3,3'-DICHLOROBENZIDINE								
3-NITROANILINE								
4,6-DINITRO-2-METHYLPHENOL								
4-BROMOPHENYL PHENYL ETHER								
4-CHLORO-3-METHYLPHENOL								
4-CHLOROANILINE								
4-CHLOROPHENYL PHENYL ETHER								
4-METHYLPHENOL								
4-NITROANILINE								
4-NITROPHENOL								
ACENAPHTHENE								
ACENAPHTHYLENE								
ANTHRACENE								
BENZO(A)ANTHRACENE								
BENZO(A)PYRENE								
BENZO(B)FLUORANTHENE								
BENZO(G,H,I)PERYLENE								
BENZO(K)FLUORANTHENE								
BIS(2-CHLOROETHOXY)METHANE								
BIS(2-CHLOROETHYL)ETHER								
BIS(2-ETHYLHEXYL)PHTHALATE								
BUTYL BENZYL PHTHALATE								
CARBAZOLE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB023	S57SB023	S57SB023	S57SB024	S57SB024	S57SB024	S57SB025	S57SB025
Sample ID	S57SB0230103	S57SB0230203	S57SB0230303	S57SS0240103	S57SB0240103	S57SB0240203	S57SS0250103	S57SB0250103
Depth Range	4 - 5	8 - 10	12 - 14	0 - 0.5	4 - 5	8 - 10	0 - 0.5	4 - 5
Sample Date	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001
CHRYSENE								
DI-N-BUTYL PHTHALATE								
DI-N-OCTYL PHTHALATE								
DIBENZO(A,H)ANTHRACENE								
DIBENZOFURAN								
DIETHYL PHTHALATE								
DIMETHYL PHTHALATE								
FLUORANTHENE								
FLUORENE								
HEXACHLOROBENZENE								
HEXACHLOROBUTADIENE								
HEXACHLOROCYCLOPENTADIENE								
HEXACHLOROETHANE								
INDENO(1,2,3-CD)PYRENE								
ISOPHORONE								
N-NITROSO-DI-N-PROPYLAMINE								
N-NITROSODIPHENYLAMINE								
NAPHTHALENE								
NITROBENZENE								
PENTACHLOROPHENOL								
PHENANTHRENE								
PHENOL								
PYRENE								
Pesticides/PCBs (ug/kg)								
4,4'-DDD								
4,4'-DDE								
4,4'-DDT								
ALDRIN								
ALPHA-BHC								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB023	S57SB023	S57SB023	S57SB024	S57SB024	S57SB024	S57SB025	S57SB025
Sample ID	S57SB0230103	S57SB0230203	S57SB0230303	S57SS0240103	S57SB0240103	S57SB0240203	S57SS0250103	S57SB0250103
Depth Range	4 - 5	8 - 10	12 - 14	0 - 0.5	4 - 5	8 - 10	0 - 0.5	4 - 5
Sample Date	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001
ALPHA-CHLORDANE								
AROCLOR-1016								
AROCLOR-1221								
AROCLOR-1232								
AROCLOR-1242								
AROCLOR-1248								
AROCLOR-1254								
AROCLOR-1260								
BETA-BHC								
DELTA-BHC								
DIELDRIN								
ENDOSULFAN I								
ENDOSULFAN II								
ENDOSULFAN SULFATE								
ENDRIN								
ENDRIN ALDEHYDE								
ENDRIN KETONE								
GAMMA-BHC (LINDANE)								
GAMMA-CHLORDANE								
HEPTACHLOR								
HEPTACHLOR EPOXIDE								
METHOXYCHLOR								
TOXAPHENE								
Explosives (ug/kg)								
1,3-DINITROBENZENE								
2,4,6-TRINITROTOLUENE								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								
2-AMINO-4,6-DINITROTOLUENE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB023	S57SB023	S57SB023	S57SB024	S57SB024	S57SB024	S57SB025	S57SB025
Sample ID	S57SB0230103	S57SB0230203	S57SB0230303	S57SS0240103	S57SB0240103	S57SB0240203	S57SS0250103	S57SB0250103
Depth Range	4 - 5	8 - 10	12 - 14	0 - 0.5	4 - 5	8 - 10	0 - 0.5	4 - 5
Sample Date	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001
2-NITROTOLUENE								
3-NITROTOLUENE								
4-AMINO-2,6-DINITROTOLUENE								
4-NITROTOLUENE								
HMX								
NITROBENZENE								
NITROCELLULOSE								
NITROGLYCERIN								
NITROGUANIDINE								
RDX								
TETRYL								
Inorganics (mg/kg)								
ALUMINUM								
ANTIMONY								
ARSENIC								
BARIUM								
BERYLLIUM								
CADMIUM								
CALCIUM								
CHROMIUM								
COBALT								
COPPER								
IRON								
LEAD								
MAGNESIUM								
MANGANESE								
MERCURY								
NICKEL								
POTASSIUM								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB023	S57SB023	S57SB023	S57SB024	S57SB024	S57SB024	S57SB025	S57SB025
Sample ID	S57SB0230103	S57SB0230203	S57SB0230303	S57SS0240103	S57SB0240103	S57SB0240203	S57SS0250103	S57SB0250103
Depth Range	4 - 5	8 - 10	12 - 14	0 - 0.5	4 - 5	8 - 10	0 - 0.5	4 - 5
Sample Date	8/14/2001	8/14/2001	8/14/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001	8/15/2001
SELENIUM								
SILVER								
SODIUM								
THALLIUM								
VANADIUM								
ZINC								
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)					210			
PH (MEQ/1)					5.01			
PH (S.U.)								
TOTAL ORGANIC CARBON (MG/KG)					23000			
TOTAL SOLIDS (%)								
Field Parameters								
BULK DENSITY (PCF)					134.8			
POROSITY (%)					30.4			
SIEVE 1" (%)								
SIEVE 1-1/2" (%)								
SIEVE 1/2" (%)					100			
SIEVE 3/4" (%)								
SIEVE 3/8" (%)					92.8			
SIEVE NO. 004 (%)					89.6			
SIEVE NO. 010 (%)					86.7			
SIEVE NO. 020 (%)					85.3			
SIEVE NO. 040 (%)					82.4			
SIEVE NO. 100 (%)					63.6			
SIEVE NO. 200 (%)					54.9			
SPECIFIC GRAVITY (S.U.)					2.62			

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB025	S57SB025	S57SB026	S57SB027	S57SB027	S57SB027	S57SB027	S57SB027
Sample ID	S57SB0250203	S57SB0250303	S57SB0260103	S57SS0270103	S57SB0270103	S57SB0270203	S57SB0270303	S57SB0270403
Depth Range	8 - 10	12 - 14	8 - 9	0 - 0.5	4 - 5	8 - 10	12 - 14	16 - 18
Sample Date	8/15/2001	8/15/2001	8/15/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
1,1,2,2-TETRACHLOROETHANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
1,1,2-TRICHLOROETHANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
1,1,2-TRICHLOROTRIFLUOROETHANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
1,1-DICHLOROETHANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
1,1-DICHLOROETHENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
1,2-DICHLOROETHANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
1,2-DICHLOROPROPANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
2-BUTANONE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
2-HEXANONE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
4-METHYL-2-PENTANONE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
ACETONE	20 B	19 B		19 B	14 B	81 B	42 B	97 B
BENZENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
BROMODICHLOROMETHANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
BROMOFORM	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
BROMOMETHANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
CARBON DISULFIDE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
CARBON TETRACHLORIDE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
CHLOROBENZENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
CHLORODIBROMOMETHANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
CHLOROETHANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
CHLOROFORM	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
CHLOROMETHANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
CIS-1,2-DICHLOROETHENE	11	4.7 J		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
CIS-1,3-DICHLOROPROPENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
CYCLOHEXANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
DIETHYL ETHER	17	18		5.8 U	6.1 U	2100	750	230
ETHYLBENZENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB025	S57SB025	S57SB026	S57SB027	S57SB027	S57SB027	S57SB027	S57SB027
Sample ID	S57SB0250203	S57SB0250303	S57SB0260103	S57SS0270103	S57SB0270103	S57SB0270203	S57SB0270303	S57SB0270403
Depth Range	8 - 10	12 - 14	8 - 9	0 - 0.5	4 - 5	8 - 10	12 - 14	16 - 18
Sample Date	8/15/2001	8/15/2001	8/15/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001
ISOPROPYLBENZENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
M+P-XYLENES	5.9 U	2.6 J		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
METHYL ACETATE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
METHYL CYCLOHEXANE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
METHYL TERT-BUTYL ETHER	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
METHYLENE CHLORIDE	17 B	14 B		7.6 B	8.5 B	9.8 B	8 B	9.1 B
O-XYLENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
STYRENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
TETRACHLOROETHENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
TOLUENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
TOTAL XYLENES								
TRANS-1,2-DICHLOROETHENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
TRANS-1,3-DICHLOROPROPENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
TRICHLOROETHENE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
VINYL CHLORIDE	5.9 U	6 U		5.8 U	6.1 U	6.5 U	6.4 U	6.5 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE								
1,2-DICHLOROBENZENE								
1,3,5-TRINITROBENZENE								
1,3-DICHLOROBENZENE								
1,4-DICHLOROBENZENE								
2,2'-OXYBIS(1-CHLOROPROPANE)								
2,4,5-TRICHLOROPHENOL								
2,4,6-TRICHLOROPHENOL								
2,4-DICHLOROPHENOL								
2,4-DIMETHYLPHENOL								
2,4-DINITROPHENOL								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB025	S57SB025	S57SB026	S57SB027	S57SB027	S57SB027	S57SB027	S57SB027
Sample ID	S57SB0250203	S57SB0250303	S57SB0260103	S57SS0270103	S57SB0270103	S57SB0270203	S57SB0270303	S57SB0270403
Depth Range	8 - 10	12 - 14	8 - 9	0 - 0.5	4 - 5	8 - 10	12 - 14	16 - 18
Sample Date	8/15/2001	8/15/2001	8/15/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001
2-CHLORONAPHTHALENE								
2-CHLOROPHENOL								
2-METHYLNAPHTHALENE								
2-METHYLPHENOL								
2-NITROANILINE								
2-NITROPHENOL								
3,3'-DICHLOROBENZIDINE								
3-NITROANILINE								
4,6-DINITRO-2-METHYLPHENOL								
4-BROMOPHENYL PHENYL ETHER								
4-CHLORO-3-METHYLPHENOL								
4-CHLOROANILINE								
4-CHLOROPHENYL PHENYL ETHER								
4-METHYLPHENOL								
4-NITROANILINE								
4-NITROPHENOL								
ACENAPHTHENE								
ACENAPHTHYLENE								
ANTHRACENE								
BENZO(A)ANTHRACENE								
BENZO(A)PYRENE								
BENZO(B)FLUORANTHENE								
BENZO(G,H,I)PERYLENE								
BENZO(K)FLUORANTHENE								
BIS(2-CHLOROETHOXY)METHANE								
BIS(2-CHLOROETHYL)ETHER								
BIS(2-ETHYLHEXYL)PHTHALATE								
BUTYL BENZYL PHTHALATE								
CARBAZOLE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB025	S57SB025	S57SB026	S57SB027	S57SB027	S57SB027	S57SB027	S57SB027
Sample ID	S57SB0250203	S57SB0250303	S57SB0260103	S57SS0270103	S57SB0270103	S57SB0270203	S57SB0270303	S57SB0270403
Depth Range	8 - 10	12 - 14	8 - 9	0 - 0.5	4 - 5	8 - 10	12 - 14	16 - 18
Sample Date	8/15/2001	8/15/2001	8/15/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001
CHRYSENE								
DI-N-BUTYL PHTHALATE								
DI-N-OCTYL PHTHALATE								
DIBENZO(A,H)ANTHRACENE								
DIBENZOFURAN								
DIETHYL PHTHALATE								
DIMETHYL PHTHALATE								
FLUORANTHENE								
FLUORENE								
HEXACHLOROBENZENE								
HEXACHLOROBUTADIENE								
HEXACHLOROCYCLOPENTADIENE								
HEXACHLOROETHANE								
INDENO(1,2,3-CD)PYRENE								
ISOPHORONE								
N-NITROSO-DI-N-PROPYLAMINE								
N-NITROSODIPHENYLAMINE								
NAPHTHALENE								
NITROBENZENE								
PENTACHLOROPHENOL								
PHENANTHRENE								
PHENOL								
PYRENE								
Pesticides/PCBs (ug/kg)								
4,4'-DDD								
4,4'-DDE								
4,4'-DDT								
ALDRIN								
ALPHA-BHC								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB025	S57SB025	S57SB026	S57SB027	S57SB027	S57SB027	S57SB027	S57SB027
Sample ID	S57SB0250203	S57SB0250303	S57SB0260103	S57SS0270103	S57SB0270103	S57SB0270203	S57SB0270303	S57SB0270403
Depth Range	8 - 10	12 - 14	8 - 9	0 - 0.5	4 - 5	8 - 10	12 - 14	16 - 18
Sample Date	8/15/2001	8/15/2001	8/15/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001
ALPHA-CHLORDANE								
AROCLOR-1016								
AROCLOR-1221								
AROCLOR-1232								
AROCLOR-1242								
AROCLOR-1248								
AROCLOR-1254								
AROCLOR-1260								
BETA-BHC								
DELTA-BHC								
DIELDRIN								
ENDOSULFAN I								
ENDOSULFAN II								
ENDOSULFAN SULFATE								
ENDRIN								
ENDRIN ALDEHYDE								
ENDRIN KETONE								
GAMMA-BHC (LINDANE)								
GAMMA-CHLORDANE								
HEPTACHLOR								
HEPTACHLOR EPOXIDE								
METHOXYCHLOR								
TOXAPHENE								
Explosives (ug/kg)								
1,3-DINITROBENZENE								
2,4,6-TRINITROTOLUENE								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								
2-AMINO-4,6-DINITROTOLUENE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB025	S57SB025	S57SB026	S57SB027	S57SB027	S57SB027	S57SB027	S57SB027
Sample ID	S57SB0250203	S57SB0250303	S57SB0260103	S57SS0270103	S57SB0270103	S57SB0270203	S57SB0270303	S57SB0270403
Depth Range	8 - 10	12 - 14	8 - 9	0 - 0.5	4 - 5	8 - 10	12 - 14	16 - 18
Sample Date	8/15/2001	8/15/2001	8/15/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001
2-NITROTOLUENE								
3-NITROTOLUENE								
4-AMINO-2,6-DINITROTOLUENE								
4-NITROTOLUENE								
HMX								
NITROBENZENE								
NITROCELLULOSE								
NITROGLYCERIN								
NITROGUANIDINE								
RDX								
TETRYL								
Inorganics (mg/kg)								
ALUMINUM								
ANTIMONY								
ARSENIC								
BARIUM								
BERYLLIUM								
CADMIUM								
CALCIUM								
CHROMIUM								
COBALT								
COPPER								
IRON								
LEAD								
MAGNESIUM								
MANGANESE								
MERCURY								
NICKEL								
POTASSIUM								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB025	S57SB025	S57SB026	S57SB027	S57SB027	S57SB027	S57SB027	S57SB027
Sample ID	S57SB0250203	S57SB0250303	S57SB0260103	S57SS0270103	S57SB0270103	S57SB0270203	S57SB0270303	S57SB0270403
Depth Range	8 - 10	12 - 14	8 - 9	0 - 0.5	4 - 5	8 - 10	12 - 14	16 - 18
Sample Date	8/15/2001	8/15/2001	8/15/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001	8/21/2001
SELENIUM								
SILVER								
SODIUM								
THALLIUM								
VANADIUM								
ZINC								
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)								
PH (MEQ/1)								
PH (S.U.)								
TOTAL ORGANIC CARBON (MG/KG)			51000					
TOTAL SOLIDS (%)								
Field Parameters								
BULK DENSITY (PCF)								
POROSITY (%)								
SIEVE 1" (%)								
SIEVE 1-1/2" (%)								
SIEVE 1/2" (%)								
SIEVE 3/4" (%)								
SIEVE 3/8" (%)								
SIEVE NO. 004 (%)								
SIEVE NO. 010 (%)								
SIEVE NO. 020 (%)								
SIEVE NO. 040 (%)								
SIEVE NO. 100 (%)								
SIEVE NO. 200 (%)								
SPECIFIC GRAVITY (S.U.)								

Round	2003Q2	2003Q2	2003Q2	2003Q2	2003Q2	2001Q3	2001Q3
Location	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57SB028	S57SB028
Sample ID	S57SB0270104	S57SB0270104-D	S57SB0270204	S57SB0270304	S57SB0270404	S57SS0280103	S57SB0280103
Depth Range	4 - 5	4 - 5	9 - 10	13 - 14	15 - 16	0 - 0.5	4 - 5
Sample Date	5/14/2003	5/14/2003	5/14/2003	5/14/2003	5/14/2003	8/16/2001	8/16/2001
Volatile Organics (ug/kg)							
1,1,1-TRICHLOROETHANE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
1,1,2,2-TETRACHLOROETHANE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
1,1,2-TRICHLOROETHANE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
1,1,2-TRICHLOROTRIFLUOROETHANE						6.5 U	6.3 U
1,1-DICHLOROETHANE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
1,1-DICHLOROETHENE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
1,2-DICHLOROETHANE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
1,2-DICHLOROPROPANE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
2-BUTANONE						6.5 U	6.3 U
2-HEXANONE						6.5 U	6.3 U
4-METHYL-2-PENTANONE						6.5 U	6.3 U
ACETONE						22 B	61 B
BENZENE						6.5 U	6.3 U
BROMODICHLOROMETHANE						6.5 U	6.3 U
BROMOFORM						6.5 U	6.3 U
BROMOMETHANE						6.5 U	6.3 U
CARBON DISULFIDE						6.5 U	6.3 U
CARBON TETRACHLORIDE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
CHLOROBENZENE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
CHLORODIBROMOMETHANE						6.5 U	6.3 U
CHLOROETHANE	13 U	9200 U	16000 U	6600 U	10 U	6.5 U	6.3 U
CHLOROFORM	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
CHLOROMETHANE	13 U	9200 U	16000 U	6600 U	10 U	6.5 U	6.3 U
CIS-1,2-DICHLOROETHENE	13 U	4600 U	13000	8400	10 B	6.5 U	6.3 U
CIS-1,3-DICHLOROPROPENE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
CYCLOHEXANE						6.5 U	6.3 U
DIETHYL ETHER	13 U	4600 U	8000 U	3300 U	42	6.5 U	6.3 U
ETHYLBENZENE						6.5 U	6.3 U

Round	2003Q2	2003Q2	2003Q2	2003Q2	2003Q2	2001Q3	2001Q3
Location	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57SB028	S57SB028
Sample ID	S57SB0270104	S57SB0270104-D	S57SB0270204	S57SB0270304	S57SB0270404	S57SS0280103	S57SB0280103
Depth Range	4 - 5	4 - 5	9 - 10	13 - 14	15 - 16	0 - 0.5	4 - 5
Sample Date	5/14/2003	5/14/2003	5/14/2003	5/14/2003	5/14/2003	8/16/2001	8/16/2001
ISOPROPYLBENZENE						6.5 U	6.3 U
M+P-XYLENES						6.5 U	6.3 U
METHYL ACETATE						6.5 U	6.3 U
METHYL CYCLOHEXANE						6.5 U	6.3 U
METHYL TERT-BUTYL ETHER						6.5 U	6.3 U
METHYLENE CHLORIDE	13 U	4600 U	8000 U	3300 U	8 B	21 B	18 B
O-XYLENE						6.5 U	6.3 U
STYRENE						6.5 U	6.3 U
TETRACHLOROETHENE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
TOLUENE						6.5 U	6.3 U
TOTAL XYLENES							
TRANS-1,2-DICHLOROETHENE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
TRANS-1,3-DICHLOROPROPENE	13 U	4600 U	8000 U	3300 U	5 U	6.5 U	6.3 U
TRICHLOROETHENE	17 J	12000 J	110000	56000	42	6.5 U	6.3 U
VINYL CHLORIDE	13 U	9200 U	16000 U	6600 U	10 U	6.5 U	6.3 U
Semivolatile Organics (ug/kg)							
1,2,4-TRICHLOROBENZENE							
1,2-DICHLOROBENZENE							
1,3,5-TRINITROBENZENE							
1,3-DICHLOROBENZENE							
1,4-DICHLOROBENZENE							
2,2'-OXYBIS(1-CHLOROPROPANE)							
2,4,5-TRICHLOROPHENOL							
2,4,6-TRICHLOROPHENOL							
2,4-DICHLOROPHENOL							
2,4-DIMETHYLPHENOL							
2,4-DINITROPHENOL							
2,4-DINITROTOLUENE							
2,6-DINITROTOLUENE							

