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NSWC WHITE OAK
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Section: 02.02
Site 20903-5640 (White Oak)
Doc. #: 0005
00064

Engineering Evaluation/Cost Analysis Work Plans

for

Site 1 and Site 28

former

Naval Surface Warfare Center

White Oak

Silver Spring, Maryland

Engineering Field Activity Chesapeake

Naval Facilities Engineering Command

Contract Number N62472-90-D-1298

Contract Task Order 0315

March 1999

TETRA TECH NUS, INC.

Section: 02.02
Site 20903-5640 (White Oak)
Doc. #: 0005

099809/P

ENGINEERING EVALUATION/COST ANALYSIS WORK PLANS FOR SITE 1 AND SITE 28

FORMER NAVAL SURFACE WARFARE CENTER, WHITE OAK SILVER SPRING, MARYLAND

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Engineering Field Activity Chesapeake
Environmental Branch Code 18
Naval Facilities Engineering Command
Washington Navy Yard, Building 212
Washington, D.C. 20374-2121

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

CONTRACT NUMBER N62472-90-D-1298
CONTRACT TASK ORDER 0315

MARCH 1999

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TABLE OF CONTENTS

TAB

FIELD SAMPLING PLAN

QUALITY ASSURANCE PROJECT PLAN

HEALTH AND SAFETY PLAN

Engineering Evaluation/Cost Analysis Field Sampling Plan

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Naval Surface Warfare Center

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Engineering Field Activity Chesapeake

Naval Facilities Engineering Command

Contract Number N62472-90-D-1298

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099809/P

ENGINEERING EVALUATION/COST ANALYSIS FIELD SAMPLING PLAN FOR SITE 1 AND SITE 28

FORMER
NAVAL SURFACE WARFARE CENTER, WHITE OAK
SILVER SPRING, MARYLAND

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TABLE OF CONTENTS

SECTION		PAGE
ACRONYM LIST		**iv**
1.0	**INTRODUCTION**	**1-1**
1.1	FACILITY LOCATION AND SITE DESCRIPTIONS	1-1
1.1.1	Site 1 - Parking Lot Landfill	1-1
1.1.2	Site 28 - Building T-14 Scrapyard	1-6
1.2	NATURE AND EXTENT OF CONTAMINATION	1-8
1.2.1	Site 1 – Parking Lot Landfill	1-8
1.2.2	Site 28 – Building T-14 Scrapyard	1-11
1.3	REPORT ORGANIZATION	1-11
2.0	**SCOPE OF WORK**	**2-1**
2.1	SITE 1 - PARKING LOT LANDFILL	2-1
2.2	SITE 28 - BUILDING T-14 SCRAPYARD	2-7
2.3	PROJECT SCHEDULE	2-7
3.0	**FIELD ACTIVITIES AND PROCEDURES**	**3-1**
3.1	MOBILIZATION/DEMOBILIZATION	3-1
3.2	TEST PITS	3-2
3.3	SOIL AND SEDIMENT SAMPLING	3-2
3.4	SAMPLE HANDLING	3-2
3.5	SAMPLE CUSTODY	3-7
3.6	DECONTAMINATION	3-7
3.7	EQUIPMENT CALIBRATION	3-7
3.8	IDW HANDLING	3-7
3.9	FIELD SURVEY	3-8
REFERENCES		**R-1**

APPENDICES

- **A SITE PHOTOGRAPHS**
- **B SITE 1 SOIL AND GROUNDWATER DATA**
- **C SITE 28 SOIL DATA**

TABLES

NUMBER		PAGE NO.
2-1	Proposed Sampling Rationale	2-2
2-2	Summary of QA/QC Samples and Analysis	2-3
3-1	Summary of Proposed Sampling - Site 1	3-3
3-2	Summary of Proposed Sampling - Site 28	3-5
3-3	Requirements for Sample Bottleware, Preservation, and Holding Time	3-6

FIGURES

NUMBER		PAGE NO.
1-1	Site Vicinity Map	1-3
1-2	Site Location Map	1-5
1-3	Site Map - Site 1	1-7
1-4	Site Map - Site 28	1-9
1-5	Analytical Data – Surface Soil – Site 1	1-11
1-6	Analytical Data – Unfiltered Groundwater – Site 1	
1-7	Analytical Data – Surface Soil – Site 28	1-13
1-8	Analytical Data – Subsurface Soil – Site 28	1-14
2-1	Proposed Sampling Plan – Site 1	2-5
2-2	Proposed Sampling Plan – Site 28	2-8
2-3	Project Schedule	2-9

ACRONYMS

ALC	Adelphi Laboratory Center
B&R	Brown & Root
bgs	below ground surface
CLEAN	Comprehensive Long-Term Environmental Action Navy
COMAR	Code of Maryland Regulations
CTO	Contract Task Order
EE/CA	engineering evaluation/cost analysis
FID	flame ionization detector
FSP	field sampling plan
HASP	health and safety plan
IDW	investigation-derived waste
IRP	Installation Restoration Program
NPDES	National Pollutant Discharge Elimination System
NSWC	Naval Surface Warfare Center
PAH	Polyaromatic hydrocarbon
PID	photoionization detector
PPE	personal protective equipment
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
RBC	risk based concentration
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RI	Remedial Investigation
SOP	standard operating procedure
SVOC	semi-volatile organic compound
SWMU	solid waste management unit
TtNUS	Tetra Tech NUS
EPA	Environmental Protection Agency
UXO	unexploded ordnance
VOC	volatile organic compound

1.0 INTRODUCTION

The Northern Division of the Naval Facilities Engineering Command has issued Contract Task Order (CTO) 315 to Tetra Tech NUS (TtNUS) under Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract No. N62472-90-D-1298. Under CTO 315, TtNUS is to perform an Engineering Evaluation/Cost Analysis (EE/CA) for Installation Restoration Program (IRP) Sites 1 and 28 at the former Naval Surface Warfare Center (NSWC) White Oak, located in Silver Spring, Maryland. This field sampling plan (FSP) was prepared to outline procedures to be used to perform field work in support of the EE/CA. The EE/CA will address the removal of contaminants and sources of contamination from the surface and subsurface soil. Groundwater remediation (if necessary) will not be addressed within this EE/CA.

The FSP is intended to be used in conjunction with a project-specific health and safety plan (HASP) and quality assurance project plan (QAPP) submitted with the FSP, as well as the existing Master Work Plans for NSWC-White Oak (B&R Environmental, 1998a).

1.1 FACILITY LOCATION AND SITE DESCRIPTIONS

NSWC-White Oak was previously a Navy-owned and -operated laboratory for naval surface warfare research. It is located north of Washington, D.C., off New Hampshire Avenue in Silver Spring, Maryland (see Figure 1-1). The former NSWC-White Oak property covers approximately 710 acres and is located in both Prince George's and Montgomery Counties. Adjacent to the southern end of the property is the U.S. Army's Adelphi Laboratory Center (ALC). NSWC-White Oak was closed in 1997 and the property has been transferred to the General Services Administration and the ALC. Descriptions of the two sites to be addressed in the EE/CA follow. Site locations are shown on Figure 1-2.

1.1.1 Site 1 - Parking Lot Landfill

The Parking Lot Landfill was used as an open disposal site and landfill between 1948 and 1953. The site is located east of Building 110 and is adjacent to the Apple Orchard Landfill (IRP Site 2) and Site 32 (NPDES Outfall 0009) (Figure 1-3). The site was identified as an IRP Site by the Navy in 1984 and as a solid waste management unit (SWMU) by the United States Environmental Protection Agency (EPA) during the Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) in 1990 (Kearney/Centaur Division, 1990).

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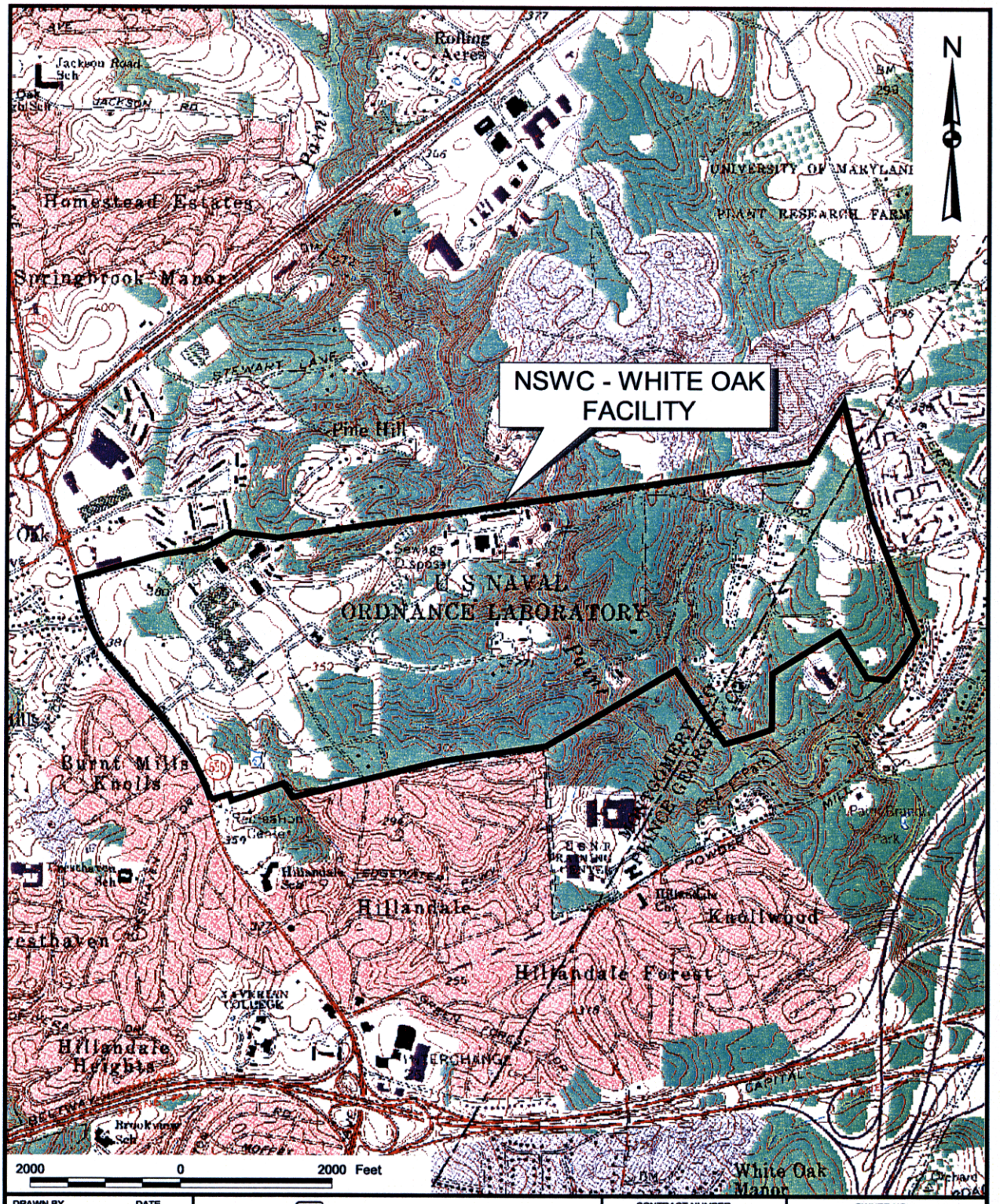

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CHECKED BY	DATE	SITE VICINITY MAP	APPROVED BY SAN 3/5/99 / DATE
COST/SCHEDULE-AREA		NSWC - WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1-1 / REV 0

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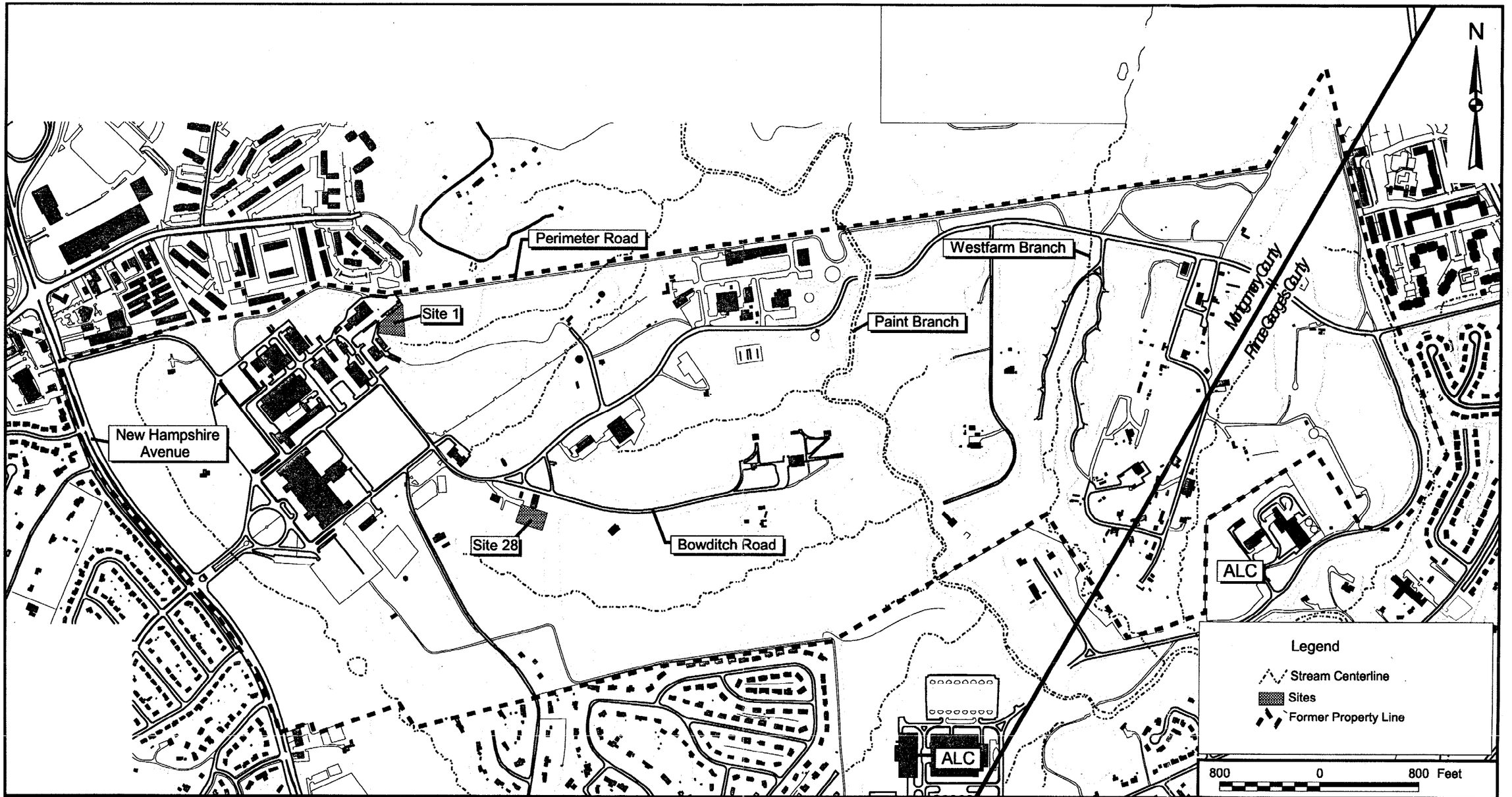