Round	2003Q2	2003Q2	2003Q2	2003Q2	2003Q2	2001Q3	2001Q3
Location	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57SB028	S57SB028
Sample ID	S57SB0270104	S57SB0270104-D	S57SB0270204	S57SB0270304	S57SB0270404	S57SS0280103	S57SB0280103
Depth Range	4 - 5	4 - 5	9 - 10	13 - 14	15 - 16	0 - 0.5	4 - 5
Sample Date	5/14/2003	5/14/2003	5/14/2003	5/14/2003	5/14/2003	8/16/2001	8/16/2001
2-CHLORONAPHTHALENE							
2-CHLOROPHENOL							
2-METHYLNAPHTHALENE							
2-METHYLPHENOL							
2-NITROANILINE							
2-NITROPHENOL							
3,3'-DICHLOROBENZIDINE							
3-NITROANILINE							
4,6-DINITRO-2-METHYLPHENOL							
4-BROMOPHENYL PHENYL ETHER							
4-CHLORO-3-METHYLPHENOL							
4-CHLOROANILINE							
4-CHLOROPHENYL PHENYL ETHER							
4-METHYLPHENOL							
4-NITROANILINE							
4-NITROPHENOL							
ACENAPHTHENE							
ACENAPHTHYLENE							
ANTHRACENE							
BENZO(A)ANTHRACENE							
BENZO(A)PYRENE							
BENZO(B)FLUORANTHENE							
BENZO(G,H,I)PERYLENE							
BENZO(K)FLUORANTHENE							
BIS(2-CHLOROETHOXY)METHANE							
BIS(2-CHLOROETHYL)ETHER							
BIS(2-ETHYLHEXYL)PHTHALATE							
BUTYL BENZYL PHTHALATE							
CARBAZOLE							

Round Location Sample ID Depth Range Sample Date	2003Q2 S57MW024-SB027 S57SB0270104 4 - 5 5/14/2003	2003Q2 S57MW024-SB027 S57SB0270104-D 4 - 5 5/14/2003	2003Q2 S57MW024-SB027 S57SB0270204 9 - 10 5/14/2003	2003Q2 S57MW024-SB027 S57SB0270304 13 - 14 5/14/2003	2003Q2 S57MW024-SB027 S57SB0270404 15 - 16 5/14/2003	2001Q3 S57SB028 S57SS0280103 0 - 0.5 8/16/2001	2001Q3 S57SB028 S57SB0280103 4 - 5 8/16/2001
CHRYSENE							
DI-N-BUTYL PHTHALATE							
DI-N-OCTYL PHTHALATE							
DIBENZO(A,H)ANTHRACENE							
DIBENZOFURAN							
DIETHYL PHTHALATE							
DIMETHYL PHTHALATE							
FLUORANTHENE							
FLUORENE							
HEXACHLOROBENZENE							
HEXACHLOROBUTADIENE							
HEXACHLOROCYCLOPENTADIENE							
HEXACHLOROETHANE							
INDENO(1,2,3-CD)PYRENE							
ISOPHORONE							
N-NITROSO-DI-N-PROPYLAMINE							
N-NITROSODIPHENYLAMINE							
NAPHTHALENE							
NITROBENZENE							
PENTACHLOROPHENOL							
PHENANTHRENE							
PHENOL							
PYRENE							
Pesticides/PCBs (ug/kg)							
4,4'-DDD							
4,4'-DDE							
4,4'-DDT							
ALDRIN							
ALPHA-BHC							

Round	2003Q2	2003Q2	2003Q2	2003Q2	2003Q2	2001Q3	2001Q3
Location	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57SB028	S57SB028
Sample ID	S57SB0270104	S57SB0270104-D	S57SB0270204	S57SB0270304	S57SB0270404	S57SS0280103	S57SB0280103
Depth Range	4 - 5	4 - 5	9 - 10	13 - 14	15 - 16	0 - 0.5	4 - 5
Sample Date	5/14/2003	5/14/2003	5/14/2003	5/14/2003	5/14/2003	8/16/2001	8/16/2001
ALPHA-CHLORDANE							
AROCLOR-1016							
AROCLOR-1221							
AROCLOR-1232							
AROCLOR-1242							
AROCLOR-1248							
AROCLOR-1254							
AROCLOR-1260							
BETA-BHC							
DELTA-BHC							
DIELDRIN							
ENDOSULFAN I							
ENDOSULFAN II							
ENDOSULFAN SULFATE							
ENDRIN							
ENDRIN ALDEHYDE							
ENDRIN KETONE							
GAMMA-BHC (LINDANE)							
GAMMA-CHLORDANE							
HEPTACHLOR							
HEPTACHLOR EPOXIDE							
METHOXYCHLOR							
TOXAPHENE							
Explosives (ug/kg)							
1,3-DINITROBENZENE							
2,4,6-TRINITROTOLUENE							
2,4-DINITROTOLUENE							
2,6-DINITROTOLUENE							
2-AMINO-4,6-DINITROTOLUENE							

Round	2003Q2	2003Q2	2003Q2	2003Q2	2003Q2	2001Q3	2001Q3
Location	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57SB028	S57SB028
Sample ID	S57SB0270104	S57SB0270104-D	S57SB0270204	S57SB0270304	S57SB0270404	S57SS0280103	S57SB0280103
Depth Range	4 - 5	4 - 5	9 - 10	13 - 14	15 - 16	0 - 0.5	4 - 5
Sample Date	5/14/2003	5/14/2003	5/14/2003	5/14/2003	5/14/2003	8/16/2001	8/16/2001
2-NITROTOLUENE							
3-NITROTOLUENE							
4-AMINO-2,6-DINITROTOLUENE							
4-NITROTOLUENE							
HMX							
NITROBENZENE							
NITROCELLULOSE							
NITROGLYCERIN							
NITROGUANIDINE							
RDX							
TETRYL							
Inorganics (mg/kg)							
ALUMINUM							
ANTIMONY							
ARSENIC	32.8 J	6.3 J	1.8 J	7.3 J	0.22 J		
BARIUM							
BERYLLIUM							
CADMIUM							
CALCIUM							
CHROMIUM							
COBALT							
COPPER							
IRON							
LEAD							
MAGNESIUM							
MANGANESE							
MERCURY							
NICKEL							
POTASSIUM							

Round	2003Q2	2003Q2	2003Q2	2003Q2	2003Q2	2001Q3	2001Q3
Location	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57MW024-SB027	S57SB028	S57SB028
Sample ID	S57SB0270104	S57SB0270104-D	S57SB0270204	S57SB0270304	S57SB0270404	S57SS0280103	S57SB0280103
Depth Range	4 - 5	4 - 5	9 - 10	13 - 14	15 - 16	0 - 0.5	4 - 5
Sample Date	5/14/2003	5/14/2003	5/14/2003	5/14/2003	5/14/2003	8/16/2001	8/16/2001
SELENIUM							
SILVER							
SODIUM							
THALLIUM							
VANADIUM							
ZINC							
Miscellaneous Parameters							
CATION EXCHANGE CAPACITY (MEQ/1)							
PH (MEQ/1)							
PH (S.U.)							
TOTAL ORGANIC CARBON (MG/KG)							
TOTAL SOLIDS (%)	72	71	77	82	84		
Field Parameters							
BULK DENSITY (PCF)							
POROSITY (%)							
SIEVE 1" (%)							
SIEVE 1-1/2" (%)							
SIEVE 1/2" (%)							
SIEVE 3/4" (%)							
SIEVE 3/8" (%)							
SIEVE NO. 004 (%)							
SIEVE NO. 010 (%)							
SIEVE NO. 020 (%)							
SIEVE NO. 040 (%)							
SIEVE NO. 100 (%)							
SIEVE NO. 200 (%)							
SPECIFIC GRAVITY (S.U.)							

Round	2001Q3	2001Q3	2001Q3	2001Q3	2003Q2	2003Q2	2003Q2	2001Q3
Location	S57SB028	S57SB028	S57SB028	S57SB028	S57MW025-SB028	S57MW025-SB028	S57MW025-SB028	S57SB029
Sample ID	S57SB0280103-D	S57SB0280203	S57SB0280303	S57SB0280403	S57SB0280104	S57SB0280204	S57SB0280304	S57SB0290403-D
Depth Range	4 - 5	10 - 12	12 - 14	18 - 20	4 - 5	9 - 10	14 - 15	24 - 26
Sample Date	8/16/2001	8/16/2001	8/16/2001	8/16/2001	5/14/2003	5/14/2003	5/14/2003	8/16/2001
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
1,1,2,2-TETRACHLOROETHANE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
1,1,2-TRICHLOROETHANE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
1,1,2-TRICHLOROTRIFLUOROETHANE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
1,1-DICHLOROETHANE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
1,1-DICHLOROETHENE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
1,2-DICHLOROETHANE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
1,2-DICHLOROPROPANE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
2-BUTANONE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
2-HEXANONE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
4-METHYL-2-PENTANONE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
ACETONE	42 B	23 B	18 B	17 B				28 B
BENZENE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
BROMODICHLOROMETHANE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
BROMOFORM	6.4 U	6 U	6.2 U	6.5 U				6.6 U
BROMOMETHANE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
CARBON DISULFIDE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
CARBON TETRACHLORIDE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
CHLOROBENZENE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
CHLORODIBROMOMETHANE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
CHLOROETHANE	6.4 U	6 U	6.2 U	6.5 U	12 U	760 U	11 U	6.6 U
CHLOROFORM	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
CHLOROMETHANE	6.4 U	6 U	6.2 U	6.5 U	12 U	760 U	11 U	6.6 U
CIS-1,2-DICHLOROETHENE	6.4 U	6 U	6.2 U	6.5 U	27	5800	5 J	6.6 U
CIS-1,3-DICHLOROPROPENE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
CYCLOHEXANE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
DIETHYL ETHER	6.4 U	11	54	14	12 U	380 U	6	6.6 U
ETHYLBENZENE	6.4 U	6 U	6.2 U	6.5 U				6.6 U

Round	2001Q3	2001Q3	2001Q3	2001Q3	2003Q2	2003Q2	2003Q2	2001Q3
Location	S57SB028	S57SB028	S57SB028	S57SB028	S57MW025-SB028	S57MW025-SB028	S57MW025-SB028	S57SB029
Sample ID	S57SB0280103-D	S57SB0280203	S57SB0280303	S57SB0280403	S57SB0280104	S57SB0280204	S57SB0280304	S57SB0290403-D
Depth Range	4 - 5	10 - 12	12 - 14	18 - 20	4 - 5	9 - 10	14 - 15	24 - 26
Sample Date	8/16/2001	8/16/2001	8/16/2001	8/16/2001	5/14/2003	5/14/2003	5/14/2003	8/16/2001
ISOPROPYLBENZENE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
M+P-XYLENES	6.4 U	6 U	6.2 U	6.5 U				6.6 U
METHYL ACETATE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
METHYL CYCLOHEXANE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
METHYL TERT-BUTYL ETHER	6.4 U	6 U	6.2 U	6.5 U				6.6 U
METHYLENE CHLORIDE	19 B	15 B	7 B	7.6 B	12 U	380 U	290 UR	3.2 B
O-XYLENE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
STYRENE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
TETRACHLOROETHENE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
TOLUENE	6.4 U	6 U	6.2 U	6.5 U				6.6 U
TOTAL XYLENES								
TRANS-1,2-DICHLOROETHENE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
TRANS-1,3-DICHLOROPROPENE	6.4 U	6 U	6.2 U	6.5 U	12 U	380 U	6 U	6.6 U
TRICHLOROETHENE	6.4 U	6 U	6.2 U	6.5 U	63	380 U	6 B	6.6 U
VINYL CHLORIDE	6.4 U	6 U	6.2 U	6.5 U	12 U	130 J	11 U	6.6 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE								
1,2-DICHLOROBENZENE								
1,3,5-TRINITROBENZENE								
1,3-DICHLOROBENZENE								
1,4-DICHLOROBENZENE								
2,2'-OXYBIS(1-CHLOROPROPANE)								
2,4,5-TRICHLOROPHENOL								
2,4,6-TRICHLOROPHENOL								
2,4-DICHLOROPHENOL								
2,4-DIMETHYLPHENOL								
2,4-DINITROPHENOL								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2003Q2	2003Q2	2003Q2	2001Q3
Location	S57SB028	S57SB028	S57SB028	S57SB028	S57MW025-SB028	S57MW025-SB028	S57MW025-SB028	S57SB029
Sample ID	S57SB0280103-D	S57SB0280203	S57SB0280303	S57SB0280403	S57SB0280104	S57SB0280204	S57SB0280304	S57SB0290403-D
Depth Range	4 - 5	10 - 12	12 - 14	18 - 20	4 - 5	9 - 10	14 - 15	24 - 26
Sample Date	8/16/2001	8/16/2001	8/16/2001	8/16/2001	5/14/2003	5/14/2003	5/14/2003	8/16/2001
2-CHLORONAPHTHALENE								
2-CHLOROPHENOL								
2-METHYLNAPHTHALENE								
2-METHYLPHENOL								
2-NITROANILINE								
2-NITROPHENOL								
3,3'-DICHLOROBENZIDINE								
3-NITROANILINE								
4,6-DINITRO-2-METHYLPHENOL								
4-BROMOPHENYL PHENYL ETHER								
4-CHLORO-3-METHYLPHENOL								
4-CHLOROANILINE								
4-CHLOROPHENYL PHENYL ETHER								
4-METHYLPHENOL								
4-NITROANILINE								
4-NITROPHENOL								
ACENAPHTHENE								
ACENAPHTHYLENE								
ANTHRACENE								
BENZO(A)ANTHRACENE								
BENZO(A)PYRENE								
BENZO(B)FLUORANTHENE								
BENZO(G,H,I)PERYLENE								
BENZO(K)FLUORANTHENE								
BIS(2-CHLOROETHOXY)METHANE								
BIS(2-CHLOROETHYL)ETHER								
BIS(2-ETHYLHEXYL)PHTHALATE								
BUTYL BENZYL PHTHALATE								
CARBAZOLE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2003Q2	2003Q2	2003Q2	2001Q3
Location	S57SB028	S57SB028	S57SB028	S57SB028	S57MW025-SB028	S57MW025-SB028	S57MW025-SB028	S57SB029
Sample ID	S57SB0280103-D	S57SB0280203	S57SB0280303	S57SB0280403	S57SB0280104	S57SB0280204	S57SB0280304	S57SB0290403-D
Depth Range	4 - 5	10 - 12	12 - 14	18 - 20	4 - 5	9 - 10	14 - 15	24 - 26
Sample Date	8/16/2001	8/16/2001	8/16/2001	8/16/2001	5/14/2003	5/14/2003	5/14/2003	8/16/2001
CHRYSENE								
DI-N-BUTYL PHTHALATE								
DI-N-OCTYL PHTHALATE								
DIBENZO(A,H)ANTHRACENE								
DIBENZOFURAN								
DIETHYL PHTHALATE								
DIMETHYL PHTHALATE								
FLUORANTHENE								
FLUORENE								
HEXACHLOROBENZENE								
HEXACHLOROBUTADIENE								
HEXACHLOROCYCLOPENTADIENE								
HEXACHLOROETHANE								
INDENO(1,2,3-CD)PYRENE								
ISOPHORONE								
N-NITROSO-DI-N-PROPYLAMINE								
N-NITROSODIPHENYLAMINE								
NAPHTHALENE								
NITROBENZENE								
PENTACHLOROPHENOL								
PHENANTHRENE								
PHENOL								
PYRENE								
Pesticides/PCBs (ug/kg)								
4,4'-DDD								
4,4'-DDE								
4,4'-DDT								
ALDRIN								
ALPHA-BHC								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2003Q2	2003Q2	2003Q2	2001Q3
Location	S57SB028	S57SB028	S57SB028	S57SB028	S57MW025-SB028	S57MW025-SB028	S57MW025-SB028	S57SB029
Sample ID	S57SB0280103-D	S57SB0280203	S57SB0280303	S57SB0280403	S57SB0280104	S57SB0280204	S57SB0280304	S57SB0290403-D
Depth Range	4 - 5	10 - 12	12 - 14	18 - 20	4 - 5	9 - 10	14 - 15	24 - 26
Sample Date	8/16/2001	8/16/2001	8/16/2001	8/16/2001	5/14/2003	5/14/2003	5/14/2003	8/16/2001
ALPHA-CHLORDANE								
AROCLOR-1016								
AROCLOR-1221								
AROCLOR-1232								
AROCLOR-1242								
AROCLOR-1248								
AROCLOR-1254								
AROCLOR-1260								
BETA-BHC								
DELTA-BHC								
DIELDRIN								
ENDOSULFAN I								
ENDOSULFAN II								
ENDOSULFAN SULFATE								
ENDRIN								
ENDRIN ALDEHYDE								
ENDRIN KETONE								
GAMMA-BHC (LINDANE)								
GAMMA-CHLORDANE								
HEPTACHLOR								
HEPTACHLOR EPOXIDE								
METHOXYCHLOR								
TOXAPHENE								
Explosives (ug/kg)								
1,3-DINITROBENZENE								
2,4,6-TRINITROTOLUENE								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								
2-AMINO-4,6-DINITROTOLUENE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2003Q2	2003Q2	2003Q2	2001Q3
Location	S57SB028	S57SB028	S57SB028	S57SB028	S57MW025-SB028	S57MW025-SB028	S57MW025-SB028	S57SB029
Sample ID	S57SB0280103-D	S57SB0280203	S57SB0280303	S57SB0280403	S57SB0280104	S57SB0280204	S57SB0280304	S57SB0290403-D
Depth Range	4 - 5	10 - 12	12 - 14	18 - 20	4 - 5	9 - 10	14 - 15	24 - 26
Sample Date	8/16/2001	8/16/2001	8/16/2001	8/16/2001	5/14/2003	5/14/2003	5/14/2003	8/16/2001
2-NITROTOLUENE								
3-NITROTOLUENE								
4-AMINO-2,6-DINITROTOLUENE								
4-NITROTOLUENE								
HMX								
NITROBENZENE								
NITROCELLULOSE								
NITROGLYCERIN								
NITROGUANIDINE								
RDX								
TETRYL								
Inorganics (mg/kg)								
ALUMINUM								
ANTIMONY								
ARSENIC					11.4 J	2.4 J	0.64 J	
BARIUM								
BERYLLIUM								
CADMIUM								
CALCIUM								
CHROMIUM								
COBALT								
COPPER								
IRON								
LEAD								
MAGNESIUM								
MANGANESE								
MERCURY								
NICKEL								
POTASSIUM								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2003Q2	2003Q2	2003Q2	2001Q3
Location	S57SB028	S57SB028	S57SB028	S57SB028	S57MW025-SB028	S57MW025-SB028	S57MW025-SB028	S57SB029
Sample ID	S57SB0280103-D	S57SB0280203	S57SB0280303	S57SB0280403	S57SB0280104	S57SB0280204	S57SB0280304	S57SB0290403-D
Depth Range	4 - 5	10 - 12	12 - 14	18 - 20	4 - 5	9 - 10	14 - 15	24 - 26
Sample Date	8/16/2001	8/16/2001	8/16/2001	8/16/2001	5/14/2003	5/14/2003	5/14/2003	8/16/2001
SELENIUM								
SILVER								
SODIUM								
THALLIUM								
VANADIUM								
ZINC								
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)								
PH (MEQ/1)								
PH (S.U.)								
TOTAL ORGANIC CARBON (MG/KG)								
TOTAL SOLIDS (%)					78	78	87	
Field Parameters								
BULK DENSITY (PCF)								
POROSITY (%)								
SIEVE 1" (%)								
SIEVE 1-1/2" (%)								
SIEVE 1/2" (%)								
SIEVE 3/4" (%)								
SIEVE 3/8" (%)								
SIEVE NO. 004 (%)								
SIEVE NO. 010 (%)								
SIEVE NO. 020 (%)								
SIEVE NO. 040 (%)								
SIEVE NO. 100 (%)								
SIEVE NO. 200 (%)								
SPECIFIC GRAVITY (S.U.)								

Round	2003Q2	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB028	S57SB029	S57SB029	S57SB029	S57SB029	S57SB029	S57SB030	S57SB030
Sample ID	S57SB0280404	S57SS0290103	S57SB0290103	S57SB0290203	S57SB0290303	S57SB0290403	S57SB0300103	S57SB0300203
Depth Range	15 - 16	0 - 0.5	4 - 5	10 - 12	20 - 22	24 - 26	4 - 6	8 - 10
Sample Date	5/14/2003	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/24/2001	8/24/2001
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
1,1,2,2-TETRACHLOROETHANE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
1,1,2-TRICHLOROETHANE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
1,1,2-TRICHLOROTRIFLUOROETHANE		5.8 U	6 U	6.1 U	6.3 U	6.4 U		
1,1-DICHLOROETHANE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
1,1-DICHLOROETHENE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
1,2-DICHLOROETHANE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
1,2-DICHLOROPROPANE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
2-BUTANONE		5.8 U	11	6.1 U	6.3 U	6.4 U	5.7 U	6 U
2-HEXANONE		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
4-METHYL-2-PENTANONE		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
ACETONE		20 B	23 B	15 B	76 B	12 B	5.7 U	6 U
BENZENE		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
BROMODICHLOROMETHANE		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
BROMOFORM		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
BROMOMETHANE		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
CARBON DISULFIDE		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
CARBON TETRACHLORIDE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
CHLOROBENZENE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
CHLORODIBROMOMETHANE		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
CHLOROETHANE	14 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
CHLOROFORM	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
CHLOROMETHANE	14 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
CIS-1,2-DICHLOROETHENE	6 J	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
CIS-1,3-DICHLOROPROPENE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
CYCLOHEXANE		5.8 U	6 U	6.1 U	6.3 U	6.4 U		
DIETHYL ETHER	14	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
ETHYLBENZENE		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U

Round	2003Q2	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB028	S57SB029	S57SB029	S57SB029	S57SB029	S57SB029	S57SB030	S57SB030
Sample ID	S57SB0280404	S57SS0290103	S57SB0290103	S57SB0290203	S57SB0290303	S57SB0290403	S57SB0300103	S57SB0300203
Depth Range	15 - 16	0 - 0.5	4 - 5	10 - 12	20 - 22	24 - 26	4 - 6	8 - 10
Sample Date	5/14/2003	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/24/2001	8/24/2001
ISOPROPYLBENZENE		5.8 U	6 U	6.1 U	6.3 U	6.4 U		
M+P-XYLENES		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
METHYL ACETATE		5.8 U	6 U	6.1 U	6.3 U	6.4 U		
METHYL CYCLOHEXANE		5.8 U	6 U	6.1 U	6.3 U	6.4 U		
METHYL TERT-BUTYL ETHER		5.8 U	6 U	6.1 U	6.3 U	6.4 U		
METHYLENE CHLORIDE	16 B	3 B	2.9 B	2.6 B	2.1 B	2.6 B	5.7 B	6.2 B
O-XYLENE		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
STYRENE		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
TETRACHLOROETHENE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
TOLUENE		5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
TOTAL XYLENES								
TRANS-1,2-DICHLOROETHENE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
TRANS-1,3-DICHLOROPROPENE	7 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
TRICHLOROETHENE	22 B	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
VINYL CHLORIDE	14 U	5.8 U	6 U	6.1 U	6.3 U	6.4 U	5.7 U	6 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE								
1,2-DICHLOROBENZENE								
1,3,5-TRINITROBENZENE								
1,3-DICHLOROBENZENE								
1,4-DICHLOROBENZENE								
2,2'-OXYBIS(1-CHLOROPROPANE)								
2,4,5-TRICHLOROPHENOL								
2,4,6-TRICHLOROPHENOL								
2,4-DICHLOROPHENOL								
2,4-DIMETHYLPHENOL								
2,4-DINITROPHENOL								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								

Round	2003Q2	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB028	S57SB029	S57SB029	S57SB029	S57SB029	S57SB029	S57SB030	S57SB030
Sample ID	S57SB0280404	S57SS0290103	S57SB0290103	S57SB0290203	S57SB0290303	S57SB0290403	S57SB0300103	S57SB0300203
Depth Range	15 - 16	0 - 0.5	4 - 5	10 - 12	20 - 22	24 - 26	4 - 6	8 - 10
Sample Date	5/14/2003	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/24/2001	8/24/2001
2-CHLORONAPHTHALENE								
2-CHLOROPHENOL								
2-METHYLNAPHTHALENE								
2-METHYLPHENOL								
2-NITROANILINE								
2-NITROPHENOL								
3,3'-DICHLOROBENZIDINE								
3-NITROANILINE								
4,6-DINITRO-2-METHYLPHENOL								
4-BROMOPHENYL PHENYL ETHER								
4-CHLORO-3-METHYLPHENOL								
4-CHLOROANILINE								
4-CHLOROPHENYL PHENYL ETHER								
4-METHYLPHENOL								
4-NITROANILINE								
4-NITROPHENOL								
ACENAPHTHENE								
ACENAPHTHYLENE								
ANTHRACENE								
BENZO(A)ANTHRACENE								
BENZO(A)PYRENE								
BENZO(B)FLUORANTHENE								
BENZO(G,H,I)PERYLENE								
BENZO(K)FLUORANTHENE								
BIS(2-CHLOROETHOXY)METHANE								
BIS(2-CHLOROETHYL)ETHER								
BIS(2-ETHYLHEXYL)PHTHALATE								
BUTYL BENZYL PHTHALATE								
CARBAZOLE								

Round	2003Q2	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB028	S57SB029	S57SB029	S57SB029	S57SB029	S57SB029	S57SB030	S57SB030
Sample ID	S57SB0280404	S57SS0290103	S57SB0290103	S57SB0290203	S57SB0290303	S57SB0290403	S57SB0300103	S57SB0300203
Depth Range	15 - 16	0 - 0.5	4 - 5	10 - 12	20 - 22	24 - 26	4 - 6	8 - 10
Sample Date	5/14/2003	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/24/2001	8/24/2001
CHRYSENE								
DI-N-BUTYL PHTHALATE								
DI-N-OCTYL PHTHALATE								
DIBENZO(A,H)ANTHRACENE								
DIBENZOFURAN								
DIETHYL PHTHALATE								
DIMETHYL PHTHALATE								
FLUORANTHENE								
FLUORENE								
HEXACHLOROBENZENE								
HEXACHLOROBUTADIENE								
HEXACHLOROCYCLOPENTADIENE								
HEXACHLOROETHANE								
INDENO(1,2,3-CD)PYRENE								
ISOPHORONE								
N-NITROSO-DI-N-PROPYLAMINE								
N-NITROSODIPHENYLAMINE								
NAPHTHALENE								
NITROBENZENE								
PENTACHLOROPHENOL								
PHENANTHRENE								
PHENOL								
PYRENE								
Pesticides/PCBs (ug/kg)								
4,4'-DDD								
4,4'-DDE								
4,4'-DDT								
ALDRIN								
ALPHA-BHC								

Round	2003Q2	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB028	S57SB029	S57SB029	S57SB029	S57SB029	S57SB029	S57SB030	S57SB030
Sample ID	S57SB0280404	S57SS0290103	S57SB0290103	S57SB0290203	S57SB0290303	S57SB0290403	S57SB0300103	S57SB0300203
Depth Range	15 - 16	0 - 0.5	4 - 5	10 - 12	20 - 22	24 - 26	4 - 6	8 - 10
Sample Date	5/14/2003	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/24/2001	8/24/2001
ALPHA-CHLORDANE								
AROCLOR-1016								
AROCLOR-1221								
AROCLOR-1232								
AROCLOR-1242								
AROCLOR-1248								
AROCLOR-1254								
AROCLOR-1260								
BETA-BHC								
DELTA-BHC								
DIELDRIN								
ENDOSULFAN I								
ENDOSULFAN II								
ENDOSULFAN SULFATE								
ENDRIN								
ENDRIN ALDEHYDE								
ENDRIN KETONE								
GAMMA-BHC (LINDANE)								
GAMMA-CHLORDANE								
HEPTACHLOR								
HEPTACHLOR EPOXIDE								
METHOXYCHLOR								
TOXAPHENE								
Explosives (ug/kg)								
1,3-DINITROBENZENE								
2,4,6-TRINITROTOLUENE								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								
2-AMINO-4,6-DINITROTOLUENE								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2003Q2	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB028	S57SB029	S57SB029	S57SB029	S57SB029	S57SB029	S57SB030	S57SB030
Sample ID	S57SB0280404	S57SS0290103	S57SB0290103	S57SB0290203	S57SB0290303	S57SB0290403	S57SB0300103	S57SB0300203
Depth Range	15 - 16	0 - 0.5	4 - 5	10 - 12	20 - 22	24 - 26	4 - 6	8 - 10
Sample Date	5/14/2003	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/24/2001	8/24/2001
2-NITROTOLUENE								
3-NITROTOLUENE								
4-AMINO-2,6-DINITROTOLUENE								
4-NITROTOLUENE								
HMX								
NITROBENZENE								
NITROCELLULOSE								
NITROGLYCERIN								
NITROGUANIDINE								
RDX								
TETRYL								
Inorganics (mg/kg)								
ALUMINUM								
ANTIMONY								
ARSENIC	2.6 J							
BARIUM								
BERYLLIUM								
CADMIUM								
CALCIUM								
CHROMIUM								
COBALT								
COPPER								
IRON								
LEAD								
MAGNESIUM								
MANGANESE								
MERCURY								
NICKEL								
POTASSIUM								

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2003Q2	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB028	S57SB029	S57SB029	S57SB029	S57SB029	S57SB029	S57SB030	S57SB030
Sample ID	S57SB0280404	S57SS0290103	S57SB0290103	S57SB0290203	S57SB0290303	S57SB0290403	S57SB0300103	S57SB0300203
Depth Range	15 - 16	0 - 0.5	4 - 5	10 - 12	20 - 22	24 - 26	4 - 6	8 - 10
Sample Date	5/14/2003	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/17/2001	8/24/2001	8/24/2001
SELENIUM								
SILVER								
SODIUM								
THALLIUM								
VANADIUM								
ZINC								
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)								
PH (MEQ/1)								7.4
PH (S.U.)								
TOTAL ORGANIC CARBON (MG/KG)								9900
TOTAL SOLIDS (%)	82							
Field Parameters								
BULK DENSITY (PCF)								130.4
POROSITY (%)								29.8
SIEVE 1" (%)								
SIEVE 1-1/2" (%)								
SIEVE 1/2" (%)								
SIEVE 3/4" (%)								
SIEVE 3/8" (%)								100
SIEVE NO. 004 (%)								97.9
SIEVE NO. 010 (%)								95.9
SIEVE NO. 020 (%)								91.4
SIEVE NO. 040 (%)								82.4
SIEVE NO. 100 (%)								58.1
SIEVE NO. 200 (%)								47.8
SPECIFIC GRAVITY (S.U.)								2.57

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB030	S57SB030	S57SB030	S57SB031	S57SB031	S57SB031	S57SB031	S57SB031
Sample ID	S57SB0300203-D	S57SB0300303	S57SB0300403	S57SB0310103	S57SB0310203	S57SB0310203-D	S57SB0310303	S57SB0310403
Depth Range	8 - 10	14 - 16	22 - 24	4 - 6	8 - 10	8 - 10	14 - 16	18 - 20
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001
Volatile Organics (ug/kg)								
1,1,1-TRICHLOROETHANE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
1,1,2,2-TETRACHLOROETHANE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
1,1,2-TRICHLOROETHANE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
1,1,2-TRICHLOROTRIFLUOROETHANE								
1,1-DICHLOROETHANE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
1,1-DICHLOROETHENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
1,2-DICHLOROETHANE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
1,2-DICHLOROPROPANE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
2-BUTANONE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
2-HEXANONE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
4-METHYL-2-PENTANONE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
ACETONE	5.5 U	6.2 U	80 J	35 J	5.9 U	5.5 U	6.5 U	6.4 U
BENZENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
BROMODICHLOROMETHANE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
BROMOFORM	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
BROMOMETHANE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
CARBON DISULFIDE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
CARBON TETRACHLORIDE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
CHLOROBENZENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
CHLORODIBROMOMETHANE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
CHLOROETHANE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
CHLOROFORM	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
CHLOROMETHANE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
CIS-1,2-DICHLOROETHENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
CIS-1,3-DICHLOROPROPENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
CYCLOHEXANE								
DIETHYL ETHER	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
ETHYLBENZENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB030	S57SB030	S57SB030	S57SB031	S57SB031	S57SB031	S57SB031	S57SB031
Sample ID	S57SB0300203-D	S57SB0300303	S57SB0300403	S57SB0310103	S57SB0310203	S57SB0310203-D	S57SB0310303	S57SB0310403
Depth Range	8 - 10	14 - 16	22 - 24	4 - 6	8 - 10	8 - 10	14 - 16	18 - 20
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001
ISOPROPYLBENZENE								
M+P-XYLENES	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
METHYL ACETATE								
METHYL CYCLOHEXANE								
METHYL TERT-BUTYL ETHER								
METHYLENE CHLORIDE	6.1 B	7.1 B	11 B	5.8 B	5.9 B	6.1 B	7 B	8.5 B
O-XYLENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
STYRENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
TETRACHLOROETHENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
TOLUENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
TOTAL XYLENES								
TRANS-1,2-DICHLOROETHENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
TRANS-1,3-DICHLOROPROPENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
TRICHLOROETHENE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
VINYL CHLORIDE	5.5 U	6.2 U	6.4 U	6.2 U	5.9 U	5.5 U	6.5 U	6.4 U
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE								
1,2-DICHLOROBENZENE								
1,3,5-TRINITROBENZENE								
1,3-DICHLOROBENZENE								
1,4-DICHLOROBENZENE								
2,2'-OXYBIS(1-CHLOROPROPANE)								
2,4,5-TRICHLOROPHENOL								
2,4,6-TRICHLOROPHENOL								
2,4-DICHLOROPHENOL								
2,4-DIMETHYLPHENOL								
2,4-DINITROPHENOL								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB030	S57SB030	S57SB030	S57SB031	S57SB031	S57SB031	S57SB031	S57SB031
Sample ID	S57SB0300203-D	S57SB0300303	S57SB0300403	S57SB0310103	S57SB0310203	S57SB0310203-D	S57SB0310303	S57SB0310403
Depth Range	8 - 10	14 - 16	22 - 24	4 - 6	8 - 10	8 - 10	14 - 16	18 - 20
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001
2-CHLORONAPHTHALENE								
2-CHLOROPHENOL								
2-METHYLNAPHTHALENE								
2-METHYLPHENOL								
2-NITROANILINE								
2-NITROPHENOL								
3,3'-DICHLOROBENZIDINE								
3-NITROANILINE								
4,6-DINITRO-2-METHYLPHENOL								
4-BROMOPHENYL PHENYL ETHER								
4-CHLORO-3-METHYLPHENOL								
4-CHLOROANILINE								
4-CHLOROPHENYL PHENYL ETHER								
4-METHYLPHENOL								
4-NITROANILINE								
4-NITROPHENOL								
ACENAPHTHENE								
ACENAPHTHYLENE								
ANTHRACENE								
BENZO(A)ANTHRACENE								
BENZO(A)PYRENE								
BENZO(B)FLUORANTHENE								
BENZO(G,H,I)PERYLENE								
BENZO(K)FLUORANTHENE								
BIS(2-CHLOROETHOXY)METHANE								
BIS(2-CHLOROETHYL)ETHER								
BIS(2-ETHYLHEXYL)PHTHALATE								
BUTYL BENZYL PHTHALATE								
CARBAZOLE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB030	S57SB030	S57SB030	S57SB031	S57SB031	S57SB031	S57SB031	S57SB031
Sample ID	S57SB0300203-D	S57SB0300303	S57SB0300403	S57SB0310103	S57SB0310203	S57SB0310203-D	S57SB0310303	S57SB0310403
Depth Range	8 - 10	14 - 16	22 - 24	4 - 6	8 - 10	8 - 10	14 - 16	18 - 20
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001
CHRYSENE								
DI-N-BUTYL PHTHALATE								
DI-N-OCTYL PHTHALATE								
DIBENZO(A,H)ANTHRACENE								
DIBENZOFURAN								
DIETHYL PHTHALATE								
DIMETHYL PHTHALATE								
FLUORANTHENE								
FLUORENE								
HEXACHLOROBENZENE								
HEXACHLOROBUTADIENE								
HEXACHLOROCYCLOPENTADIENE								
HEXACHLOROETHANE								
INDENO(1,2,3-CD)PYRENE								
ISOPHORONE								
N-NITROSO-DI-N-PROPYLAMINE								
N-NITROSODIPHENYLAMINE								
NAPHTHALENE								
NITROBENZENE								
PENTACHLOROPHENOL								
PHENANTHRENE								
PHENOL								
PYRENE								
Pesticides/PCBs (ug/kg)								
4,4'-DDD								
4,4'-DDE								
4,4'-DDT								
ALDRIN								
ALPHA-BHC								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB030	S57SB030	S57SB030	S57SB031	S57SB031	S57SB031	S57SB031	S57SB031
Sample ID	S57SB0300203-D	S57SB0300303	S57SB0300403	S57SB0310103	S57SB0310203	S57SB0310203-D	S57SB0310303	S57SB0310403
Depth Range	8 - 10	14 - 16	22 - 24	4 - 6	8 - 10	8 - 10	14 - 16	18 - 20
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001
ALPHA-CHLORDANE								
AROCLOR-1016								
AROCLOR-1221								
AROCLOR-1232								
AROCLOR-1242								
AROCLOR-1248								
AROCLOR-1254								
AROCLOR-1260								
BETA-BHC								
DELTA-BHC								
DIELDRIN								
ENDOSULFAN I								
ENDOSULFAN II								
ENDOSULFAN SULFATE								
ENDRIN								
ENDRIN ALDEHYDE								
ENDRIN KETONE								
GAMMA-BHC (LINDANE)								
GAMMA-CHLORDANE								
HEPTACHLOR								
HEPTACHLOR EPOXIDE								
METHOXYCHLOR								
TOXAPHENE								
Explosives (ug/kg)								
1,3-DINITROBENZENE								
2,4,6-TRINITROTOLUENE								
2,4-DINITROTOLUENE								
2,6-DINITROTOLUENE								
2-AMINO-4,6-DINITROTOLUENE								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB030	S57SB030	S57SB030	S57SB031	S57SB031	S57SB031	S57SB031	S57SB031
Sample ID	S57SB0300203-D	S57SB0300303	S57SB0300403	S57SB0310103	S57SB0310203	S57SB0310203-D	S57SB0310303	S57SB0310403
Depth Range	8 - 10	14 - 16	22 - 24	4 - 6	8 - 10	8 - 10	14 - 16	18 - 20
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001
2-NITROTOLUENE								
3-NITROTOLUENE								
4-AMINO-2,6-DINITROTOLUENE								
4-NITROTOLUENE								
HMX								
NITROBENZENE								
NITROCELLULOSE								
NITROGLYCERIN								
NITROGUANIDINE								
RDX								
TETRYL								
Inorganics (mg/kg)								
ALUMINUM								
ANTIMONY								
ARSENIC								
BARIUM								
BERYLLIUM								
CADMIUM								
CALCIUM								
CHROMIUM								
COBALT								
COPPER								
IRON								
LEAD								
MAGNESIUM								
MANGANESE								
MERCURY								
NICKEL								
POTASSIUM								