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

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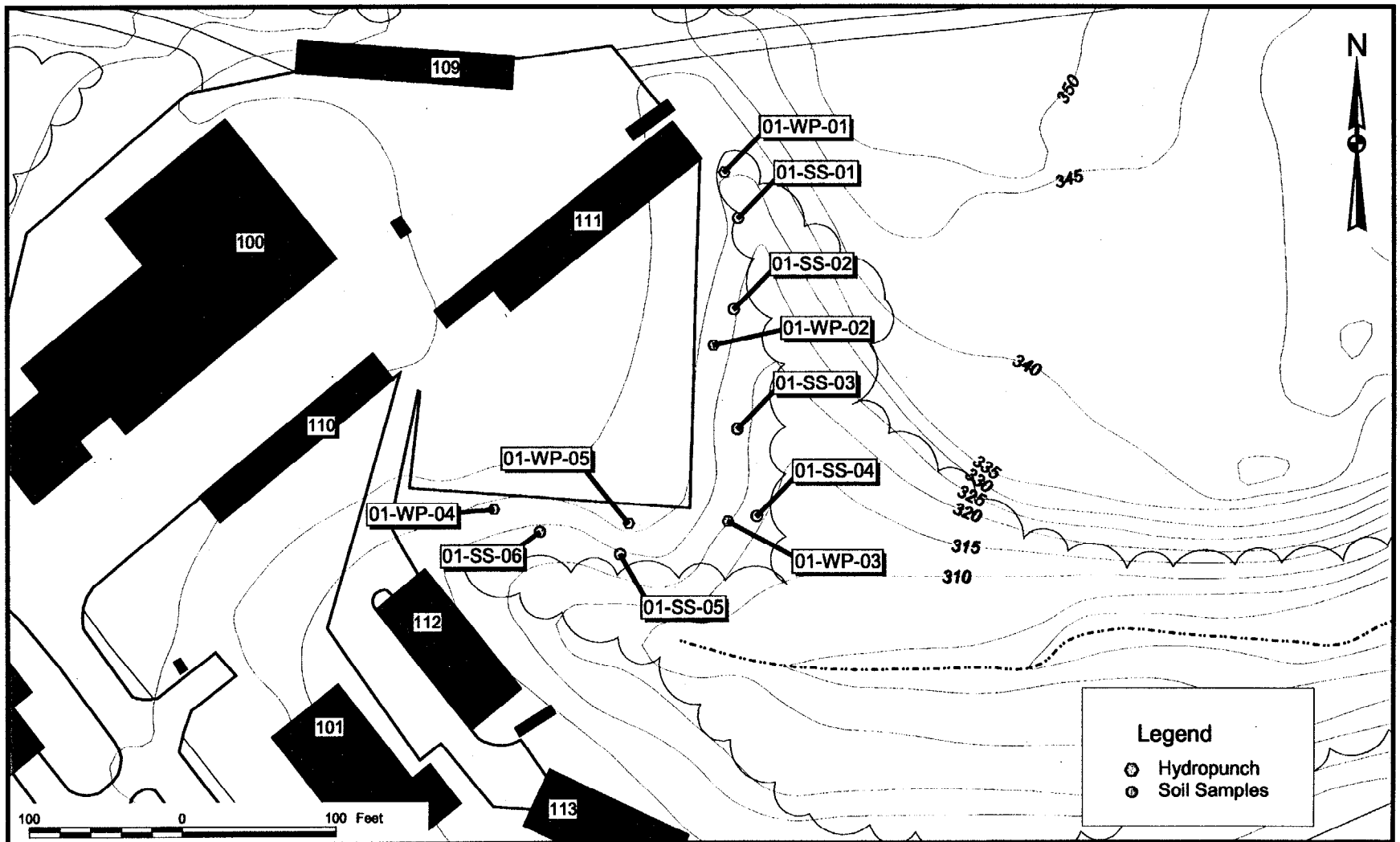

DRAWN BY MJJ — DATE 23SEPT98	Tetra Tech NUS, Inc.	CONTRACT NUMBER 7909	OWNER NUMBER 0101
CHECKED BY — DATE	SITE MAP SITE 1 / SWMU 3 - PARKING LOT LANDFILL NSWC - WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY — DATE	
COST/SCHEDULE-AREA		APPROVED BY — DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 1-3	REV 0

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The wastes supposedly disposed within this landfill include lubricating oil, battery acid, metal plating wastes, and metal scrap. It has been reported that approximately 60 automobile batteries were disposed at the site over its operating life. Although the site is now used as a parking lot and is paved with asphalt, visible wastes including tires, glass, and old metal equipment have been observed on the southern and eastern slopes beyond the edge of the parking lot. Photographs of the paved portion of Site 1 are provided in Appendix A.

The Parking Lot Landfill is a slightly sloping paved area. Runoff from the paved area is directed toward the southwestern corner. The eastern and southern faces of the landfill, outside the boundaries of the paved area, are both steeply sloped into drainage swales.

Is this the decon pad?

Surface water from a small portion of the paved landfill is collected in a bermed area located in the southwestern corner. The bermed area has been constructed with a tap water spigot and a drain that directs the runoff to a secondary containment vault.

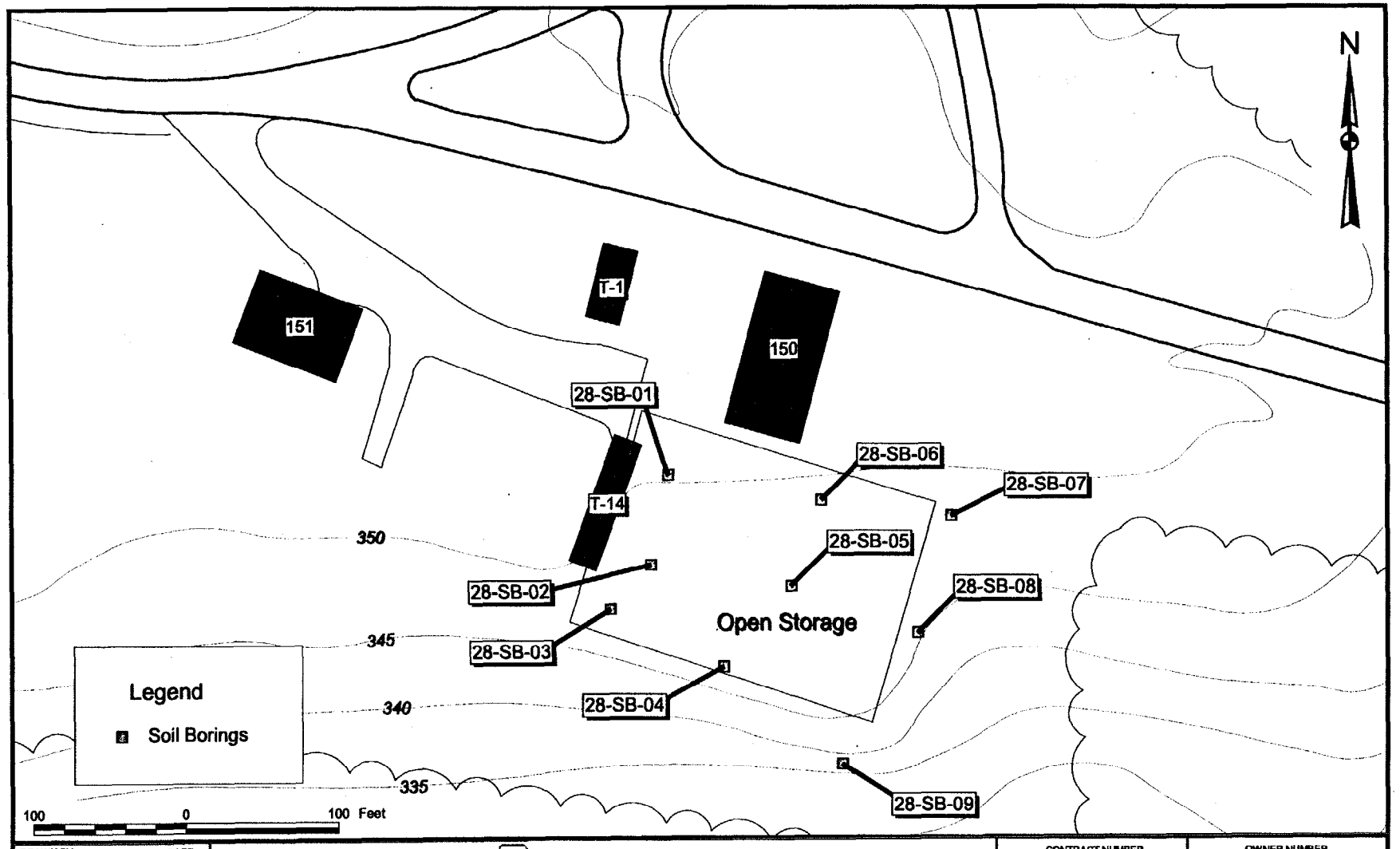
An intermittent stream flows southward in the drainage swale located parallel to the eastern edge of the landfill. A stream fed by NPDES Outfall No. 009 flows eastward along the southern edge of the landfill. The two swales join near the southeastern corner of the landfill. The combined flow is directed eastward to Paint Branch, along the toe of IRP Site 2, Apple Orchard Landfill.