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB030	S57SB030	S57SB030	S57SB031	S57SB031	S57SB031	S57SB031	S57SB031
Sample ID	S57SB0300203-D	S57SB0300303	S57SB0300403	S57SB0310103	S57SB0310203	S57SB0310203-D	S57SB0310303	S57SB0310403
Depth Range	8 - 10	14 - 16	22 - 24	4 - 6	8 - 10	8 - 10	14 - 16	18 - 20
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/24/2001
SELENIUM								
SILVER								
SODIUM								
THALLIUM								
VANADIUM								
ZINC								
Miscellaneous Parameters								
CATION EXCHANGE CAPACITY (MEQ/1)								
PH (MEQ/1)	4.87		5.65		5.83	5.74		9.08
PH (S.U.)								
TOTAL ORGANIC CARBON (MG/KG)	6600		8900		10000	8100		12000
TOTAL SOLIDS (%)								
Field Parameters								
BULK DENSITY (PCF)			119.2		135.2			123.6
POROSITY (%)			47.3		29.7			40.1
SIEVE 1" (%)								
SIEVE 1-1/2" (%)								
SIEVE 1/2" (%)					100			
SIEVE 3/4" (%)								
SIEVE 3/8" (%)			100		99.3			
SIEVE NO. 004 (%)			100		95.4			
SIEVE NO. 010 (%)			98.2		94			100
SIEVE NO. 020 (%)			97.8		90.9			99.9
SIEVE NO. 040 (%)			96.2		84.6			99.7
SIEVE NO. 100 (%)			92		59.9			70.8
SIEVE NO. 200 (%)			77.2		47			38.2
SPECIFIC GRAVITY (S.U.)			2.56		2.61			2.62

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB032	S57SB032	S57SB032	S57SB032	S57SB033
Sample ID	S57SB0320103	S57SB0320203	S57SB0320303	S57SB0320403	S57SB0330103
Depth Range	6 - 8	8 - 10	14 - 16	18 - 20	10 - 12
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/22/2001
Volatile Organics (ug/kg)					
1,1,1-TRICHLOROETHANE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
1,1,2,2-TETRACHLOROETHANE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
1,1,2-TRICHLOROETHANE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
1,1,2-TRICHLOROTRIFLUOROETHANE					5.8 U
1,1-DICHLOROETHANE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
1,1-DICHLOROETHENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
1,2-DICHLOROETHANE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
1,2-DICHLOROPROPANE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
2-BUTANONE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
2-HEXANONE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
4-METHYL-2-PENTANONE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
ACETONE	5.8 U	5.5 U	5.9 U	5.8 U	18 B
BENZENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
BROMODICHLOROMETHANE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
BROMOFORM	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
BROMOMETHANE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
CARBON DISULFIDE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
CARBON TETRACHLORIDE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
CHLOROBENZENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
CHLORODIBROMOMETHANE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
CHLOROETHANE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
CHLOROFORM	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
CHLOROMETHANE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
CIS-1,2-DICHLOROETHENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
CIS-1,3-DICHLOROPROPENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
CYCLOHEXANE					
DIETHYL ETHER	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
ETHYLBENZENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB032	S57SB032	S57SB032	S57SB032	S57SB033
Sample ID	S57SB0320103	S57SB0320203	S57SB0320303	S57SB0320403	S57SB0330103
Depth Range	6 - 8	8 - 10	14 - 16	18 - 20	10 - 12
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/22/2001
ISOPROPYLBENZENE					
M+P-XYLENES	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
METHYL ACETATE					5.8 U
METHYL CYCLOHEXANE					5.8 U
METHYL TERT-BUTYL ETHER					5.8 U
METHYLENE CHLORIDE	7.8 B	6 B	6.7 B	5.3 B	1.3 J
O-XYLENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
STYRENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
TETRACHLOROETHENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
TOLUENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
TOTAL XYLENES					
TRANS-1,2-DICHLOROETHENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
TRANS-1,3-DICHLOROPROPENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
TRICHLOROETHENE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
VINYL CHLORIDE	5.8 U	5.5 U	5.9 U	5.8 U	5.8 U
Semivolatile Organics (ug/kg)					
1,2,4-TRICHLOROBENZENE					
1,2-DICHLOROBENZENE					
1,3,5-TRINITROBENZENE					
1,3-DICHLOROBENZENE					
1,4-DICHLOROBENZENE					
2,2'-OXYBIS(1-CHLOROPROPANE)					
2,4,5-TRICHLOROPHENOL					
2,4,6-TRICHLOROPHENOL					
2,4-DICHLOROPHENOL					
2,4-DIMETHYLPHENOL					
2,4-DINITROPHENOL					
2,4-DINITROTOLUENE					
2,6-DINITROTOLUENE					

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB032	S57SB032	S57SB032	S57SB032	S57SB033
Sample ID	S57SB0320103	S57SB0320203	S57SB0320303	S57SB0320403	S57SB0330103
Depth Range	6 - 8	8 - 10	14 - 16	18 - 20	10 - 12
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/22/2001
2-CHLORONAPHTHALENE					
2-CHLOROPHENOL					
2-METHYLNAPHTHALENE					
2-METHYLPHENOL					
2-NITROANILINE					
2-NITROPHENOL					
3,3'-DICHLOROBENZIDINE					
3-NITROANILINE					
4,6-DINITRO-2-METHYLPHENOL					
4-BROMOPHENYL PHENYL ETHER					
4-CHLORO-3-METHYLPHENOL					
4-CHLOROANILINE					
4-CHLOROPHENYL PHENYL ETHER					
4-METHYLPHENOL					
4-NITROANILINE					
4-NITROPHENOL					
ACENAPHTHENE					
ACENAPHTHYLENE					
ANTHRACENE					
BENZO(A)ANTHRACENE					
BENZO(A)PYRENE					
BENZO(B)FLUORANTHENE					
BENZO(G,H,I)PERYLENE					
BENZO(K)FLUORANTHENE					
BIS(2-CHLOROETHOXY)METHANE					
BIS(2-CHLOROETHYL)ETHER					
BIS(2-ETHYLHEXYL)PHTHALATE					
BUTYL BENZYL PHTHALATE					
CARBAZOLE					

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB032	S57SB032	S57SB032	S57SB032	S57SB033
Sample ID	S57SB0320103	S57SB0320203	S57SB0320303	S57SB0320403	S57SB0330103
Depth Range	6 - 8	8 - 10	14 - 16	18 - 20	10 - 12
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/22/2001
CHRYSENE					
DI-N-BUTYL PHTHALATE					
DI-N-OCTYL PHTHALATE					
DIBENZO(A,H)ANTHRACENE					
DIBENZOFURAN					
DIETHYL PHTHALATE					
DIMETHYL PHTHALATE					
FLUORANTHENE					
FLUORENE					
HEXACHLOROBENZENE					
HEXACHLOROBUTADIENE					
HEXACHLOROCYCLOPENTADIENE					
HEXACHLOROETHANE					
INDENO(1,2,3-CD)PYRENE					
ISOPHORONE					
N-NITROSO-DI-N-PROPYLAMINE					
N-NITROSODIPHENYLAMINE					
NAPHTHALENE					
NITROBENZENE					
PENTACHLOROPHENOL					
PHENANTHRENE					
PHENOL					
PYRENE					
Pesticides/PCBs (ug/kg)					
4,4'-DDD					
4,4'-DDE					
4,4'-DDT					
ALDRIN					
ALPHA-BHC					

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB032	S57SB032	S57SB032	S57SB032	S57SB033
Sample ID	S57SB0320103	S57SB0320203	S57SB0320303	S57SB0320403	S57SB0330103
Depth Range	6 - 8	8 - 10	14 - 16	18 - 20	10 - 12
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/22/2001
ALPHA-CHLORDANE					
AROCLOR-1016					
AROCLOR-1221					
AROCLOR-1232					
AROCLOR-1242					
AROCLOR-1248					
AROCLOR-1254					
AROCLOR-1260					
BETA-BHC					
DELTA-BHC					
DIELDRIN					
ENDOSULFAN I					
ENDOSULFAN II					
ENDOSULFAN SULFATE					
ENDRIN					
ENDRIN ALDEHYDE					
ENDRIN KETONE					
GAMMA-BHC (LINDANE)					
GAMMA-CHLORDANE					
HEPTACHLOR					
HEPTACHLOR EPOXIDE					
METHOXYCHLOR					
TOXAPHENE					
Explosives (ug/kg)					
1,3-DINITROBENZENE					
2,4,6-TRINITROTOLUENE					
2,4-DINITROTOLUENE					
2,6-DINITROTOLUENE					
2-AMINO-4,6-DINITROTOLUENE					

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB032	S57SB032	S57SB032	S57SB032	S57SB033
Sample ID	S57SB0320103	S57SB0320203	S57SB0320303	S57SB0320403	S57SB0330103
Depth Range	6 - 8	8 - 10	14 - 16	18 - 20	10 - 12
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/22/2001
2-NITROTOLUENE					
3-NITROTOLUENE					
4-AMINO-2,6-DINITROTOLUENE					
4-NITROTOLUENE					
HMX					
NITROBENZENE					
NITROCELLULOSE					
NITROGLYCERIN					
NITROGUANIDINE					
RDX					
TETRYL					
Inorganics (mg/kg)					
ALUMINUM					
ANTIMONY					
ARSENIC					
BARIUM					
BERYLLIUM					
CADMIUM					
CALCIUM					
CHROMIUM					
COBALT					
COPPER					
IRON					
LEAD					
MAGNESIUM					
MANGANESE					
MERCURY					
NICKEL					
POTASSIUM					

SOIL ANALYTICAL RESULTS
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Round	2001Q3	2001Q3	2001Q3	2001Q3	2001Q3
Location	S57SB032	S57SB032	S57SB032	S57SB032	S57SB033
Sample ID	S57SB0320103	S57SB0320203	S57SB0320303	S57SB0320403	S57SB0330103
Depth Range	6 - 8	8 - 10	14 - 16	18 - 20	10 - 12
Sample Date	8/24/2001	8/24/2001	8/24/2001	8/24/2001	8/22/2001
SELENIUM					
SILVER					
SODIUM					
THALLIUM					
VANADIUM					
ZINC					
Miscellaneous Parameters					
CATION EXCHANGE CAPACITY (MEQ/1)					
PH (MEQ/1)		5.29		5.27	
PH (S.U.)					
TOTAL ORGANIC CARBON (MG/KG)		9000		6500	
TOTAL SOLIDS (%)					
Field Parameters					
BULK DENSITY (PCF)		118.6		120.4	
POROSITY (%)		41.5		42.8	
SIEVE 1" (%)					
SIEVE 1-1/2" (%)					
SIEVE 1/2" (%)		94.9		93.4	
SIEVE 3/4" (%)		100		100	
SIEVE 3/8" (%)		92.6		90.7	
SIEVE NO. 004 (%)		89.4		85	
SIEVE NO. 010 (%)		83.9		75.2	
SIEVE NO. 020 (%)		82		73.6	
SIEVE NO. 040 (%)		79.9		72	
SIEVE NO. 100 (%)		74.5		66.5	
SIEVE NO. 200 (%)		72.1		63.6	
SPECIFIC GRAVITY (S.U.)		2.55		2.54	

APPENDIX B

PRELIMINARY REMEDIATION GOAL SUPPORT DOCUMENTATION

PRELIMINARY REMEDIATION GOAL FOR CONSTRUCTION WORKER – ARSENIC IN SOIL

The PRG for is based on the following ratio:

$$\frac{\text{Exposure Point Concentration (EPC)}}{\text{Total HI}} = \frac{\text{Preliminary Remediation Goal (PRG)}}{\text{Target HI}}$$

EPC = 71.7 mg/kg (RI Report Table 9-13)

Total HI = 1.1 (RI Report Table 9.7 in Appendix K)

For a Target HI = 1.0, the PRG is as follows

$$\text{PRG} = \frac{\text{EPC} \times \text{Target HI}}{\text{Total HI}} = \frac{71.7 \times 1.0}{1.1} = 65 \text{ mg/kg}$$

PRELIMINARY REMEDIATION GOAL FOR CHILD RESIDENT – ARSENIC IN SOIL

The PRG for is based on the following ratios for noncarcinogenic and carcinogenic risks, respectively:

$$\frac{\text{EPC}}{\text{Total HI}} = \frac{\text{PRG}}{\text{Target HI}} \quad \text{OR} \quad \frac{\text{EPC}}{\text{Total ICR}} = \frac{\text{PRG}}{\text{Target ICR}}$$

EPC = 71.7 mg/kg (RI Report Table 9-13)

Total HI = 3.2 (RI Report Table 9.13 in Appendix K)

Total ICR – 1.2E-04 (RI Report Table 9.13 in Appendix K)

For a Target HI = 1.0:

$$\text{PRG} = \frac{71.7 \times 1.0}{3.2} = 22.4 \text{ mg/kg}$$

For a Target ICR = 1.0E-04:

$$\text{PRG} = \frac{71.7 \times (1\text{E-}04)}{1.2\text{E-}04} = 60 \text{ mg/kg}$$

Use the lower value for the PRG, 22.4 mg/kg

APPENDIX C

SIMULATED SITE EXCAVATION STATISTICS

SIMULATED SITE EXCAVATION STATISTICS

The establishment of excavation limits for Site 57 at Indian Head was conducted to achieve a common goal that not all soil associated with concentrations greater than the designated preliminary remediation goal (PRG) had to be removed. Instead, the risk-based evaluation would define the smallest possible contiguous area of excavation that would result in "acceptable" residual risks to human health and the environment. Using ProUCL Version 3.0 methodology (Singh, 2004) to calculate exposure point concentrations (EPCs) and compare them to a PRG, the remediation effort would be considered complete the cumulative risk associated with all chemicals of concern (COCs) was less than the target risk. Trichloroethene (TCE), cis-1,2-dichloroethene (DCE), and arsenic were the analytes which were evaluated for potential remediation. The following is a description of the process used to establish the pick-up levels for the analytes.

A PRG for each analyte was specified prior to the statistical analysis (TCE = 28 ug/kg, DCE = 200 ug/kg, and arsenic = 22.5 mg/kg). With those limits established, the data was analyzed and it was determined that TCE was the risk driver at which the remediation process should address first. All existing soil data between 0 – 8 ft bgs was used to evaluate site conditions and estimate proposed excavation locations. By performing simulated excavations on the maximum concentration, statistical evaluations of the residual TCE contamination were conducted to confirm that removal actions based on the proposed excavation location would result in EPCs less than or equal to the selected PRG. Once TCE was found to be at "acceptable" levels, DCE and arsenic would be evaluated to see if any further excavation to reach "acceptable" levels was necessary. For the simulated excavations, all TCE and DCE concentrations within the proposed location of excavation were removed from the data set and replaced with a detection limit based on the site data (13 U ug/kg), all arsenic concentrations were replaced with 5.41 mg/kg which was established based on the upper confidence limit (UCL) of the background data set using ProUCL Version 3.0 methodology. This approach assumes that "clean" fill would be used to backfill the area following excavation and that the arsenic concentration of the "clean" fill would be similar to the arsenic concentration found in soil native to the surrounding area and that no organic concentrations would be found in the "clean" fill.

As shown in Table 1, one location at a time was excavated (based on the maximum concentration) and replaced with the clean-fill concentrations. An EPC was calculated on the new data and the EPC was compared to the PRG to establish whether or not the "acceptable" level was reached. If the maximum concentration of TCE was at depth, and a surface soil sample was analyzed at the same location, both samples at that location were considered to be excavated and back-filled with clean-fill. Therefore, at one location both the surface soil and subsurface soil concentrations would be replaced with the clean-fill replacement concentrations. TCE was found to be within "acceptable" levels after the tenth location was excavated (EPC = 25.1 ug/kg < PRG = 28 ug/kg). Evaluating DCE (Table 2), an EPC of 9.70 ug/kg was calculated which was also less than the respective DCE PRG of 200 ug/kg. No further excavation is necessary for DCE. Arsenic, on the other hand, had an EPC of 31.1 mg/kg which is still greater than the PRG of 22.5 mg/kg (Table 3). Further excavation efforts are needed at the locations where the largest concentrations of arsenic are found. As shown on Table 4, two more excavated locations (three samples) were necessary to establish an "acceptable" level for arsenic.

A summary of the results is presented in Table 5.

Reference:

Singh, A., Singh, A.K. and R.W. Maichle. ProUCL Version 3.0 User Guide. USEPA. EPA/660/R04/079, April 2004.

TABLE 1
SUMMARY OF SIMULATED TCE EXCAVATION
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Site	Location	Nsample	Submatrix	Depth Range	Sample Date	TCE [1]	Remediated Concentration [2]	EPC [3]
							Original EPC without any excavation =	151270
57	SO-07	SO-07-24	SB	2 - 4	9/26/1995	840000	13 U	37919
57	S57SB006	S57SB0060101	SB	3 - 4	10/8/1998	220000	13 U	1351
57		S57SB0270104-AVG	SB	4 - 5	5/14/2003	6008.5 J	13 U	
57		S57SB0270103	SB	4 - 5	8/21/2001	6.1 U	13 U	
57	S57SB027	S57SS0270103	SS	0 - 0.5	8/21/2001	5.8 U	13 U	1094
57	SO-09	SO-09-24	SB	2 - 4	9/26/1995	9300 J	13 U	129
57		S57SB0020101	SB	4 - 6	10/8/1998	810 J	13 U	
57	S57MW003-SB002	S57SS0020101	SS	0 - 0.5	10/8/1998	11 U	13 U	71.3
57		S57SB0180103	SB	4 - 5	8/23/2001	270	13 U	
57	S57SB018	S57SS0180103-AVG	SS	0 - 0.5	8/23/2001	5.5 U	13 U	59.9
57	SO-06	SO-06-24	SB	2 - 4	9/26/1995	220	13 U	50.8
57	S57SB017	S57SS0170103-AVG	SS	0 - 0.5	8/23/2001	215	13 U	40.4
57	SO-01	SO-01-24	SB	2 - 4	9/26/1995	140	13 U	34.8
57	SO-12	SO-12-24	SB	2 - 4	9/26/1995	120	13 U	25.2
EPC IS LESS THAN PRG OF 28 UG/KG / PICK-UP LEVEL IS 120 UG/KG								
57	S57SB007	S57SS0070101	SS	0 - 0.5	10/7/1998	93		
57	S57SB021	S57SB0210103	SB	4 - 5	8/14/2001	82		
57	S57SB028	S57SB0280104	SB	4 - 5	5/14/2003	63		
57	S57SB021	S57SS0210103	SS	0 - 0.5	8/14/2001	53		
57	S57SB019	S57SB0190103	SB	4 - 5	8/23/2001	52		
57	S57SB007	S57SB0070101	SB	4 - 5	10/7/1998	50		
57	S57MW011-SB008	S57SS0080101-AVG	SS	0 - 0.5	10/8/1998	49		
57	S57SB019	S57SS0190103	SS	0 - 0.5	8/23/2001	49		
57	S57MW011-SB008	S57SB0080101-AVG	SB	4 - 6	10/8/1998	48		
57	S57SB012	S57SB0120101	SB	3 - 4	10/7/1998	35		
57	S57SB022	S57SS0220103	SS	0 - 0.5	8/14/2001	21		
57	S57SB023	S57SS0230103	SS	0 - 0.5	8/14/2001	20		
57	S57MW001-SB001	S57SS0010101	SS	0 - 0.5	10/7/1998	13 J		
57	S57SB007	S57SB0070201	SB	6 - 8	10/7/1998	13		
57	S57MW007-SB004	S57SS0040101	SS	0 - 0.5	1/10/1999	10 J		
57	S57SB012	S57SB0120201	SB	7 - 8	10/7/1998	8 J		
57	S57SB025	S57SS0250103	SS	0 - 0.5	8/15/2001	8		
57	S57SB022	S57SB0220103	SB	4 - 5	8/14/2001	7.5		
57	S57SB010	S57SB0100101	SB	3 - 4	10/7/1998	13 U		
57	S57SB010	S57SB0100201	SB	7 - 8	10/7/1998	13 U		
57	S57SB003	S57SB0030101-AVG	SB	3 - 4	10/7/1998	12.5 UJ		
57	S57MW001-SB001	S57SB0010101	SB	2 - 4	10/7/1998	12 U		
57	S57MW009-SB005	S57SB0050101	SB	2 - 4	1/12/1999	12 U		
57	S57MW009-SB005	S57SB0050201-AVG	SB	4 - 6	1/12/1999	12 U		
57	S57MW012-SB013	S57SB0130101	SB	3 - 4	1/9/1999	12 U		
57	S57MW012-SB013	S57SB0130201	SB	6 - 8	1/12/1999	12 U		
57	S57SB003	S57SB0030201-AVG	SB	4 - 6	10/7/1998	12 U		
57	S57SB009	S57SB0090101	SB	3 - 4	10/7/1998	12 U		
57	S57SB009	S57SB0090201	SB	7 - 8	10/7/1998	12 U		
57	S57SB011	S57SB0110101	SB	6 - 8	10/7/1998	12 U		
57	S57SB014	S57SB0140201	SB	7 - 8	10/7/1998	12 U		
57	S57MW009-SB005	S57SS0050101	SS	0 - 0.5	1/12/1999	11 U		
57	S57MW012-SB013	S57SS0130101	SS	0 - 0.5	1/9/1999	11 U		
57	S57SB009	S57SS0090101-AVG	SS	0 - 0.5	1/22/1999	11 U		
57	S57SB011	S57SS0110101	SS	0 - 0.5	10/7/1998	11 U		
57	S57SB014	S57SB0140101	SB	3 - 5	10/7/1998	11 U		
57	S57SB028	S57SS0280103	SS	0 - 0.5	8/16/2001	6.5 U		
57	S57SB028	S57SB0280103-AVG	SB	4 - 5	8/16/2001	6.35 U		
57	S57SB025	S57SB0250103	SB	4 - 5	8/15/2001	6.2 U		
57	S57SB023	S57SB0230103	SB	4 - 5	8/14/2001	6.1 U		
57	S57MW001-SB001	S57SB0010201	SB	4 - 6	10/7/1998	3 J		
57	S57SB029	S57SB0290103	SB	4 - 5	8/17/2001	6 U		
57	S57SB029	S57SS0290103	SS	0 - 0.5	8/17/2001	5.8 U		
57	S57SB024	S57SB0240103	SB	4 - 5	8/15/2001	5.7 U		
57	S57SB017	S57SB0170103	SB	4 - 5	8/23/2001	5.5 J		
57	S57SB024	S57SS0240103	SS	0 - 0.5	8/15/2001	5.5 U		
57	S57SB016	S57SS0160103	SS	0 - 0.5	8/23/2001	5.3 U		
57	S57SB016	S57SB0160103-AVG	SB	4 - 5	8/23/2001	4.05 J		
57	S57MW007-SB004	S57SB0040101	SB	6 - 8	1/10/1999	2 J		
57	S57MW007-SB004	S57SB0040201	SB	4 - 5	1/10/1999	1 J		

1 - Conc. of TCE analyzed for the specified sample.
2 - Conc. of TCE simulated for back-fill after removal of location.
3 - Calculated EPC, compared to PRG of 28 ug/kg for data excavated from specified sample and samples with larger concentrations.