As evidenced by observations made during previous field investigations, the Parking Lot Landfill consists mostly of fill comprised of sandy clay with a silty component and some gravel. Solid wastes, including wood, metal scraps, used equipment, tires, glass, and automotive batteries, are buried within the landfill.

Five temporary well points were installed along the eastern and southern edges of the Parking Lot Landfill during 1997. The static water levels measured within these five temporary well points lie between 14 feet and 17 feet below ground surface (bgs). Differences among the static water levels in the five temporary wells, and the locations of streams along the southern and eastern edges of the site, suggest that groundwater flows through the landfill material in a southeastward direction.

1.1.2 Site 28 - Building T-14 Scrapyard

The Building T-14 Scrapyard is a fenced area used to temporarily store materials prior to disposal or reuse (Figure 1-4). The site was identified as an IRP Site by the Navy and as a SWMU by EPA during the RFA in 1990 (Kearney/Centaur, 1990). The site, which measures 150 feet by 300 feet, was used



DRAWN BY MJJ DATE 23SEPT98	Tetra Tech NUS, Inc.	CONTRACT NUMBER 7909	OWNER NUMBER 0101
CHECKED BY DATE	SITE MAP SITE 28 / SWMU 88 - BUILDING T-14 SCRAPYARD NSWC - WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY SAN DATE 3/5/99	
COST/SCHEDULE-AREA		APPROVED BY DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 1-4	REV 0

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between 1967 and 1975 to store transformers directly on the hard-packed gravel surface. The specific location of this former transformer staging area within Site 28 is not known. Some areas of the site are currently covered with concrete.

Site 28 is generally flat, with no distinct topographical features. It gently slopes southward at the southeastern corner. The maximum relief of the site is approximately 5 feet, with a maximum elevation of 350 feet and a low elevation of 345 feet.

There are no surface water bodies at Site 28. All of NSWC White Oak is drained by Paint Branch and its tributaries. The nearest surface water body is a small southward-flowing tributary of Paint Branch, located approximately 500 feet to the south of the site. The stream flows toward the southeast and empties into Paint Branch.

Boring logs for drilling activity at Site 28 indicated a gravel layer (inside the fenced yard) to a depth of approximately 2 feet. Underlying the gravel layer inside the fenced area and in the area surrounding the fenced scrapyard, the soil is a mixture of clay, silt, and sand. Although none of the Site 28 borings extended beyond 4 feet deep, it is expected that Site 28 subsurface conditions include the same coastal plain deposits overlying a saprolite bedrock layer as observed in deeper borings at neighboring sites.

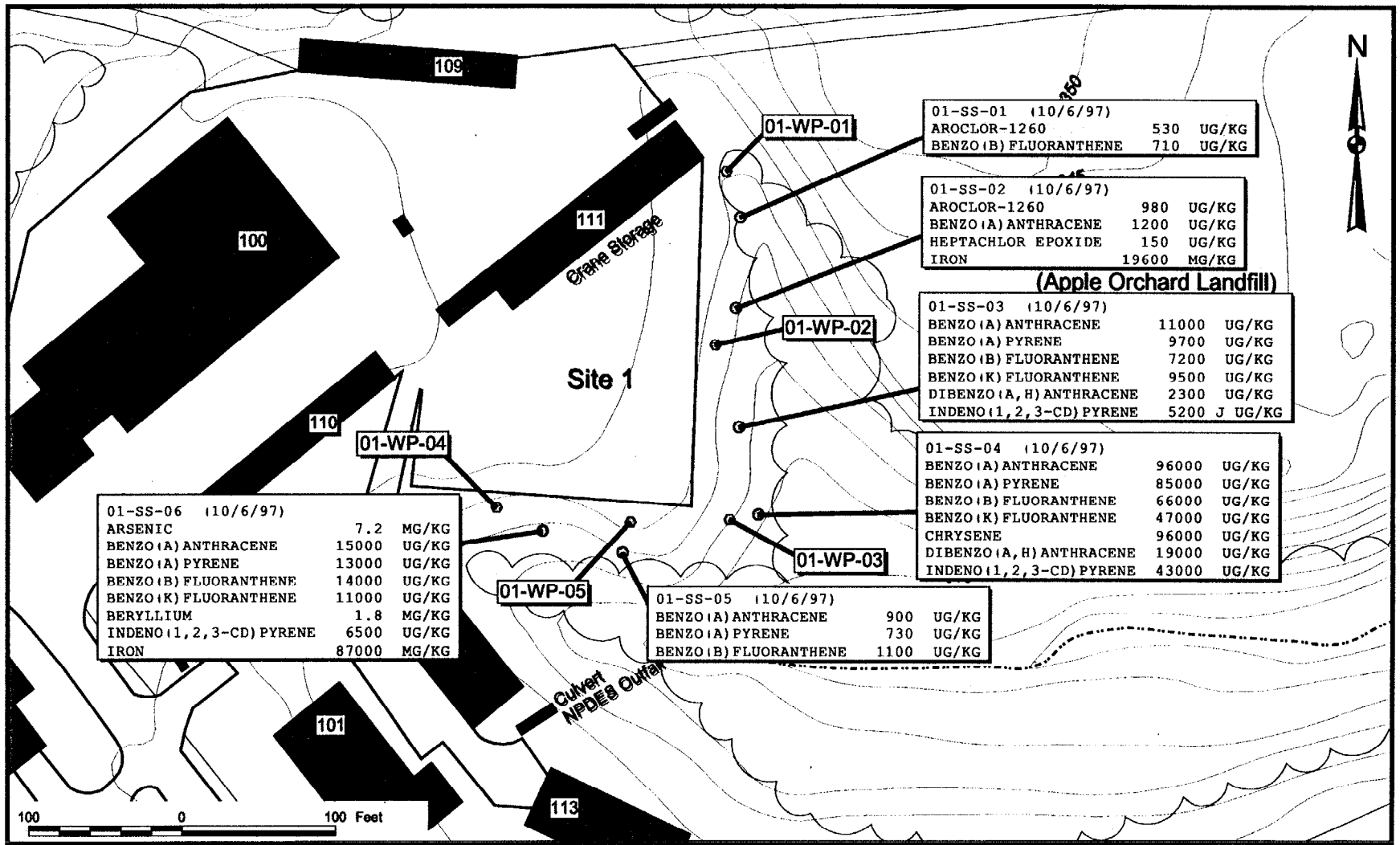
Photographs of Site 28 are provided in Appendix A. As can be seen in the photographs, use of the scrapyard during the closure of NSWC-White Oak resulted in the deposition of various debris and litter. The proposed EE/CA for the site will address the removal of this accumulated debris as a general housekeeping measure.

1.2 NATURE AND EXTENT OF CONTAMINATION

The following sections summarize the nature and extent of contamination at Sites 1 and 28, based on data collected during previous field investigation activities.

1.2.1 Site 1 - Parking Lot Landfill

Previous soil sampling locations are shown on Figure 1-5. The contaminants identified in the figure were detected at concentrations in excess of EPA Region III residential risk-based concentrations (RBCs) and base-specific background values for inorganic contaminants (B&R Environmental, 1998b).



DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NUMBER
MJJ	23SEPT98		7909	0101
CHECKED BY	DATE	ANALYTICAL DATA - SURFACE SOIL SITE 1 / SWMU 3 - PARKING LOT LANDFILL NSWC - WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY SAW	DATE 3/5/99
COST/SCHEDULE-AREA			APPROVED BY	DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1-5	REV 0

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The primary contaminants identified in surface soil (0-6 inches) at the site were semivolatile organics (SVOCs). In particular, polyaromatic hydrocarbons (PAHs) including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and chrysene were detected in surface soil samples collected on the southern and eastern slopes of the landfill.

In addition to the surface soil sampling, groundwater samples were collected from temporary wells placed along the southern and eastern perimeters of the landfill. Low levels of volatile organic compounds (VOCs) were detected in well point WP-04, in the southwestern corner of the landfill. Previous groundwater data is provided in Figure 1-6.

Soil and groundwater analytical data collected at Site 1 are provided in Appendix B.

1.2.2 Site 28 - Building T-14 Scrapyard

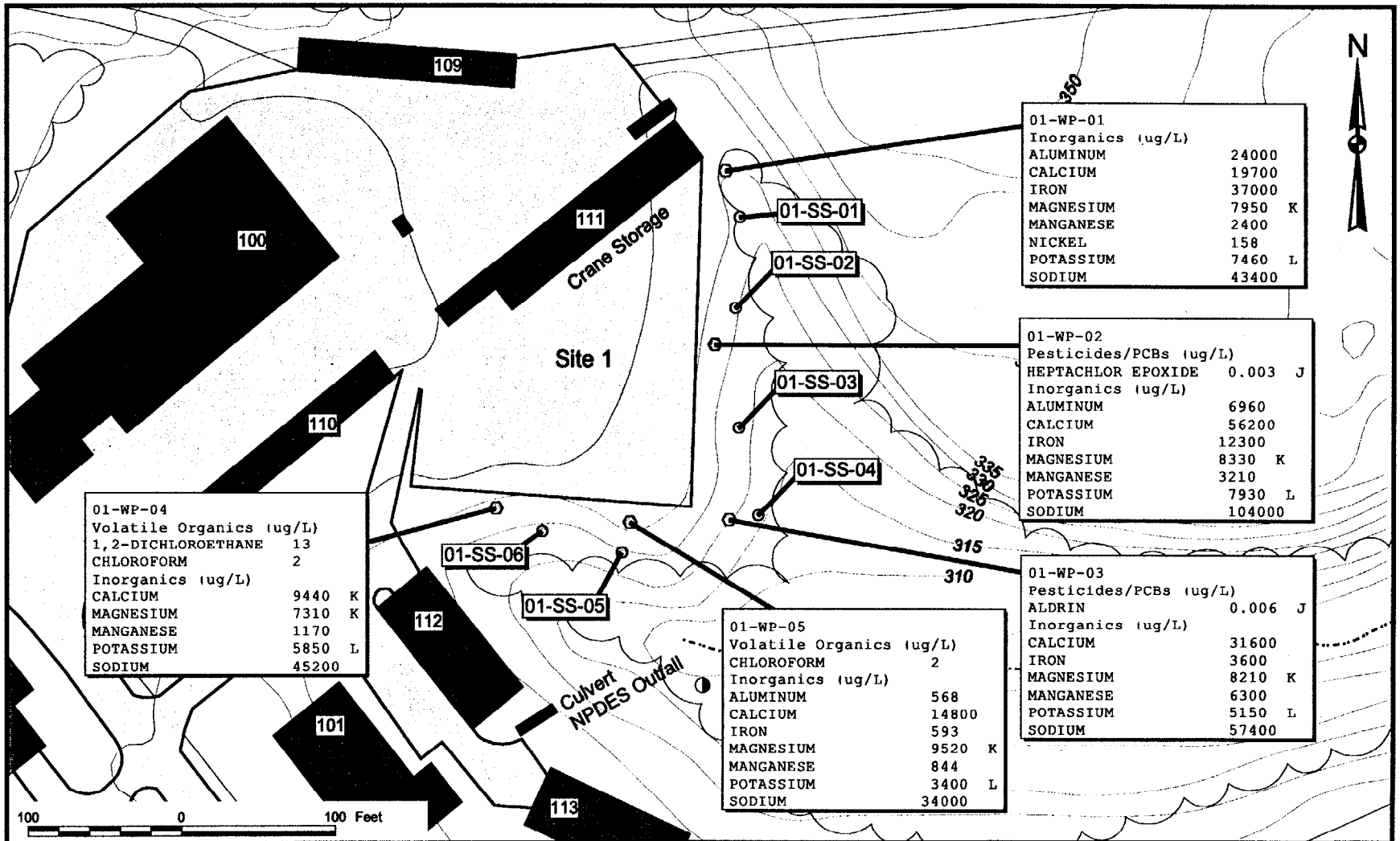
TtNUS collected surface and subsurface soil samples from nine locations within and around the site during field activities in October 1997. Surface soil sample locations and analytical results are shown on Figure 1-7. Subsurface soil sample locations and analytical results are identified on Figure 1-8.

Because the exact location of the former transformer staging area has not been identified, nine soil sample locations were selected to aid in determining the nature and extent of any surface or subsurface soil contamination that may have resulted from these staging operations.

In general, elevated PAH concentrations were detected northeast of the scrapyard. Aroclor 1260 was also detected in a drainage swale in the southeastern corner of the site. Arsenic was detected in three samples in the northwestern corner at concentrations in excess of residential RBCs and base-specific background surface soil concentrations.

Little subsurface soil contamination was detected at Site 28. Low and/or estimated concentrations of PCBs (Aroclor 1260) were detected at all subsurface (between 2 and 4 feet) soil sampling locations; however, the residential RBC was only exceeded at two locations. Benzo(a)pyrene and iron were the only other analytes detected at concentrations exceeding the residential RBCs and background values.

Soil analytical data collected at Site 28 are provided in Appendix C.