TABLE 2
SUMMARY OF SIMULATED DCE EXCAVATION
EXCAVATED LOCATIONS BASED ON TCE CLEAN-UP
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Site	Location	Nsample	Submatrix	Depth Range	Sample Date	DCE [1]	Remediated Concentration [2]	EPC [3]
							Original EPC without any excavation =	10090
57	SO-07	SO-07-24	SB	2 - 4	9/26/1995	37000	13 U	8742
57	S57SB006	S57SB0060101	SB	3 - 4	10/8/1998	77000	13 U	106
57		S57SB0270104-AVG	SB	4 - 5	5/14/2003	2306.5 U	13 U	
57		S57SB0270103	SB	4 - 5	8/21/2001	6.1 U	13 U	
57	S57SB027	S57SS0270103	SS	0 - 0.5	8/21/2001	5.8 U	13 U	16.2
57	SO-09	SO-09-24	SB	2 - 4	9/26/1995	36	13 U	15.5
57		S57SB0020101	SB	4 - 6	10/8/1998	33	13 U	
57	S57MW003-SB002	S57SS0020101	SS	0 - 0.5	10/8/1998	11 U	13 U	14.9
57		S57SB0180103	SB	4 - 5	8/23/2001	84	13 U	
57	S57SB018	S57SS0180103-AVG	SS	0 - 0.5	8/23/2001	5.5 U	13 U	10.8
57	SO-06	SO-06-24	SB	2 - 4	9/26/1995	14	13 U	10.6
57	S57SB017	S57SS0170103-AVG	SS	0 - 0.5	8/23/2001	22.5	13 U	10.2
57	SO-01	SO-01-24	SB	2 - 4	9/26/1995	18	13 U	9.91
57	SO-12	SO-12-24	SB	2 - 4	9/26/1995	10 J	13 U	9.84
EPC IS LESS THAN PRG OF 200 UG/KG / NO PICK-UP LEVEL NEEDED AFTER EXCAVATION FOR TCE								
57	S57SB019	S57SB0190103	SB	4 - 5	8/23/2001	32		
57	S57SB028	S57SB0280104	SB	4 - 5	5/14/2003	27		
57	S57SB017	S57SB0170103	SB	4 - 5	8/23/2001	16		
57	S57SB021	S57SB0210103	SB	4 - 5	8/14/2001	16		
57	S57SB021	S57SS0210103	SS	0 - 0.5	8/14/2001	16		
57	S57SB022	S57SB0220103	SB	4 - 5	8/14/2001	15		
57	S57SB022	S57SS0220103	SS	0 - 0.5	8/14/2001	14		
57	S57SB019	S57SS0190103	SS	0 - 0.5	8/23/2001	12		
57	S57SB007	S57SB0070101	SB	4 - 5	10/7/1998	11 J		
57	S57SB010	S57SB0100101	SB	3 - 4	10/7/1998	13 U		
57	S57SB010	S57SB0100201	SB	7 - 8	10/7/1998	13 U		
57	S57SB012	S57SB0120201	SB	7 - 8	10/7/1998	13 UJ		
57	S57SB003	S57SB0030101-AVG	SB	3 - 4	10/7/1998	12.5 UJ		
57	S57MW001-SB001	S57SB0010101	SB	2 - 4	10/7/1998	12 U		
57	S57MW007-SB004	S57SB0040101	SB	6 - 8	1/10/1999	12 U		
57	S57MW007-SB004	S57SB0040201	SB	4 - 5	1/10/1999	12 U		
57	S57MW009-SB005	S57SB0050101	SB	2 - 4	1/12/1999	12 U		
57	S57MW009-SB005	S57SB0050201-AVG	SB	4 - 6	1/12/1999	12 U		
57	S57MW011-SB008	S57SB0080101-AVG	SB	4 - 6	10/8/1998	12 U		
57	S57MW012-SB013	S57SB0130101	SB	3 - 4	1/9/1999	12 U		
57	S57MW012-SB013	S57SB0130201	SB	6 - 8	1/12/1999	12 U		
57	S57SB003	S57SB0030201-AVG	SB	4 - 6	10/7/1998	12 U		
57	S57SB009	S57SB0090101	SB	3 - 4	10/7/1998	12 U		
57	S57SB009	S57SB0090201	SB	7 - 8	10/7/1998	12 U		
57	S57SB011	S57SB0110101	SB	6 - 8	10/7/1998	12 U		
57	S57SB012	S57SB0120101	SB	3 - 4	10/7/1998	12 U		
57	S57SB014	S57SB0140201	SB	7 - 8	10/7/1998	12 U		
57	S57MW001-SB001	S57SS0010101	SS	0 - 0.5	10/7/1998	11 UJ		
57	S57MW009-SB005	S57SS0050101	SS	0 - 0.5	1/12/1999	11 U		
57	S57MW011-SB008	S57SS0080101-AVG	SS	0 - 0.5	10/8/1998	11 U		
57	S57MW012-SB013	S57SS0130101	SS	0 - 0.5	1/9/1999	11 U		
57	S57SB007	S57SB0070201	SB	6 - 8	10/7/1998	11 U		
57	S57SB009	S57SS0090101-AVG	SS	0 - 0.5	1/22/1999	11 U		
57	S57SB011	S57SS0110101	SS	0 - 0.5	10/7/1998	11 U		
57	S57SB014	S57SB0140101	SB	3 - 5	10/7/1998	11 U		
57	S57SB007	S57SS0070101	SS	0 - 0.5	10/7/1998	4 J		
57	S57SB023	S57SS0230103	SS	0 - 0.5	8/14/2001	3.9 J		
57	S57SB028	S57SS0280103	SS	0 - 0.5	8/16/2001	6.5 U		
57	S57SB028	S57SB0280103-AVG	SB	4 - 5	8/16/2001	6.35 U		
57	S57SB025	S57SB0250103	SB	4 - 5	8/15/2001	6.2 U		
57	S57SB023	S57SB0230103	SB	4 - 5	8/14/2001	6.1 U		
57	S57MW001-SB001	S57SB0010201	SB	4 - 6	10/7/1998	3 J		
57	S57SB029	S57SB0290103	SB	4 - 5	8/17/2001	6 U		
57	S57SB029	S57SS0290103	SS	0 - 0.5	8/17/2001	5.8 U		
57	S57SB024	S57SB0240103	SB	4 - 5	8/15/2001	5.7 U		
57	S57SB024	S57SS0240103	SS	0 - 0.5	8/15/2001	5.5 U		
57	S57SB025	S57SS0250103	SS	0 - 0.5	8/15/2001	5.5 U		
57	S57SB016	S57SB0160103-AVG	SB	4 - 5	8/23/2001	5.45 U		
57	S57SB016	S57SS0160103	SS	0 - 0.5	8/23/2001	5.3 U		
57	S57MW007-SB004	S57SS0040101	SS	0 - 0.5	1/10/1999	2 J		

1 - Conc. of DCE analyzed for the specified sample.
2 - Conc. of DCE simulated for back-fill after removal of location.
3 - Calculated EPC, compared to PRG of 28 ug/kg for data excavated from specified sample and samples with larger concentrations.

TABLE 3
SUMMARY OF SIMULATED ARSENIC EXCAVATION
EXCAVATED LOCATIONS BASED ON TCE CLEAN-UP
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Site	Location	Nsample	Submatrix	Depth Range	Sample Date	ARSENIC [1]	Remediated Concentration [2]	EPC [3]
							Original EPC without any excavation =	33.6
57	S57SB027	S57SB0270104-AVG	SB	4 - 5	5/14/2003	19.55 J	5.41	33.0
57		S57SS0180103-AVG	SS	0 - 0.5	8/23/2001	24.6	5.41	
57	S57SB018	S57SB0180103	SB	4 - 5	8/23/2001	2.3	5.41	31.9
57	S57SB017	S57SS0170103-AVG	SS	0 - 0.5	8/23/2001	21.4	5.41	31.1
EPC IS NOT LESS THAN PRG OF 22.5 UG/KG / SIMULATED EXCAVATION FOR ARSENIC IS NECESSARY (SEE TABLE 4)								
57	S57SB007	S57SS0070101	SS	0 - 0.5	10/7/1998	103		
57	S57SB021	S57SS0210103	SS	0 - 0.5	8/14/2001	79.9		
57	S57SB007	S57SB0070101	SB	4 - 5	10/7/1998	36.2		
57	S57MW009-SB005	S57SB0050201-AVG	SB	4 - 6	1/12/1999	33.7		
57	S57MW009-SB005	S57SS0050101	SS	0 - 0.5	1/12/1999	33.7		
57	S57SB020	S57SS0200103	SS	0 - 0.5	8/15/2001	33.6		
57	S57MW011-SB008	S57SS0080101-AVG	SS	0 - 0.5	10/8/1998	29.3		
57	S57MW009-SB005	S57SB0050101	SB	2 - 4	1/12/1999	21.3		
57	S57SB016	S57SB0160103-AVG	SB	4 - 5	8/23/2001	17.975 J		
57	S57MW011-SB008	S57SB0080101-AVG	SB	4 - 6	10/8/1998	12.95		
57	S57SB028	S57SB0280104	SB	4 - 5	5/14/2003	11.4 J		
57	S57MW012-SB013	S57SS0130101	SS	0 - 0.5	1/9/1999	9.6		
57	S57SB016	S57SS0160103	SS	0 - 0.5	8/23/2001	6.9		
57	S57SB020	S57SB0200103	SB	4 - 5	8/15/2001	3.3		
57	S57MW012-SB013	S57SB0130101	SB	3 - 4	1/9/1999	2.9		
57	S57SB022	S57SS0220103	SS	0 - 0.5	8/14/2001	2.7		
57	S57MW012-SB013	S57SB0130201	SB	6 - 8	1/12/1999	2.6 L		
57	S57SB007	S57SB0070201	SB	6 - 8	10/7/1998	2.6		
57	S57SB017	S57SB0170103	SB	4 - 5	8/23/2001	2.6		

1 - Conc. of Ars analyzed for the specified sample.
2 - Conc. of Ars simulated for back-fill after removal of location.
3 - Calculated EPC, compared to PRG of 28 ug/kg for data excavated from specified sample and samples with larger concentrations.

TABLE 4
SUMMARY OF SIMULATED ARSENIC EXCAVATION
ADDITIONAL LOCATIONS AFTER TCE REMOVAL
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Site	Location	Nsample	Submatrix	Depth Range	Sample Date	ARSENIC [1]	Remediated Concentration [2]	EPC [3]
Original EPC without any excavation =								33.6
57	S57SB027	S57SB0270104-AVG	SB	4 - 5	5/14/2003	19.55 J	5.41	33.0
57		S57SS0180103-AVG	SS	0 - 0.5	8/23/2001	24.6	5.41	
57	S57SB018	S57SB0180103	SB	4 - 5	8/23/2001	2.3	5.41	31.9
57	S57SB017	S57SS0170103-AVG	SS	0 - 0.5	8/23/2001	21.4	5.41	31.1
SIMULATED EXCAVATION FOR ARSENIC (BELOW)								
57	S57SB007	S57SS0070101	SS	0 - 0.5	10/7/1998	103	5.41	54.1
57	S57SB021	S57SS0210103	SS	0 - 0.5	8/14/2001	79.9	5.41	23.8
57	S57SB007	S57SB0070101	SB	4 - 5	10/7/1998	36.2	5.41	21.5
EPC IS LESS THAN PRG OF 22.5 MG/KG / PICK-UP LEVEL IS 36.2 MG/KG								
57	S57MW009-SB005	S57SB0050201-AVG	SB	4 - 6	1/12/1999	33.7		
57	S57MW009-SB005	S57SS0050101	SS	0 - 0.5	1/12/1999	33.7		
57	S57SB020	S57SS0200103	SS	0 - 0.5	8/15/2001	33.6		
57	S57MW011-SB008	S57SS0080101-AVG	SS	0 - 0.5	10/8/1998	29.3		
57	S57MW009-SB005	S57SB0050101	SB	2 - 4	1/12/1999	21.3		
57	S57SB016	S57SB0160103-AVG	SB	4 - 5	8/23/2001	17.975 J		
57	S57MW011-SB008	S57SB0080101-AVG	SB	4 - 6	10/8/1998	12.95		
57	S57SB028	S57SB0280104	SB	4 - 5	5/14/2003	11.4 J		
57	S57MW012-SB013	S57SS0130101	SS	0 - 0.5	1/9/1999	9.6		
57	S57SB016	S57SS0160103	SS	0 - 0.5	8/23/2001	6.9		
57	S57SB020	S57SB0200103	SB	4 - 5	8/15/2001	3.3		
57	S57MW012-SB013	S57SB0130101	SB	3 - 4	1/9/1999	2.9		
57	S57SB022	S57SS0220103	SS	0 - 0.5	8/14/2001	2.7		
57	S57MW012-SB013	S57SB0130201	SB	6 - 8	1/12/1999	2.6 L		
57	S57SB007	S57SB0070201	SB	6 - 8	10/7/1998	2.6		
57	S57SB017	S57SB0170103	SB	4 - 5	8/23/2001	2.6		

1 - Conc. of Ars analyzed for the specified sample.
2 - Conc. of Ars simulated for back-fill after removal of location.
3 - Calculated EPC, compared to PRG of 28 ug/kg for data excavated from specified sample and samples with larger concentrations.

TABLE 5
SUMMARY OF SIMULATED EXCAVATION
SITE 57 - BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

PARAMETER	CLEAN-UP LEVEL	PRG	NUMBER OF LOCATIONS REMEDIATED	NUMBER OF REMAINING LOCATIONS ABOVE PRGs
TRICHLOROETHENE	120	28	10	6
CIS-1,2-DICHLOROETHENE	---	200	None after TCE Removal	None after TCE Removal
ARSENIC	36.2	22.5	2 additional locations after TCE removal	3

Locations to be Excavated	Depth to Excavate	Analyte causing removal action
SO-07	0 - 4	TCE
S57SB006	0 - 4	TCE
S57SB027	0 - 5	TCE
SO-09	0 - 4	TCE
S57MW003-SB002	0 - 6	TCE
S57SB018	0 - 5	TCE
SO-06	0 - 4	TCE
S57SB017	0 - 0.5	TCE
SO-01	0 - 4	TCE
SO-12	0 - 4	TCE
S57SB007	0 - 5	ARSENIC
S57SB021	0 - 0.5	ARSENIC

APPENDIX D

COST ESTIMATE

CLIENT: NAVAL DISTRICT WASHINGTON - INDIAN HEAD		JOB NUMBER: 112GN2144 0000.1101	
SUBJECT: SITE 57 - BUILDING 292 TCE CONTAMINATION ALTERNATIVE 2 - EXCAVATION AND OFF-SITE DISPOSAL			
BASED ON:		DRAWING NUMBER:	
BY: JLM Date: 10-26-04	CHECKED BY: TJR Date: 12/25/04	APPROVED BY:	DATE:

OBJECTIVE:
To provide support for the quantities used in the Naval District Washington, Indian Head Site 57 – Building 292 TCE Contamination Cost Estimate for the Engineering Evaluation/Cost Analysis Report.

CALCULATIONS:
This alternative consists of excavation of soil to exposure concentrations below PRGs and off-site hazardous waste disposal. Excavated areas will be backfilled with common fill, covered with topsoil, and revegetated. A portion on the area will be repaved with asphalt. There is a storm sewer and several underground utilities in the excavation area. Any utilities damaged during excavation will be replaced.

Construction Survey

Construction Survey =	Approximate Excavation Areas + 20%	
Areas of Excavation =	2,045	sf
Area of Survey =	2,454	sf
=	0.06	acres

Excavation Areas and Volume

All excavated soil will be hauled to a hazardous waste landfill for disposal. The soil is contaminated with a listed hazardous waste (spent TCE). However, the average TCE concentration in the excavated soil (based on the average of positive TCE detections) is less than the LDR treatment standard for contaminated soil. Therefore, treatment would not be required prior to disposal. From Figure 3-1:

Excavation Area 1 =	1,695	sf
Excavation Area 2 =	225	sf
Excavation Area 3 =	125	sf
Total Excavation Area =	2,045	sf
Depth of Excavation =	8	ft
Volume of Excavation =	16,360	cf
=	606	cy

Time of Excavation

Total Excavation Volume =	606	cy

Assume 16 cy per truck.

Number of Truck Loads =	38	truckloads
Number of Truck Loads/Day =	16	truckloads/day
Number of Days =	3	days
Additional Days for Weather =	4	days
Additional Days for Underground Utilities =	2	days
Total Number of Days =	9	days

CLIENT: NAVAL DISTRICT WASHINGTON - INDIAN HEAD		JOB NUMBER: 112GN2144 0000.1101	
SUBJECT: SITE 57 - BUILDING 292 TCE CONTAMINATION ALTERNATIVE 2 - EXCAVATION AND OFF-SITE DISPOSAL			
BASED ON:		DRAWING NUMBER:	
BY: JLM	CHECKED BY: TJR	APPROVED BY:	DATE:
Date: 10-26-04	Date: 12/29/04		

Waste Characterization Testing (1 per 1,000 cy) =	1	sample

Collect verification samples from the sidewalls and floor of excavation. Assume five samples per area plus three quality control samples.

Number of Samples Per Area =	8	samples
Number of Areas =	3	areas
Confirmation Sampling of VOC/Arsenic =	24	samples

Topsoil

Areas of Excavation =	2,045	sf
Depth of Topsoil =	0.5	ft
Volume of Topsoil =	1,023	cf
=	38	cy

Common Fill

Total Volume of Excavation =	606	cy
Volume of Topsoil =	38	cy
Volume of Common Fill	568	cy

Time of Backfill

Volume of Common Fill =	568	cy
Volume of Topsoil =	38	cy
Total Backfill Volume =	606	cy

Assume 16 cy per truck.