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CHECKED BY — DATE	ANALYTICAL DATA - UNFILTERED GROUNDWATER SITE 1 / SWMU 3 - PARKING LOT LANDFILL NSWC - WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY SAN — DATE 3/5/99	
COST/SCHEDULE-AREA		APPROVED BY — DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 1-6	REV 0

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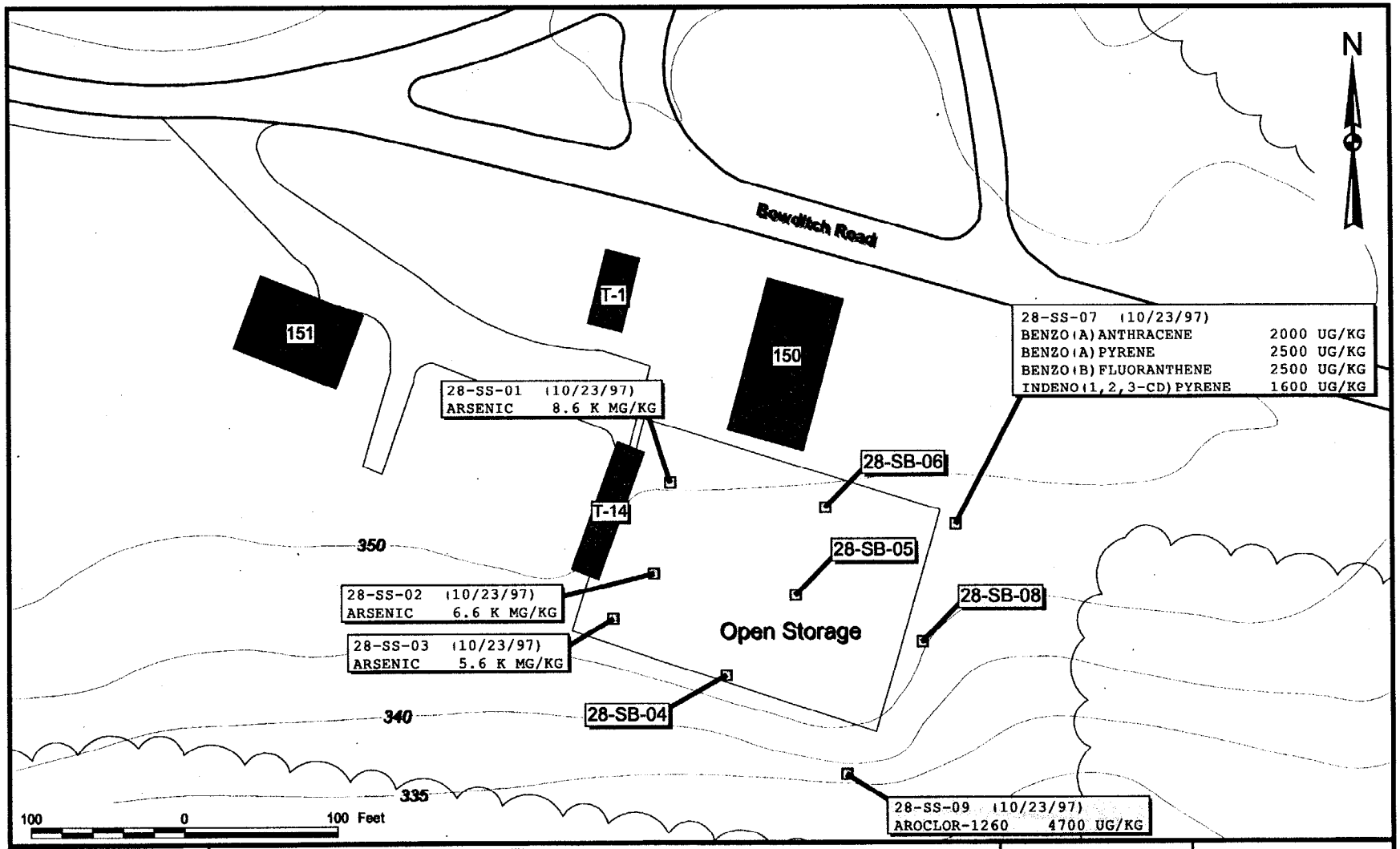

DRAWN BY MJJ DATE 23SEPT98	Tetra Tech NUS, Inc.	CONTRACT NUMBER 7909	OWNER NUMBER 0101
CHECKED BY DATE	ANALYTICAL DATA - SURFACE SOIL SITE 28 / SWMU 88 - BUILDING T-14 SCRAPYARD NSWC - WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY SAN DATE 3/5/99	
COST/SCHEDULE-AREA		APPROVED BY DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 1-7	REV 0

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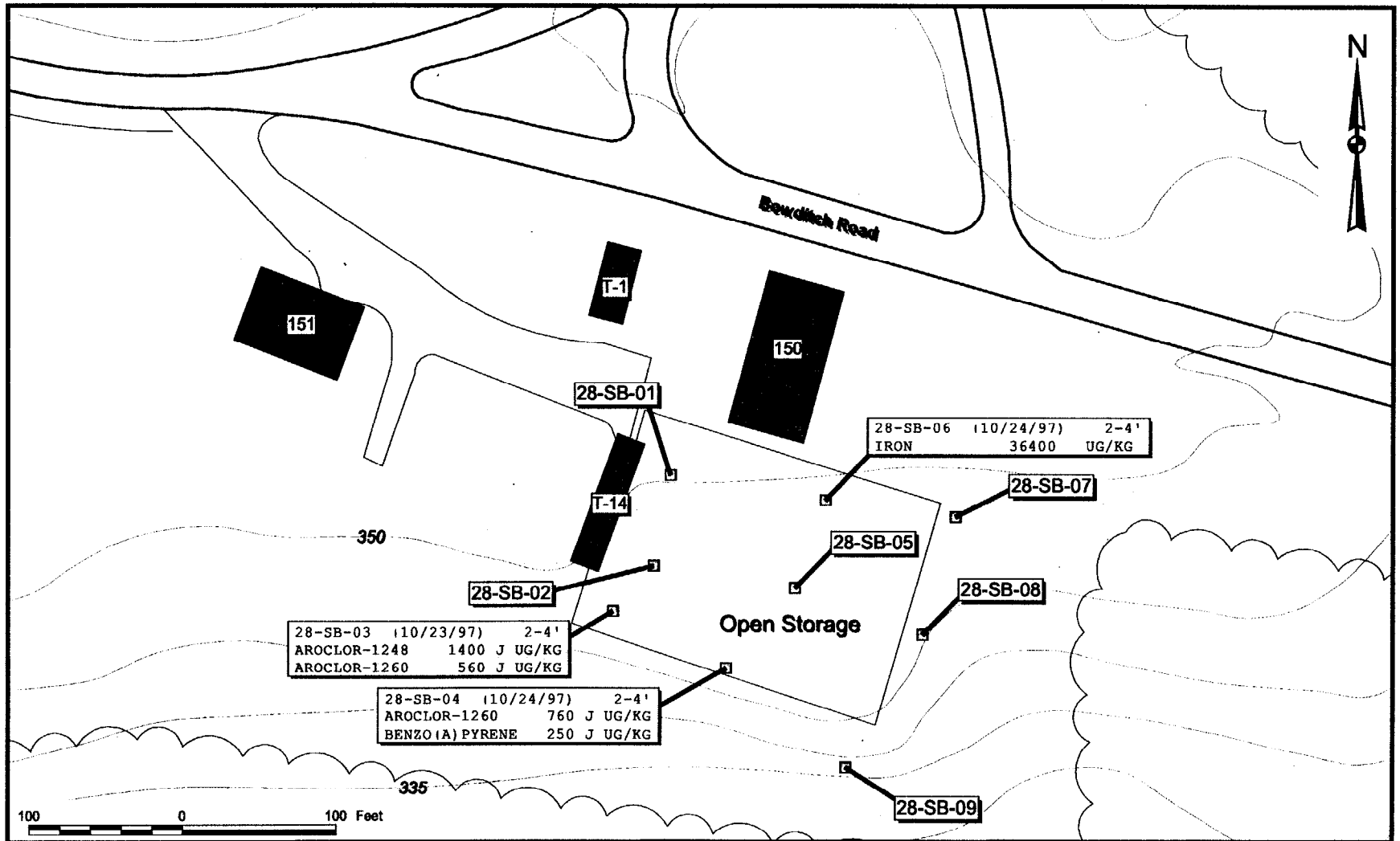

DRAWN BY MJJ — DATE 23SEPT98	Tetra Tech NUS, Inc.	CONTRACT NUMBER 7909	OWNER NUMBER 0101
CHECKED BY — DATE	ANALYTICAL DATA - SUBSURFACE SOIL SITE 28 / SWMU 88 - BUILDING T-14 SCRAPYARD NSWC - WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY SAN — DATE 7/5/99	
COST/SCHEDULE-AREA		APPROVED BY — DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 1-8	REV 0

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1.3 REPORT ORGANIZATION

Section 1.0 provides a brief introduction, including the history and physical properties of Sites 1 and 28, the nature and extent of contamination, and the objectives of the field work. Section 2.0 outlines the scope of work for each site. Section 3.0 details procedures and methods to be used in performing the field work proposed in the scope of work. TtNUS field forms and standard operating procedures (SOPs) are provided in appendices to the Master FSP for NSWC-White Oak (B&R Environmental, 1998a).