Number of Truck Loads =	38	truckloads
Number of Truck Loads/Day =	40	truckloads/day
Number of Days =	1	days
Additional Days for Weather =	4	days
Total Number of Days =	5	days

Seeding (Assume 1 day)

Seed Area = Approximate Excavation Areas + 20% - Asphalt Area

Areas of Excavation =	2,045	sf
Seed Area =	1,679	sf
=	187	sy

CLIENT: NAVAL DISTRICT WASHINGTON - INDIAN HEAD		JOB NUMBER: 112GN2144 0000.1101	
SUBJECT: SITE 57 - BUILDING 292 TCE CONTAMINATION ALTERNATIVE 2 - EXCAVATION AND OFF-SITE DISPOSAL			
BASED ON:		DRAWING NUMBER:	
BY: JLM	CHECKED BY: TJR	APPROVED BY:	DATE:
Date: 10-26-04	Date: 12/29/04		

Asphalt Repair

Asphalt Repair Area = 775 sf

Underground Utility Replacement

Length of Storm Drain Pipe = 40 ft
Length of Water Line = 45 ft

Approximate Construction Schedule

Activity	Days	
Mobilization	3	
Site Setup	5	
Excavate & Dispose	9	
Backfill	5	
Seed	1	
Demobilization	3	
	26	Days or
Assume	1.5	Months

Institutional controls and 5-year reviews will not be required.

NAVAL DISTRICT WASHINGTON - INDIAN HEAD
Indian Head, Maryland
Site 57 - Former Drum Loading Area
Alternative 2: Excavation and Off-Site Disposal
Capital Cost

Item	Quantity	Unit	Unit Cost				Extended Cost				Subtotal
			Subcontract	Material	Labor	Equipment	Subcontract	Material	Labor	Equipment	
1 PROJECT PLANNING & DOCUMENTS											
1.1 Prepare Documents & Plans Including Permits	500	hr			$25.00		$0	$0	$12,500	$0	$12,500
2 MOBILIZATION/DEMOBILIZATION & SITE SUPPORT											
2.1 Office Trailer	1.5	mo				$325.50	$0	$0	$0	$488	$488
2.2 Field Office Support	1.5	mo				$222.50	$0	$0	$0	$334	$334
2.3 Storage Trailer	1.5	mo				$105.00	$0	$0	$0	$158	$158
2.4 Utility Connection/Disconnection (Phone/Electric)	1	ls	$1,500.00				$1,500	$0	$0	$0	$1,500
2.5 Underground Utility Survey	1	ls	$3,720.00				$3,720	$0	$0	$0	$3,720
2.6 Construction Survey	1	ls	$500.00				$500	$0	$0	$0	$500
2.7 Equipment Mobilization/Demobilization	2	ea			$141.00	$336.00	$0	$0	$282	$672	$954
2.8 Site Utilities	1.5	mo		$327.00			$0	$491	$0	$0	$491
3 DECONTAMINATION											
3.1 Equipment Decon Pad	1	ls		$5,800.00	$6,650.00	$700.00	$0	$5,800	$6,650	$700	$13,150
3.2 Decontamination Services	1	mo		$375.00	$1,200.00	$900.00	$0	$375	$1,200	$900	$2,475
3.3 Decon Water	1,000	gal	$0.20				$200	$0	$0	$0	$200
3.4 Decon Water Storage Tank, 6,000 gallon	1	mo				$635.00	$0	$0	$0	$635	$635
3.5 Clean Water Storage Tank, 4,000 gallon	1	mo				$570.00	$0	$0	$0	$570	$570
3.6 Disposal of Decon Waste (Liquid & Solid)	1	mo	$900.00				$900	$0	$0	$0	$900
4 EXCAVATION AND DISPOSAL											
4.1 Soil Excavation	9	day			$278.40	$683.40	$0	$0	$2,506	$6,151	$8,656
4.2 Transportation/Disposal to Hazardous Landfill	606	cy	$144.00				$87,264	$0	$0	$0	$87,264
4.4 Waste Characterization Testing (1 per 1,000 cy)	1	ea	$820.00	$5.00	$20.00	$10.00	$820	$5	$20	$10	$855
4.5 Verification Sampling (VOC & Arsenic)	24	ea	$155.00	$20.00	$50.00	$20.00	$3,720	$480	$1,200	$480	$5,880
5 BACKFILL AND SITE RESTORATION											
5.1 Import Common Fill	568	cy		$6.80			$0	$3,862	$0	$0	$3,862
5.2 Import Topsoil (6" Thick)	38	cy		$18.23			$0	$693	$0	$0	$693
5.3 Place/Grade/Compact Common Fill and Place Topsoil	5	day			$278.40	$683.40	$0	$0	$1,392	$3,417	$4,809
5.4 Fine Grading & Seeding	187	sy		$0.34	$1.31	$0.21	$0	$64	$245	$39	$348
5.5 Asphalt Repair	775	sf	$1.87				$1,449	$0	$0	$0	$1,449
5.6 Replace Storm Drain Pipe (12" VCP)	40	lf		$9.95	$4.78	$0.76	$0	$398	$191	$30	$620
5.7 Pipe Bedding (2' x 2' x 165')	40	lf		$0.58	$1.01	$0.25	$0	$23	$40	$10	$74
5.8 Replace Water Line (8" DI)	42	lf		$12.35	$9.60	$3.62	$0	$519	$403	$152	$1,074
5.9 Pipe Bedding (1.5' x 1.5' x 85')	42	lf		$0.33	$0.57	$0.14	$0	$14	$24	$6	$44
6 MISCELLANEOUS											
6.1 Construction Oversight (3 people * 26 days)	78	day			$200.00		$0	$0	$15,600	$0	$15,600
Subtotal							$100,073	$12,723	$42,253	$14,752	$169,801
Local Area Adjustments							100.0%	100.0%	100.0%	100.0%	
							$100,073	$12,723	$42,253	$14,752	$169,801
Overhead on Labor Cost @ 30%									$12,676		$12,676
G & A on Labor Cost @ 10%									$4,225		$4,225
G & A on Material Cost @ 10%								$1,272			$1,272
G & A on Subcontract Cost @ 10%							$10,007				$10,007
Total Direct Cost							$110,081	$13,995	$59,155	$14,752	$197,982

NAVAL [illegible]ICT WASHINGTON - INDIAN HEAD
Indian Head, Maryland
Site 57 - Former Drum Loading Area
Alternative 2: Excavation and Off-Site Disposal
Capital Cost

Item	Quantity	Unit	Unit Cost				Extended Cost				Subtotal
			Subcontract	Material	Labor	Equipment	Subcontract	Material	Labor	Equipment	
Indirects on Total Direct Cost @	35%	(Total Direct Cost Minus Transportation and Disposal Costs)									$38,436
Profit on Total Direct Cost @	10%										$19,798
Subtotal											$256,217
Health & Safety Monitoring @	2%										$5,124
Total Field Cost											$261,341
Contingency on Total Field Costs @	20%										$52,268
Engineering on Total Field Cost @	10%	(Total Field Cost Minus Transportation and Disposal Costs)									$17,318
TOTAL COST											**$330,927**

TETRA TECH NUS, INC.
661 Andersen Drive • Pittsburgh, PA 15220
Tel 412.921.7090 • Fax 412.921.4040 • www.tetratech.com

PITT-08-5-046

August 26, 2005

Project Number 2144

Commanding Officer
Naval Facilities Engineering Command Washington
1314 Harwood Street, S.E.
Washington Navy Yard, DC 20374
ATTN: Mr. Jeffrey W. Morris (OBP1E)

Reference: CLEAN Contract No. N62472-03-D-0057
Contract Task Order No. 005

Subject: Naval District Washington, Indian Head
Draft Engineering Evaluation/Cost Analysis
Site 57 – Building 292 TCE Contamination

Dear Mr. Morris:

Forwarded herewith are two (2) copies of the final Engineering Evaluation/Cost Analysis (EE/CA) for Site 57, Building 292 TCE Contamination, at the Naval District Washington, Indian Head, Indian Head, Maryland.

By a copy of this letter, two (2) copies of the document are being forwarded to Shawn Jorgensen of Naval District Washington - Indian Head.

Also by a copy of this letter, a single set of change pages and directions for inserting the change pages into the previously issued draft version of the document are being forwarded to each of the following individuals.

Dennis Orenshaw, EPA Region 3	1 copy
Curtis DeTore, MDE	1 copy

If you have any questions regarding the document, please contact me at 412-921-8684.

Sincerely,

George J. Latulippe, P.E.
Project Manager

GJL/kf
Enclosure
cc: Mr. Roger Boucher, NORTHDIV (w/o enclosures)
Mr. John Trepanowski, P.E., Tetra Tech NUS, King of Prussia
Project File 2144

MEMORANDUM

Date: August 22, 2005

To: Jeff Morris, NAVFAC - Washington
Joseph Rail, P.E., NAVFAC - Washington
Shawn Jorgensen, NDW-IH
Dennis Orenshaw, US EPA Region 3
Curtis DeTore, MDE

From: George J. Latulippe, P.E., Tetra Tech NUS, Inc.

Subject: Response to Comments
Draft Engineering Evaluation/Cost Estimate
Site 57 – Building 292 TCE Contamination
Naval District Washington, Indian Head
Indian Head, Maryland

The comments received on the subject document are addressed below. Each individual commenter is identified prior to listing his comments.

Dennis Orenshaw, United States Environmental Protection Agency

No Comments (June 29, 2005)

Curtis DeTore, Maryland Department of the Environment

No Comments (July 27, 2005)

Jeffrey Morris, NAVFAC Washington (April 15, 2005)

1. **Comment:** Table 3-1 - "Marlyand" should be "Maryland".

   Response: The suggested edit will be made.

Shawn Jorgensen, NDW-IH – June 2, 2005

1. **Comment:** Page 3-11, Section 3.5.5, second paragraph, last sentence. Should "stream" be "steam", as in "Hot oil or steam circulates through the auger to indirectly heat the medium."

   Response: The text will be revised to read "Hot oil or steam circulates ..."

2. **Comment:** Chapter 3, Section 3.5.5 Ex-Situ Treatment. I was surprised not to see Soil Washing/Soil Flushing as a possible treatment for contaminated excavated soil. The following site discusses soil washing, including applicability, limitations, etc.: http://www.frtr.gov/matrix2/section4/4-19.html. One of the limitations is "Complex waste mixtures (e.g., metals with organics) make formulating washing fluid difficult," which may be one of the main reasons that you didn't include it. However, I don't know how the cost compares to off-site disposal. If the cost is comparable or less expensive, then it is something that we should look into and include in the EE/CA.

   Related Question: If the approximately 606 cubic yards of contaminated soil is sent off-site for disposal, what will the disposal facility do with it, i.e., would it be placed in a hazardous waste landfill because it's an F-listed waste, or would something else be done with it (washing, incineration, other options???)? If the disposal facility will do anything other than landfill the soil, then it may be wise (and cost effective) to look at the technology that they would use and include it as an option for remediating the soil on-site. What I'm thinking here is that it would be better for us to eliminate the problem ourselves, if possible, rather than transfer the problem to someone else (a hazardous waste landfill).

   Response: Soil washing / soil flushing was not considered in either the draft Feasibility Study or the EE/CA because of the relatively large cost associated with mobilizing the soil washing/flushing equipment to the site. (We had a recent project in the Philadelphia area where the vendor's estimate for Mobilization alone was $100,000.). In general with on-site soil washing/flushing, mobilization costs are prohibitive when the volume to be treated is below 5,000 cubic yards. Although this breakpoint on volume changes based on transportation and disposal costs (e.g., for landfilling), with a volume of 606 cubic yards, the volume was viewed as sufficiently below the threshold as to not require a detailed evaluation. As for treatment at the selected landfill, their unit cost for performing soil washing/flushing would likely be much less than the on-site cost if the landfill has a system in-place and running (i.e., the mobilization cost is not a factor). But again, their costs would be based on the amount of soil to be treated and 606 cubic yards may not be large enough for them to consider treatment, especially if their system does not operate continuously and has to be started up for this small quantity. In any event, if the contaminated soil was treated at a disposal facility, it would be expected to be treated sufficiently to allow it to be either disposed at that facility or used as cover material at the facility.

3. **Comment:** Page 4-2, second complete paragraph on page, last sentence. Since this is an EE/CA that is prepared prior to conducting a Removal Action, will there be a "remedial design" phase? I associate remedial designs with final actions. Would using "removal design phase" be an adequate alternative wording, or will it actually just be a work plan that describes the removal action? I think that it's the latter. Therefore, I suggest the following wording for the last sentence: "The actual size,

design, and location of the staging area(s) would be determined by the removal action contractor and would be presented in the work plan for the removal action."

Response: The need for a design prepared separately from the removal action work plan would be dependent upon the contracting arrangements. For a removal action, it would not be especially unique to have a design consisting of full plans and specifications similar to a "remediation design" prepared for use by a removal action contractor and then have the removal action contractor submit a work plan for implementing the design. However, it would also not be unique to have a removal action contractor prepare his work plan based on an abbreviated design document. The degree of abbreviation varies from project to project.

4. **Comment:** Table 3-4, page 2 of 2, Ex-Situ Treatment, Screening Comments. To be consistent with the other technologies listed in the table, the Screening Comments section for the two Ex-Situ Treatment Technologies should include "Eliminate this technology."

   Response: The suggested text will be added.

5. **Comment:** Appendix C, Table 3, Shaded Row (EPC IS NOT LESS...). This row states "SEE TABLE 1.5"; however, Table 1.5 does not exist in this appendix. Should this reference be to Table 4?

   Response: The reference text will be revised to read "... SEE TABLE 4"

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101

July 27, 2005

Shawn Jorgensen
Naval District Washington, Indian Head
Code HN2SJ, Bldg. 289
101 Strauss Avenue
Indian Head, MD 20640-5035

RE: Draft Final Engineering Evaluation / Cost Analysis for Site 57 – Building 292 TCE Contamination, March 2005

Dear Mr. Jorgensen:

The Federal Facilities Division of the Maryland Department of the Environment's Hazardous Waste Program has no comment on the above referenced document. This document accurately relates the comments previously provided during Indian Head Installation Restoration Team meetings.

If you have any questions, please contact me at (410) 537-3791.

Sincerely,

Curtis DeTore
Remedial Project Manager
Federal Facilities Division

CD:mh

cc: Mr. Dennis Orenshaw
Mr. Jeff Morris
Mr. Horacio Tablada
Mr. Harold L. Dye, Jr.

Morris, Jeffrey CIV (NAVFACWASH)

From: Jorgensen Shawn A IHMD [JorgensenSA@ih.navy.mil]

Sent: Thursday, June 02, 2005 2:17 PM

To: George Latulippe

Cc: Morris, Jeffrey CIV (NAVFACWASH); Kim Turnbull; Dennis Orenshaw; Curtis DeTore; Rail, Joseph CIV (NAVFACWASH)

Subject: RE: Draft Site 57 EECA - Comments

George,

I only have a few comments on the subject document.

1) Page 3-11, Section 3.5.5, second paragraph, last sentence. Should "stream" be "steam", as in "Hot oil or steam circulates through the auger to indirectly heat the medium."

2) Chapter 3, Section 3.5.5 Ex-Situ Treatment. I was surprised not to see Soil Washing/Soil Flushing as a possible treatment for contaminated excavated soil. The following site discusses soil washing, including applicability, limitations, etc.: http://www.frtr.gov/matrix2/section4/4-19.html. One of the limitations is "**Complex waste mixtures (e.g., metals with organics) make formulating washing fluid difficult**," which may be one of the main reasons that you didn't include it. However, I don't know how the cost compares to off-site disposal. If the cost is comparable or less expensive, then it is something that we should look into and include in the EE/CA.

Related Question: If the approximately 606 cubic yards of contaminated soil is sent off-site for disposal, what will the disposal facility do with it, i.e., would it be placed in a hazardous waste landfill because it's an F-listed waste, or would something else be done with it (washing, incineration, other options???)? If the disposal facility will do anything other than landfill the soil, then it may be wise (and cost effective) to look at the technology that they would use and include it as an option for remediating the soil on-site. What I'm thinking here is that it would be better for us to eliminate the problem ourselves, if possible, rather than transfer the problem to someone else (a hazardous waste landfill).

3) Page 4-2, second complete paragraph on page, last sentence. Since this is an EE/CA that is prepared prior to conducting a Removal Action, will there be a "remedial design" phase? I associate remedial designs with final actions. Would using "removal design phase" be an adequate alternative wording, or will it actually just be a work plan that describes the removal action? I think that it's the latter. Therefore, I suggest the following wording for the last sentence: "The actual size, design, and location of the staging area(s) would be determined by the removal action contractor and would be presented in the work plan for the removal action."

4) Table 3-4, page 2 of 2, Ex-Situ Treatment, Screening Comments. To be consistent with the other technologies listed in the table, the Screening Comments section for the two Ex-Situ Treatment Technologies should include "Eliminate this technology."

5) Appendix C, Table 3, Shaded Row (EPC IS NOT LESS...). This row states "SEE TABLE 1.5"; however, Table 1.5 does not exist in this appendix. Should this reference be to Table 4?

If you have any questions on my comments, please let me know.

V/R,
Shawn

-----Original Message-----
From: Morris, Jeffrey CIV (NAVFACWASH) [mailto:jeffrey.w.morris@navy.mil]
Sent: Friday, April 15, 2005 10:34 AM
To: George Latulippe; Kim Turnbull; Dennis Orenshaw; Curtis DeTore; Jorgensen Shawn A IHMD; Rail, Joseph CIV (NAVFACWASH)
Subject: Draft Site 57 EECA - NAVFACWASH Comments

I have no comments other than I noted a typo under the notes for Table 3-1 - "Marlyand" should be "Maryland".

APPENDIX D

COST ESTIMATE

SITE 57 EE/CA

CLIENT: NAVAL DISTRICT WASHINGTON - INDIAN HEAD		JOB NUMBER: 112GN2144 0000.1101
SUBJECT: SITE 57 - BUILDING 292 TCE CONTAMINATION ALTERNATIVE 2 - EXCAVATION AND OFF-SITE DISPOSAL		
BASED ON:		DRAWING NUMBER:
BY: JLM Date: 10-26-04	CHECKED BY: JJR Date: 12/25/04	APPROVED BY: DATE:

OBJECTIVE:
To provide support for the quantities used in the Naval District Washington, Indian Head Site 57 – Building 292 TCE Contamination Cost Estimate for the Engineering Evaluation/Cost Analysis Report.

CALCULATIONS:
This alternative consists of excavation of soil to exposure concentrations below PRGs and off-site hazardous waste disposal. Excavated areas will be backfilled with common fill, covered with topsoil, and revegetated. A portion on the area will be repaved with asphalt. There is a storm sewer and several underground utilities in the excavation area. Any utilities damaged during excavation will be replaced.

Construction Survey

Construction Survey =	Approximate Excavation Areas + 20%	
Areas of Excavation =	2,045	sf
Area of Survey =	2,454	sf
=	0.06	acres

Excavation Areas and Volume

All excavated soil will be hauled to a hazardous waste landfill for disposal. The soil is contaminated with a listed hazardous waste (spent TCE). However, the average TCE concentration in the excavated soil (based on the average of positive TCE detections) is less than the LDR treatment standard for contaminated soil. Therefore, treatment would not be required prior to disposal. From Figure 3-1:

Excavation Area 1 =	1,695	sf
Excavation Area 2 =	225	sf
Excavation Area 3 =	125	sf
Total Excavation Area =	2,045	sf
Depth of Excavation =	8	ft
Volume of Excavation =	16,360	cf
=	606	cy

Time of Excavation

Total Excavation Volume =	606	cy

Assume 16 cy per truck.

Number of Truck Loads =	38	truckloads
Number of Truck Loads/Day =	16	truckloads/day
Number of Days =	3	days
Additional Days for Weather =	4	days
Additional Days for Underground Utilities =	2	days
Total Number of Days =	9	days

CLIENT: NAVAL DISTRICT WASHINGTON - INDIAN HEAD		JOB NUMBER: 112GN2144 0000.1101	
SUBJECT: SITE 57 - BUILDING 292 TCE CONTAMINATION ALTERNATIVE 2 - EXCAVATION AND OFF-SITE DISPOSAL			
BASED ON:		DRAWING NUMBER:	
BY: JLM Date: 10-26-04	CHECKED BY: TJR Date: 12/29/04	APPROVED BY:	DATE:

Waste Characterization Testing (1 per 1,000 cy) = 1 sample

Collect verification samples from the sidewalls and floor of excavation. Assume five samples per area plus three quality control samples.

Number of Samples Per Area =	8	samples
Number of Areas =	3	areas
Confirmation Sampling of VOC/Arsenic =	24	samples

Topsoil

Areas of Excavation =	2,045	sf
Depth of Topsoil =	0.5	ft
Volume of Topsoil =	1,023	cf
=	38	cy

Common Fill

Total Volume of Excavation =	606	cy
Volume of Topsoil =	38	cy
Volume of Common Fill	568	cy

Time of Backfill

Volume of Common Fill =	568	cy
Volume of Topsoil =	38	cy
Total Backfill Volume =	606	cy

Assume 16 cy per truck.

Number of Truck Loads =	38	truckloads
Number of Truck Loads/Day =	40	truckloads/day
Number of Days =	1	days
Additional Days for Weather =	4	days
Total Number of Days =	5	days

Seeding (Assume 1 day)

Seed Area = Approximate Excavation Areas + 20% - Asphalt Area

Areas of Excavation =	2,045	sf
Seed Area =	1,679	sf
=	187	sy

CLIENT: NAVAL DISTRICT WASHINGTON - INDIAN HEAD		JOB NUMBER: 112GN2144 0000.1101	
SUBJECT: SITE 57 - BUILDING 292 TCE CONTAMINATION ALTERNATIVE 2 - EXCAVATION AND OFF-SITE DISPOSAL			
BASED ON:		DRAWING NUMBER:	
BY: JLM	CHECKED BY: TJR	APPROVED BY:	DATE:
Date: 10-26-04	Date: 12/29/04		

Asphalt Repair

Asphalt Repair Area = 775 sf

Underground Utility Replacement

Length of Storm Drain Pipe = 40 ft
Length of Water Line = 45 ft

Approximate Construction Schedule

Activity	Days	
Mobilization	3	
Site Setup	5	
Excavate & Dispose	9	
Backfill	5	
Seed	1	
Demobilization	3	
	26	Days or
Assume	1.5	Months

Institutional controls and 5-year reviews will not be required.

NAVAL DISTRICT WASHINGTON - INDIAN HEAD
Indian Head, Maryland
Site 57 - Former Drum Loading Area
Alternative 2: Excavation and Off-Site Disposal
Capital Cost

Item	Quantity	Unit	Unit Cost				Extended Cost				Subtotal
			Subcontract	Material	Labor	Equipment	Subcontract	Material	Labor	Equipment	
1 PROJECT PLANNING & DOCUMENTS											
1.1 Prepare Documents & Plans Including Permits	500	hr			$25.00		$0	$0	$12,500	$0	$12,500
2 MOBILIZATION/DEMOBILIZATION & SITE SUPPORT											
2.1 Office Trailer	1.5	mo				$325.50	$0	$0	$0	$488	$488
2.2 Field Office Support	1.5	mo				$222.50	$0	$0	$0	$334	$334
2.3 Storage Trailer	1.5	mo				$105.00	$0	$0	$0	$158	$158
2.4 Utility Connection/Disconnection (Phone/Electric)	1	ls	$1,500.00				$1,500	$0	$0	$0	$1,500
2.5 Underground Utility Survey	1	ls	$3,720.00				$3,720	$0	$0	$0	$3,720
2.6 Construction Survey	1	ls	$500.00				$500	$0	$0	$0	$500
2.7 Equipment Mobilization/Demobilization	2	ea			$141.00	$336.00	$0	$0	$282	$672	$954
2.8 Site Utilities	1.5	mo		$327.00			$0	$491	$0	$0	$491
3 DECONTAMINATION											
3.1 Equipment Decon Pad	1	ls		$5,800.00	$6,650.00	$700.00	$0	$5,800	$6,650	$700	$13,150
3.2 Decontamination Services	1	mo		$375.00	$1,200.00	$900.00	$0	$375	$1,200	$900	$2,475
3.3 Decon Water	1,000	gal	$0.20				$200	$0	$0	$0	$200
3.4 Decon Water Storage Tank, 6,000 gallon	1	mo				$635.00	$0	$0	$0	$635	$635
3.5 Clean Water Storage Tank, 4,000 gallon	1	mo				$570.00	$0	$0	$0	$570	$570
3.6 Disposal of Decon Waste (Liquid & Solid)	1	mo	$900.00				$900	$0	$0	$0	$900
4 EXCAVATION AND DISPOSAL											
4.1 Soil Excavation	9	day			$278.40	$683.40	$0	$0	$2,506	$6,151	$8,656
4.2 Transportation/Disposal to Hazardous Landfill	606	cy	$144.00				$87,264	$0	$0	$0	$87,264
4.4 Waste Characterization Testing (1 per 1,000 cy)	1	ea	$820.00	$5.00	$20.00	$10.00	$820	$5	$20	$10	$855
4.5 Verification Sampling (VOC & Arsenic)	24	ea	$155.00	$20.00	$50.00	$20.00	$3,720	$480	$1,200	$480	$5,880
5 BACKFILL AND SITE RESTORATION											
5.1 Import Common Fill	568	cy		$6.80			$0	$3,862	$0	$0	$3,862
5.2 Import Topsoil (6" Thick)	38	cy		$18.23			$0	$693	$0	$0	$693
5.3 Place/Grade/Compact Common Fill and Place Topsoil	5	day			$278.40	$683.40	$0	$0	$1,392	$3,417	$4,809
5.4 Fine Grading & Seeding	187	sy		$0.34	$1.31	$0.21	$0	$64	$245	$39	$348
5.5 Asphalt Repair	775	sf	$1.87				$1,449	$0	$0	$0	$1,449
5.6 Replace Storm Drain Pipe (12" VCP)	40	lf		$9.95	$4.78	$0.76	$0	$398	$191	$30	$620
5.7 Pipe Bedding (2' x 2' x 165')	40	lf		$0.58	$1.01	$0.25	$0	$23	$40	$10	$74
5.8 Replace Water Line (8" DI)	42	lf		$12.35	$9.60	$3.62	$0	$519	$403	$152	$1,074
5.9 Pipe Bedding (1.5' x 1.5' x 85')	42	lf		$0.33	$0.57	$0.14	$0	$14	$24	$6	$44
6 MISCELLANEOUS											
6.1 Construction Oversight (3 people * 26 days)	78	day			$200.00		$0	$0	$15,600	$0	$15,600
Subtotal							$100,073	$12,723	$42,253	$14,752	$169,801
Local Area Adjustments							100.0%	100.0%	100.0%	100.0%	
							$100,073	$12,723	$42,253	$14,752	$169,801
Overhead on Labor Cost @ 30%									$12,676		$12,676
G & A on Labor Cost @ 10%									$4,225		$4,225
G & A on Material Cost @ 10%								$1,272			$1,272
G & A on Subcontract Cost @ 10%							$10,007				$10,007
Total Direct Cost							$110,081	$13,995	$59,155	$14,752	$197,982

NAVAL D[illegible]ICT WASHINGTON - INDIAN HEAD
Indian Head, Maryland
Site 57 - Former Drum Loading Area
Alternative 2: Excavation and Off-Site Disposal
Capital Cost

Item	Quantity	Unit	Unit Cost				Extended Cost				Subtotal
			Subcontract	Material	Labor	Equipment	Subcontract	Material	Labor	Equipment	
Indirects on Total Direct Cost @	35%	(Total Direct Cost Minus Transportation and Disposal Costs)									$38,436
Profit on Total Direct Cost @	10%										$19,798
Subtotal											$256,217
Health & Safety Monitoring @	2%										$5,124
Total Field Cost											$261,341
Contingency on Total Field Costs @	20%										$52,268
Engineering on Total Field Cost @	10%	(Total Field Cost Minus Transportation and Disposal Costs)									$17,318
TOTAL COST											**$330,927**

RESPONSE TO COMMENTS
PRE-DRAFT EE/CA
Site 57 - Building 292 TCE Contamination

Comments from Jeffrey Morris, NAVFAC Washington

Comment 1: Executive Summary, Site Risks, Page ES-1:

The second paragraph states that TCE was identified "greater than background levels". This should probably be changed to "greater than screening levels".

Response:

✓ The first sentence in the identified paragraph now reads, " at concentrations greater than screening levels."

Comment 2: Executive Summary, Site Risks, Page ES-2:

In the last paragraph, third sentence, insert "and" after "installed" so the sentence will read "Two soil borings were installed and samples were collected at various depths."

Response

✓ The identified sentence now reads, "...borings were installed and samples were collected "

Comment 3: Executive Summary, Removal Action Alternatives:

Alternative 2 calls for disposal of removed soil at a landfill – could another possibility to consider be treatment at the site so the soil could be used as backfill? (Section 3.5 evaluates seven alternatives, calling them "technologies" – it seems that, alone or in combinations, these "technologies" would provide more than just no action and excavation w/off-site disposal choices for comparison.)

Response:

Frequently, the convention is to identify each remedial alternative according to the technologies that make up the remedial alternative (e.g., "insitu bioremediation with hot spot removal and disposal"). That convention blurs the distinction between discussions of remediation technologies and discussions of remediation alternatives. The usual distinction is that a remedial alternative is a combination of remedial technologies.

The intent of Section 3.5 is to broadly evaluate remedial technologies to determine which, if any, might be appropriate for inclusion in remedial alternatives. The purpose is to expeditiously focus the document on a reasonably manageable quantity of remedial technologies that are most likely to be successful in mitigating on-site contamination. Evaluating the technologies as stand-alone considerations is more expeditious because inappropriate or less effective technologies can often be discarded on a qualitative basis before defining the details that make up an alternative, and then subjecting the alternatives to a detailed evaluation.

In an effort to clarify the technology evaluations in Section 3.5, the text has been expanded somewhat to bring out the points considered in connection with each technology. Additionally, Table 3-4 has been modified to summarize the technology evaluations in more detail.

Note that, in addition to the characteristics inherent to each technology, there are site characteristics that also affect the technology evaluation. They are:

- A relatively small volume of soil is in need of remediation.
- The soil needing remediation is contaminated with both organic chemicals and metals (i.e., arsenic).

- The below-grade utilities on the site impact the implementability of some technologies.
- Maintenance or replacement of below-grade utilities in the future is complicated and made more expensive by some technologies.

The above items create a situation where technologies that might be attractive for a large site in an open field are not as attractive for the Site 57 source area.

Comment 4: Section 2.2.1, Topography:

The second sentence should be either "...approximately 0 feet above msl" or "...approximately msl". The latter seems better.

Response:

The sentence has been modified to read as follows.

> The valley trends approximately southeast toward Mattawoman Creek to approximately mean sea level.

Comment 5: Figure 2-2:

This figure is extremely cluttered with symbols for various utilities. It appears that the only utility of interest is the storm water pipe. There is also a green dotted line that does not have a description in the key.

Response:

Figures 2-2, 2-3, 2-4, 2-5, and 2-6 will be modified as indicated in the table below.

	Figure 2-2	Figure 2-3	Figure 2-4	Figure 2-5	Figure 2-6
Change the contour interval from 1 foot to 5 feet to reduce apparent congestion	X	X	X	X	X
Remove the utilities from the figure	X				
Add the storm sewer that runs through Site 57 to the figure	X	X	X	X	X
Remove the "green line"	X	X	X	X	X
In Response to Comment 11: the sampling location dots will be color coded to reflect the different sampling rounds.	X	X	X	X	

Comment 6: Figures 2-3, 2-4, 2-5, 2-6:

There is a green dotted line that does not have a description in the key.

Response:

Please refer to the response to Comment 5.

Comment 7: Sections 3.1.1 – 3.1.3:
Why not simply include references to the appropriate tables at the end of each applicable category description and eliminate these sections?

Response:

Sections 3.1.1, 3.1.2, and 3.1.3 have been deleted from the document. Parenthetic references have been added on pages 3-1 and 3-2 at the end of the category descriptions for "Chemical-Specific," Location-Specific," and "Action-Specific" to refer to Tables 3-1, 3-2, and 3-3 respectively.

Comment 8: Section 3.2.1, Removal Action Objectives:
Suggest replacing the first paragraph with "The RAOs for this non-time-critical removal action are:"

Response:

The first paragraph in the section has been modified to read, "The RAOs for this non-time critical removal action are:"

Comment 9: Section 3.2.2 Preliminary Remediation Goals:
The fourth paragraph seems to serve no useful purpose here and could be omitted.

Response:

The fourth paragraph in Section 3.2.2 has been deleted from the document.

Comment 10: Section 3.2.1, Removal Action Objectives:
Page 3-4, first paragraph – Is the array of sample locations an appropriate exposure unit? Figure 2-3 shows sample locations ranging over a wide area, more than that affected by the proposed removal action.

Response:

Defining the exposure unit is very subjective. Generally, people tend to move over a site and not stand repeatedly in a single spot for a significant duration, resulting in an averaging effect with respect to exposure to soil contamination. The difficult part is to determine how wide an area people encounter as they move across the site. It is important to note that the exposure unit is not strictly defined by the extent of unacceptable contamination, but rather by the extent of personnel movement in the area. In many situations, as with the Site 57 source area, the extent of the contaminated area occupies only a portion of the overall area where personnel are exposed to soil, contaminated or not.

The horizontal extent of the exposure unit for remediation of the Site 57 source area is certainly open for discussion. The area described in the document was intended to "capture" the area over which personnel would be expected to move on a reasonably routine basis. Certainly others may have different views on that topic. The matter may be one that is appropriate for discussion by the IHIRT (at a meeting or during a conference call). Pending further discussion regarding the definition of the extent of the exposure unit, no modifications have been made to the Site 57 EE/CA.

Comment 11: Section 3.5, Technology Screening:

This section, as mentioned in the previous comment on remedial action alternatives, might be of more value if the "technologies" were considered as, or part of, actual alternatives. Recognizing that what happened was that the screening (i.e. recommendation) occurred in this section, the current choice between no action and Alternative 2 still is no choice at all, giving the EE/CA process the appearance of fraud.

Response:

The authors take exception to the use of the word "fraud", "appearance" or otherwise. The view of the authors is that evaluating technologies before defining remedial alternatives is an efficient way to prepare the document while keeping with the intent of an EE/CA. The EPA's "Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA" describes one of the goals of an EE/CA as, "Provide a framework for evaluating and selecting alternative technologies." In the case of a site where an RI has been completed, the same guidance describes an EE/CA as being "similar to a focused FS, concentrating on the analysis of perhaps two or three appropriate alternatives and providing reference to existing information on the nature and extent of contamination and risks." The guidance also indicates, "Thus, an EE/CA serves an analogous function, but is more streamlined than the RI/FS conducted for remedial actions."

The authors submit that a "fraudulent" document would be far more likely to attempt to avoid an active remediation of the Site 57 source area, where as this document attempts to examine a variety of options at an appropriate level of detail before settling on the excavation and off-site disposal option.

The evaluation of technologies in the EE/CA assumes a preference for remediating the site so as to allow unrestricted use in the future. This consideration is not explicitly stated in the Remedial Action Objectives (Section 3.2.1), but adding it may help support the elimination or retention of technologies during the evaluation process and mitigate the "appearance of fraud." Note that the revised text in Attachment 1 to this response to comments attempts to make it more obvious that the presence or absence of future use restrictions is a consideration.

That said, the authors are certainly open to the direction to add "alternatives" to the document. However, pending that direction, no additional alternatives or remedial action objectives have been added to the document at this time.

Comments from Shawn Jorgensen, NDW-IH

Comment 12: Page 2-4, Section 2.3.2, second paragraph:

This paragraph refers to Figure 2-3 as showing the soil-gas locations, such as SG-02 and SG-07, which are discussed in the paragraph of this section. However, Figure 2-3 does not contain sample locations beginning with SG. It appears that sample SG-07 referred to in the third paragraph may actually be SO-07 on the figure. However, I don't see an SO-02 on the figure.

Also, Figure 2-4 appears to have soil-gas samples. The sample SG-02 referred to in the third paragraph of this section appears to be sample location SO-07 in Figure 2-4. Likewise, sample SG-07 appears to be sample location SO-09 in Figure 2-4. Please clarify the differences.

Response:

The authors agree that the multiple designations for samples/sample locations are confusing. The confusion originates with the fact that multiple sample types (soil gas, soil, and groundwater) were collected from the same location, and the distinctions were not made clear as the information was moved into the EE/CA document.

In the EE/CA, the soil analytical results are the data of interest. The matter of samples and sample locations will be clarified by confining the text and the labels on the figures to the soil sample designations such as "SO-07". The legend on Figure 2-4 will be modified to change "Soil-Gas Sample Location" to "Soil Sample Location."

The third paragraph in Section 2.3.2 will be modified to read as follows:

> Concerning regulatory compliance, emphasis was placed on the EPA Soil Screening Level (SSL) for TCE concentrations in soil that could result in unacceptable contaminant migration to groundwater. The EPA SSL of 60 micrograms per kilogram (µg/kg) was exceeded by all the shallow soil samples collected, with a maximum concentration of 840,000 µg/kg detected in sample SO-07 at 2 to 4 feet bgs. The SSL was exceeded by a single deep soil sample (150 µg/kg in sample SO-10 from 10 to 12 feet bgs) which was collected at the same location exhibiting the second highest TCE concentration in shallow soil (9,300 µg/kg in sample SO-09 from 2 to 4 feet bgs).

Comment 13: Sections 2.3.4 (RI) and 2.3.5 (Pre-FS Investigation):

Both refer to Figure 2-3 for the sample locations for both sampling events. However, I do not see a way to distinguish between the two sampling events on the figure. Am I missing something? I suggest either using different color dots on the figure to help distinguish between sampling events (this includes the soil-gas survey locations, too, I think, per Section 2.3.2) or include a list or table of samples taken in the text of each section.

Response:

Please refer the response to Comment 5. The figures will be modified to use colors to distinguish among the various sampling events.

Comment 14: General comment:

Two items were not mentioned in the document, but I'm not certain that they need to be. I just want to bring them to everyone's attention.

> a) You may recall that a dock extension was added to the front of Building 292. The RAC prepared the site for the dock extension by removing contaminated soil directly in front of the building near where the highest concentrations of TCE were located (approximately 4 feet deep so footers could be installed), put down plastic, and put fill in so the construction contractor could install footers and the dock extension. This could have changed, and probably did change, concentrations of TCE in the area near Building 292. Also, please note that the dock extension is not shown on any of the drawings, which I think is a failure in our (NDW-IH) GIS building layer.
>
> b) The second item is the relining of approximately 750 feet of storm sewer pipe that TCE contaminated shallow groundwater was infiltrating, plus the relining of two smaller pipes that emanate from Building 292 (one inside and one next to the building) and discharge into Manhole 1 (MH-1). Although the infiltration of TCE contaminated shallow groundwater is still occurring, it is occurring at a slower rate.

Response:

For 12 a: Given that the soil removed during construction of the loading dock was among the more contaminated soil, the area shown on Figure 3-1 as requiring excavation may be larger than it would be if current (since loading dock construction) soil contaminant concentrations had been used in the statistical calculations that defined the excavation area. From another perspective, the removal of contaminated soil during loading dock construction will not result in the excavation area on Figure 3-1 being too small. In any event, the remediation activity will need to include verification sampling and rerunning the calculations used in the EE/CA to verify that sufficient contamination has been removed from the site. Because the presence of the loading dock will not affect the evaluations in the EE/CA, the figures have not been modified to add the loading dock pending direction to the contrary. Of course, any design drawings prepared for the remediation contract should reflect the loading dock.

For 12 b: The comment is noted. At this point it is intended that excavation will occur around the existing below-grade utilities. That approach should not be affected by the fact that the storm sewers are lined.

ATTACHMENT 1

3.5 TECHNOLOGY SCREENING

This section screens technologies for soil based on the criteria of effectiveness, implementability, and cost, as detailed below. Screening evaluations at this stage generally focus on effectiveness and implementability, with less emphasis on cost.

Effectiveness

Effectiveness is evaluated based on the following criteria:

- Ability of the technology to address the estimated areas or volumes of the contaminated medium
- Ability of the technology to meet the RAOs
- Technical reliability (innovative versus well proven) with respect to contaminants and site conditions
- Potential impacts to human health and the environment during implementation

Implementability

Implementability is evaluated based on the following criteria:

- Overall technical feasibility at the site
- Availability of vendors, mobile units, storage, disposal services, etc.
- Administrative feasibility

Cost

Cost is evaluated based on the following criteria:

- Capital costs
- Operation and maintenance (O&M) costs

3.5.1 No Action

Under no action, neither a removal action nor periodic maintenance is undertaken at the site.

Effectiveness

No action would not protect human health or the environment because it would allow contaminated soil to remain at the site. Human receptors could contact contaminated soil, and the soil would be a continuing source of groundwater contamination.

No action is not reliable because it would not remove the contamination from the site.