2.0 SCOPE OF WORK

The scope of work identified in this FSP discusses the work to be conducted at Site 1 and Site 28. Separate EE/CAs will be performed for each site to best determine appropriate non-time-critical removal actions. This investigation is required to obtain information to supplement existing data in order to facilitate an accurate, complete evaluation.

2.1 SITE 1 - PARKING LOT LANDFILL

Additional information is required to determine the lateral and vertical extent of contamination, identify the types and concentrations of contamination in the subsurface, and determine subsurface soil conditions to evaluate viable alternatives for a non-time-critical removal action. The following is a summary of the field efforts necessary to obtain this information.

- Excavate 10 test pits to delineate the landfill disposal boundaries.
- Collect 10 subsurface soil samples from within the proposed test pits to further delineate the lateral and vertical extents of subsurface soil contamination.
- Collect ~~10~~ 11 surface soil samples to delineate the limits of residual contamination beyond the limits of waste placement.
- Collect five subsurface waste samples to characterize materials for disposal.

The proposed sampling rationale for Site 1 is provided in Table 2-1. Table 2-2 summarizes the quality assurance (QA)/quality control (QC) samples that will be collected. The proposed locations of test pits and soil samples are illustrated on Figure 2-1.

Based on existing data, test pits will be excavated to a maximum depth of 16 feet bgs. The locations of test pits and samples identified on Figure 2-1 were determined based on data currently available about the subsurface conditions at Site 1. Conditions in the field may necessitate minor field adjustments in sample locations and/or test pit boundaries. Samples may be reallocated to areas that appear to be more heavily contaminated from areas with little or no apparent contamination. Field modifications to activities outlined in this FSP will be made in accordance with procedures outlined in Section 13.1 of the Master QAPP, Field Corrective Action.

TABLE 2-1

PROPOSED SAMPLING RATIONALE
SITE 1 - PARKING LOT LANDFILL
SITE 28 - BUILDING T-14 SCRAPYARD
FORMER NSWC WHITE OAK, SILVER SPRING, MARYLAND

Sample Location	Sample Medium/ Quantity	Analytical Parameters	Rationale
SITE 1 PARKING LOT LANDFILL			
Test Pit 01 through 10	10 Subsurface Soil Samples	TAL Metals TCL VOCs TCL SVOCs TCL Pesticide/PCBs Explosives	To determine the presence of residual soil contamination
Test Pits – Various (locations to be determined in the field)	5 Subsurface waste samples	TCLP - Metals, VOCs, SVOCs, Pesticide/PCBs	To characterize the waste materials and the options for waste disposal
Surface Soil (locations on landfill perimeter)	11 Surface Soil	TAL Metals TCL VOCs TCL SVOCs TCL Pesticide/PCBs Explosives	To determine the nature and extent of soil contamination along the landfill perimeter
SITE 28 – BUILDING T-14 SCRAPYARD			
Vicinity of 28-SB-03	7 Surface Soil	TCL PCBs	To characterize/ delineate PCB contamination
	7 Near Surface Soil (2 to 4 foot depth)	TCL PCBs	To characterize/ delineate PCB contamination
Vicinity of 28-SB-09	7 Surface Soil	TCL PCBs	To characterize/ delineate PCB contamination
	7 Near Surface Soil (2 to 4 foot depth)	TCL PCBs	To characterize/ delineate PCB contamination
Vicinity of 28-SB-04	2 Surface Soil	TCL SVOCs	To characterize/ delineate SVOC contamination
Vicinity of 28-SB-07	3 Surface Soil	TCL SVOCs	To characterize/ delineate SVOC contamination

TABLE 2-2

SUMMARY OF QA/QC SAMPLES AND ANALYSIS
SITE 1 - PARKING LOT LANDFILL
SITE 28 - BUILDING T-14 SCRAPYARD
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Analysis	Method	Environmental Samples	Field Duplicates	Trip Blanks(1)	Rinsate Blanks(2)	Field Blanks(3)	MS/MSD	Total
Soil								
TAL Total Metals	CLP SOW ILM04.0	21	2	NA (4)	TBD	TBD	1	24
TCL VOCs	CLP SOW OLM03.2	21	2	TBD	TBD	TBD	1	24
TCL SVOCs	CLP SOW OLM03.2	26	3	NA	TBD	TBD	1	30
TCL Pesticide/PCBs	CLP SOW OLM03.2	49	5	NA	TBD	TBD	2	56
Explosives	SW846 8330	21	2	NA	TBD	TBD	1	24
TCLP	SW 1311	5	1	NA	TBD	TBD	NA	4

1 Trip blanks will be generated at a frequency of one per cooler containing samples for volatile organic analysis.
2 Rinsate blanks will be generated at a minimum rate of one per day of sampling (per matrix). If pre-cleaned, dedicated, or disposable equipment is used, one rinsate blank per type of equipment used will be collected.
3 Field blanks will be generated at a rate of one per decontamination water source.
4 NA - Not applicable