Implementability

No action is technically and administratively feasible at the site. The availability of vendors, mobile units, storage, disposal services, etc. is not applicable.

Cost

There are no costs for this technology.

Conclusion

No action is implementable, but it is not effective. However, no action will be retained as a baseline for comparison to other options.

3.5.2 Containment

The technologies being considered for containment include capping and vertical barriers.

Caps and covers can minimize the potential for human contact with surface and subsurface soil. They can also reduce the migration of contaminants caused by surface water infiltration, runoff, and wind erosion. Soil covers consist of a layer of soil or clay placed or compacted over areas of soil contamination. Asphalt caps consist of a layer of asphalt placed over areas of soil contamination where vehicular access must be maintained. Multimedia caps (engineered caps) consist of layers of soil, synthetic materials, and/or composite materials placed or compacted over areas of soil contamination.

Vertical barriers consist of slurry walls, grout curtains, sheet piling, etc. that are used to minimize the horizontal migration of contaminants, especially within the saturated zone. The barriers are placed around or downgradient of areas of contamination and extend from the ground surface to at least the bottom of the contamination and very commonly into a confining layer. The selection of the type of barrier depends on site-specific conditions, including compatibility of the barrier with subsurface conditions and contaminants.

Effectiveness

Soil covers, asphalt caps, and multimedia caps can be effective in minimizing human exposure to contaminated surface and subsurface soil. The use of low-permeability materials such as compacted clay, synthetic membranes, or composite materials would be effective in minimizing rainfall infiltration into the contaminated material beneath the cover.

The use of vertical barriers may be considered if horizontal migration of saturated subsurface soil (and groundwater) contaminants is a potential concern. They are less effective for contamination above the water table. Slurry walls are more commonly used than ground curtains and sheet piling and may be more effective in coarser soils. *The very nature of vertical barriers (i.e., installed below-grade) makes it very difficult to effectively monitor their continuing effectiveness since leaks are very difficult to identify, locate, and repair.*

Implementability

The main concern with the implementation of caps is the maintenance of the integrity of the cap from natural and human interferences. The area around Site 57 is an active facility with a roadway that is frequently used. The activities conducted there (primarily vehicular traffic) could damage a soil cover or cap unless contaminated areas were covered with pavement or concrete. In addition, the cap system would need to retain the existing topography and grades near Building 292. *Cap installation would require the disposal of soil excavated to a depth of approximately 2.5* *feet under the area to be capped in order to accommodate the various layers necessary for establishing an impermeable cap using a synthetic membrane.*

The use of vertical barriers must consider the control of water-table levels within the contained area and could cause an increase in upgradient groundwater elevations. Maintenance of the integrity of vertical barriers is difficult over the long term. *The presence of below-grade utilities on the site complicates the installation of vertical barrier, and requires penetrations through the barrier to maintain utility service. Future utility maintenance would be more costly when the vertical barrier is affected by the need to perform maintenance on the existing utilities or the need to install new or replacement utilities.*

Cost

Costs for soil covers and asphalt caps are low to moderate. Costs for engineered caps are moderate to high, depending on the materials and labor involved in placement. Costs of vertical barriers are moderate for slurry walls and sheet piling but high for grout curtains. *The costs for vertical barriers tend to increase where below-grade utilities must be accommodated.*

Conclusions

An asphalt cap underlain by a synthetic membrane and vertical barriers to reduce horizontal migration of soil contaminants are eliminated from further consideration. Although containment of the site is an effective means of minimizing exposure to human receptors and restricting infiltration, it does not allow unrestricted use of the land following implementation.

3.5.3 Excavation

Excavation can be performed by various types of equipment such as front-end loaders, backhoes, grade-alls, etc. The type of equipment selected must take into consideration several factors such as the type of material to be removed, the load-bearing capacity of the ground surrounding the removal area, the depth and aerial extent of removal, the required rate of removal, and the elevation of the groundwater table. Excavation is the technology of choice for the removal of well-consolidated material such as soil to a depth of up to 30 feet.

The logistics of excavation must take into account the available space for operating the equipment, loading and unloading of the excavated material, location of the site, etc. After excavation is completed, the location is filled and graded with clean fill material or treated soils.

Effectiveness

Excavation is a well-proven and effective method of removing contaminated material from a site. Sampling is typically required to verify the effectiveness of the removal action. Excavation would not be expected to have short-term impacts on the community or environment. Any dust that would be generated could be adequately controlled. Erosion and sedimentation controls would be needed to control off-site migration of soil contaminants. Excavation would expose workers to contaminants during the implementation phase, although exposure would be minimized through the use of proper health and safety procedures. Excavation would provide protection of human health and the environment at the site for the long term because contaminated material would be removed from the site. The excavated material would require further treatment and/or disposal.

Implementability

Excavation of contaminated soil at Site 57 would be implementable; however, the presence of underground utilities needs to be considered so they are not damaged. *Below-grade utilities would need to be accommodated for the duration of the remedial activity. No special post-*

remediation utility considerations apply into the future. Excavation equipment is readily available from multiple vendors. This technology is well proven and established in the construction and remediation industry. During excavation, site-specific health and safety procedures and Occupational Safety and Health Administration (OSHA) regulations would have to be complied with to ensure that the exposure of workers to COCs is minimized.

Cost

The cost of excavation at Site 57 would be low to moderate.

Conclusion

Excavation is retained in combination with other process options for the development of removal action alternatives. *It permanently removes the contamination from the site.* Its *cost effectiveness improves as soil volumes decrease;* and future *utility maintenance, replacement,* and *installation are not a factor.*

3.5.4 In-Situ Treatment

The process options considered under in-situ treatment are *soil vapor extraction (*SVE*)* and multi-phase extraction (MPE).

SVE is a process that physically removes contaminants by inducing air flow by applying a vacuum to extraction wells screened in the saturated zone. VOCs tend to partition into air as the air moves through the soil to the extraction wells. The gas leaving the soil may be treated to recover or destroy the contaminants, depending on air discharge regulations. SVE is one of the presumptive remedies identified by EPA where VOCs are present in soil.

MPE is an enhancement of the SVE option under the presumptive remedy for sites with VOCs in soil. MPE simultaneously extracts both groundwater and soil vapor. The water table is lowered so that the SVE process can be applied to the newly exposed soil. This allows the VOCs sorbed on the previously saturated soil to be stripped by the induced airflow and extracted. In addition, soluble VOCs present in the extracted groundwater are also removed.

Effectiveness

SVE is a well-demonstrated technique for removing VOCs from the vadose zone (i.e., above the water table) *on sites with suitable subsurface soil permeability.* It may not be as effective at sites with low-permeability soils. It is not effective for most polynuclear aromatic hydrocarbons (PAHs) or metals. A draft EE/CA was prepared in 1998 to determine the most effective approach for addressing TCE contamination in soil at Site 57 (B&R Environmental, 1998). The EE/CA recommended SVE. Subsequently, a pilot study was conducted at Site 57 to verify the suitability of the site for application of the SVE process. The pilot study demonstrated that the site is not suitable for SVE (B&R Environmental, 1997).

MPE has proven to be more effective at removing subsurface VOCs at low- to moderate-permeability sites than conventional pump-and-treat and SVE systems alone. It can remove contaminants from above and below the water table. It is not effective for metals.

Implementability

SVE is a readily available conventional process that has been used at numerous Superfund sites. Air pollution controls may be required. There may be operational problems if the air extraction wells are screened near the water table. The depth to the water table near Building 292 is approximately 8 feet.

MPE is an innovative process that has been applied at dozens of sites. Air pollution controls may be needed. The aquifer must be able to be dewatered for MPE to be successful. Although some transfer of VOCs from groundwater to the vapor phase is expected, extracted groundwater may need to be further treated prior to discharge. Air pollution controls may be required.

Neither technology addresses metal contamination.

Treatability studies would be required for both of these treatment processes.

Cost

The cost of SVE is low. Costs for MPE would be higher because additional equipment would be needed, *groundwater dewatering would be necessary (requiring the need for a sheet piling wall, a slurry wall, or well points), and the extracted groundwater would require treatment.* ~~MPE costs also depend on the amount of extracted groundwater that would require treatment.~~

Conclusion

SVE for removal of VOCs from vadose zone soil is eliminated because of effectiveness concerns identified during the previous pilot study. MPE is also eliminated because of effectiveness concerns for the SVE part of the MPE process. *Additionally,* MPE is more *equipment and process (i.e., dewatering) intensive than SVE.*~~appropriate for simultaneous treatment of soil and groundwater rather than for soil only.~~ *Neither process is suitable for treating metals contamination.*

3.5.5 Ex-Situ Treatment

The process option considered under ex-situ treatment is low-temperature thermal desorption.

Low-temperature thermal desorption is a physical separation process that treats wastes at 200 to 600 degrees Fahrenheit (°F) to volatilize water and organic contaminants. A carrier gas or vacuum system transports volatilized water and organic contaminants to a gas treatment system. The bed temperatures and residence times will volatilize selected contaminants but typically will not oxidize or destroy them. Two common thermal desorption designs are the rotary dryer and thermal screw. Rotary dryers are horizontal cylinders that can be indirect or direct fired. The dryer is normally inclined and rotated. For thermal screw units, screw conveyors or hollow augers are used to transport the medium through an enclosed trough. Hot oil or stream circulates through the auger to indirectly heat the medium.

Effectiveness

Thermal desorption should be effective at volatilizing the VOCs of concern. It is not effective for metals. Contaminant destruction efficiencies in the afterburners of these units are greater than 95 percent. The same equipment could probably meet stricter requirements with minor modifications, if necessary. Decontaminated soil could be used as backfill if PRGs are met or it can be transported to an off-site landfill.

Implementability

Low-temperature thermal desorption is an innovative process that is being used more often. Full-scale and mobile units are available. All thermal desorption systems require treatment of the off-gas to remove particulates and contaminants. Dewatering may be necessary to achieve acceptable soil moisture content. Heavy metals in the feed may produce a solid residue that requires further treatment or disposal. On-site thermal desorption would be preferred over off-site treatment because the soil could be used to backfill excavated areas, assuming that soil PRGs can be attained.

Costs

The relative cost of low-temperature thermal desorption is low to moderate. However, mobilization costs would be relatively high for smaller volumes of soil.

Conclusion

Low-temperature thermal desorption would be effective and implementable for removing VOCs; however, it is not effective for metals. The relatively small volume of contaminated soil would not justify mobilization of on-site treatment equipment. In addition, the treated soil would contain arsenic at concentrations greater than PRGs, which could preclude the soil's use as backfill in the excavation(s). Therefore, this process is eliminated from consideration.

3.5.6 Off-Site Disposal

Disposal in an off-site hazardous waste or nonhazardous waste landfill is an effective technology and can be easily implemented if volumes are not excessive. This technology requires excavation, loading, and hauling of contaminated soil to an approved facility for final disposal. All contaminated material can be disposed at a properly permitted facility.

Effectiveness

Off-site disposal is a very effective long-term disposal action for contaminated soil. Off-site disposal would provide long-term protection of human health and the environment. After the contamination is removed, there would not be unacceptable residual risks. Off-site transport of a large volume of contaminated material could impact the community (e.g., increased traffic, potential for spills). Off-site disposal is a very reliable removal action because the contaminated materials are removed from the facility and O&M activities are not required.

Implementability

Off-site disposal is implementable because facilities with adequate capacity are available.

Cost

The capital cost associated with off-site disposal is medium to high depending on the waste classification. There are no O&M costs associated with this technology.

Conclusion

Off-site disposal is *readily implemented, and requires no post-remedial monitoring or maintenance. For small volumes of soil, it is cost competitive. It is* retained in combination with other process options for the development of removal action alternatives.

3.5.7 Institutional Controls and Monitoring

Institutional controls consist of administrative (non-engineering) controls and procedures to limit access to and activities at a site. A monitoring program, subject to regulatory approval, would be developed that would include routine sampling and analysis of environmental media and additional sampling to further evaluate risk and to monitor potential migration of soil contaminants.

Effectiveness

Prohibiting residential development and the development of facilities in which children would be exposed would prevent the occurrence of unacceptable risks from direct exposure by human receptors. The control of work permits would limit exposure to on-site workers. However, the effectiveness of institutional controls is dependent on the long-term enforcement of a land use control plan. Institutional controls would not be effective in reducing the migration of soil contaminants to groundwater

Implementability

Institutional controls would be readily implemented. A land use control plan can be readily developed and enforced by existing departments at NDW-IH. Monitoring programs are readily developed and implemented.

Cost

The capital cost for institutional controls and monitoring would be low. Operating costs will be low to moderate, but the need for enforcement of the land use controls and monitoring could be indefinite.

Conclusion

Institutional controls and monitoring are eliminated from further consideration because institutional controls and monitoring do not allow unrestricted use of the land following implementation and would not effectively reduce contaminant migration from soil to groundwater.

TABLE 3-4

TECHNOLOGY SCREENING
SITE 57- BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND
PAGE 14 OF 16

Technology	Process Options	Description	Screening Comments
No Action	Not applicable	No activities conducted to address contamination.	Required by NCP. Retain for baseline comparison.
Containment	Capping (Clay, synthetic membrane, asphalt, or multimedia cap)	Low-permeability barriers to minimize exposure to contaminants and contaminant migration to groundwater.	High vehicular and pedestrian traffic results in the need for periodic maintenance the frequency of which depends on the cap material. Leaving the contaminated soil in place restricts the potential uses of the site and requires periodic inspections. Installing a cap requires excavating and disposing of soil under the area to be capped if existing grades are to be maintained. Eliminate this technology.
	Vertical Barriers (Slurry wall, grout curtain, and sheet piling)	Low-permeability barriers to restrict horizontal migration of contaminants.	Long-term effectiveness is difficult to monitor and difficult to repair once leaks are detected. Installation at this site is complicated by the presence of below-grade utilities. Below grade utilities must be accommodated by penetrations which are susceptible to leaking. Future utility repairs and installation are complicated and made more expensive by the vertical barrier. Leaving contamination in place restricts the potential uses of the site and requires periodic inspections. Eliminate this technology.
Excavation	Excavation	Use of common construction equipment to remove contaminated soil.	Easily implemented although care is required to protect existing utilities. Once the remediation is completed, utilities are no longer a consideration. No restrictions are needed on site use, and no post-remediation periodic inspections are required. Well suited to small soil volumes. Retain this technology.

Technology	Process Options	Description	Screening Comments
In-Situ Treatment	Soil vapor extraction (SVE)	Use of vacuum and/or air sparging to volatilize and remove contaminants from the vadose zone.	An SVE pilot study demonstrated that site soil above the groundwater table exhibited little to no permeability. SVE does not address metals contamination. Eliminate this technology.
	Multi-phase extraction (MPE)	Use of vacuum and pumping to volatilize and remove contaminants from above and below the water table.	An SVE pilot study demonstrated that site soil above the groundwater table exhibited little to no permeability. MPE does not address metals contamination. Additional costs are required to treat extracted groundwater. Eliminate this technology.
Ex-Situ Treatment	Low-temperature thermal desorption	Use of low to moderate temperatures to volatilize contaminants.	Does not avoid the need to excavate contaminated soil. Mobilization costs are relatively high for small soil volumes. This technology is not effective for metals. Residual arsenic concentrations would preclude using the treated soil for backfill material.
	Incineration	Use of high temperature to destroy organic contaminants.	Does not avoid the need to excavate contaminated soil. Mobilization costs are relatively high for small soil volumes. This technology is not effective for arsenic. Residual arsenic concentrations would preclude using the treated soil for backfill material.

TABLE 3-4

TECHNOLOGY SCREENING
SITE 57- BUILDING 292 TCE CONTAMINATION
NDW-IH, INDIAN HEAD, MARYLAND

Technology	Process Options	Description	Screening Comments
Off-Site Disposal	Landfill (Hazardous or nonhazardous waste landfill)	Disposal of excavated material at a permitted on-site or off-site landfill.	Below-grade utilities require care during excavation, but there are no post-remediation utility concerns with respect to maintenance, repair, or installation of utilities. There are no post-remediation restrictions on the use of the site. Cost is reasonable for small soil volumes. Retain this technology.

NAVFAC Washington Comments on Draft EE/CA For Site 57 (Building 292 TCE Contamination) Prepared by Jeff Morris January 31, 2005

These comments were generated following review of the draft EE/CA for Site 57 (Building 292 TCE Contamination).

General

Section 3.5 evaluates seven alternatives, calling them "technologies" - it seems that, alone or in combinations, these "technologies" would provide more than just no action and excavation w/off-site disposal choices for comparison. For example, excavation with ex-situ treatment or capping with ICs could be other alternatives to use for comparison. The reason two of the "technologies" were dropped was the failure to meet unrestricted use criteria, which probably shouldn't be a reason for elimination until all actual alternatives are compared. Recognizing that what happened was that the screening (i.e. analysis) occurred in Section 3.5, the current choice between no action and Alternative 2 still is no choice at all, giving the EE/CA process the appearance of fraud. At the very least, a true comparison between excavation w/disposal and excavation w/ex-situ treatment (where the soil could be used for backfill) would be interesting.

Executive Summary

Site Risks

Page ES-1 - The second paragraph states that TCE was identified "greater than background levels". This should probably be changed to "greater than screening levels".

Page ES-2 - In the last paragraph, third sentence, insert "and" after "installed" so the sentence will read "Two soil borings were installed and samples were collected at various depths."

Removal Action Alternatives

See General comment.

2.2.1 Topography

The second sentence should be either "...approximately 0 feet above msl" or "...approximately msl".

Figure 2-2

This figure is extremely cluttered with symbols for various utilities. It appears that the only utility of interest is the storm water pipe. There is also a green dotted line that does not have a description in the key.

Figures 2-3, 2-4, 2-5, 2-6 (and 3-1)

There is a green dotted line that does not have a description in the key.

3.1.1 – 3.1.3

Why not simply include references to the appropriate tables at the end of each applicable category description and eliminate these sections?

3.2.1 Removal Action Objectives

Suggest replacing the first paragraph with "The RAOs for this non-time-critical removal action are:"

3.2.2 Preliminary Remediation Goals

The fourth paragraph seems to serve no useful purpose here and could be omitted.

3.2.1 Removal Action Objectives

Page 3-4, first paragraph – Is the array of sample locations an appropriate exposure unit? Figure 2-3 shows sample locations ranging over a wide area, more than that affected by the proposed removal action. Some clarification is probably needed.

3.5 Technology Screening

This section, as mentioned in the General comment on remedial action alternatives, might be of more value if the "technologies" were considered as, or part of, actual alternatives. As it is, they are presented as if this would occur, then a leap is made to just two (one really) alternatives in Section 4. It may be better to integrate Section 3.5 into Section 4.

Table 3-4

This table is affected by previous comments.

4.0 Identification and Analysis of Removal Action Alternatives

This Section is affected by previous comments.

5.0 Comparative Analysis of Removal Action Alternatives

This Section is affected by previous comments.

TETRA TECH NUS, INC.
661 Andersen Drive • Pittsburgh, PA 15220
Tel 412.921.7090 • Fax 412.921.4040 • www.tetratech.com

PITT-03-5-035

March 22, 2005

Project Number 2144

Commanding Officer
Naval Facilities Engineering Command
Engineering Field Activity Chesapeake
1314 Harwood Street, S.E.
Washington Navy Yard, DC 20374
ATTN: Mr. Jeffrey W. Morris (OBP1E)

Reference: CLEAN Contract No. N62472-03-D-0057
Contract Task Order No. 005

Subject: Naval District Washington, Indian Head
Draft Engineering Evaluation/Cost Analysis
Site 57 – Building 292 TCE Contamination

Dear Mr. Morris:

Forwarded herewith are two (2) copies of the draft Engineering Evaluation/Cost Analysis (EE/CA) for Site 57, Building 292 TCE Contamination, at the Naval District Washington, Indian Head, Indian Head, Maryland.

By a copy of this letter, copies are being forwarded to others as follows:

Shawn Jorgensen, HDW-IH	3 copies
Dennis Orenshaw, EPA Region 3	2 copies
Curtis DeTore, MDE	1 copy

Comments on the document are requested by May 23, 2005.

If you have any questions regarding the document, please contact me at 412-921-8684.

Sincerely,

George J. Latulippe, P.E.
Project Manager

GJL/kf
Enclosure

cc: Mr. Roger Boucher, NORTHDIV (w/o enclosures)
Mr. John Trepanowski, P.E., Tetra Tech NUS, King of Prussia
Project File 2144