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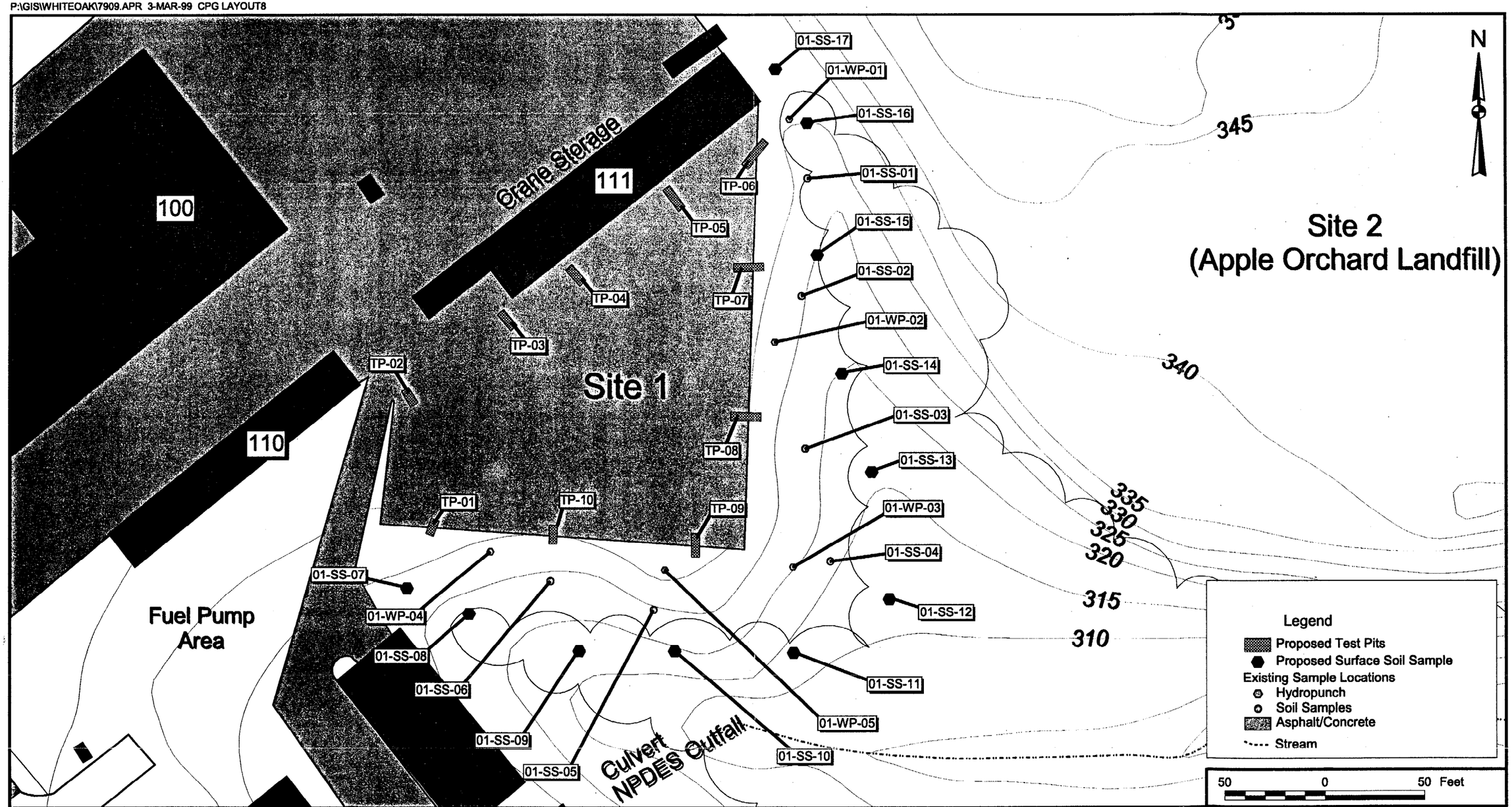


NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY MJJ	DATE 23SEPT98
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	

Tetra Tech NUS, Inc.

PROPOSED SAMPLING PLAN
SITE 1 / SWMU 3 - PARKING LOT LANDFILL
NSWC - WHITE OAK
SILVER SPRING, MARYLAND

CONTRACT NUMBER 7909	OWNER NUMBER 0101
APPROVED BY SAN	DATE 7/15/99
APPROVED BY	DATE
DRAWING NO. FIGURE 2-1	REV 0

00064B032

Sample locations associated with test pits will be collected from the base of the excavation within natural soils, beneath the landfill materials. The samples will be collected from the bucket of the excavator, because no personnel will be permitted to enter any test pits.

Surface soil samples (0-6 inches) collected along the landfill perimeter will be collected using hand trowels. Visual observation will be used in selecting the sampling locations. Areas where contamination is identified visually will be selected for sampling.

Waste material samples collected from the test pits will be collected half-way between the bottom of the excavation and the ground surface or wherever the heaviest contamination is observed. Visual observations or field screening using a photoionization detector (PID)/flame ionization detector (FID) will be used to select the waste material samples.

Analytical results will be available based on a 21-day turnaround time.

2.2 SITE 28 - BUILDING T-14 SCRAPYARD

The proposed sampling rationale for Site 28 is provided in Table 2-1. Table 2-2 summarizes the QA/QC samples that will be collected. Sampling locations are identified on Figure 2-2.

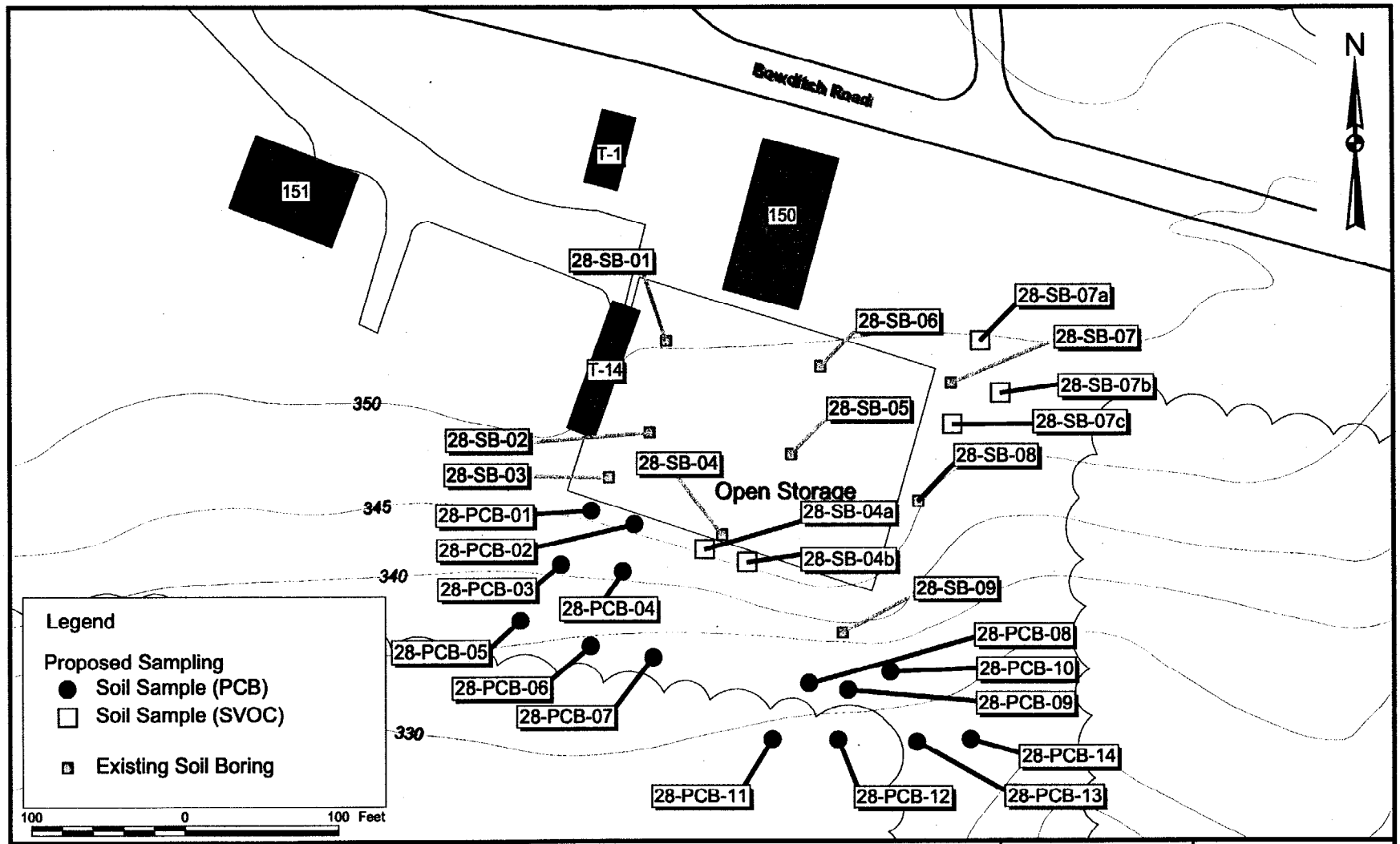
Soil sampling will be conducted downslope from areas where contamination was found during previous investigations. Surface and subsurface soil samples will be collected downslope of locations 28-SB-04 and 28-SB-07 and analyzed for SVOCs to further characterize PAH contamination identified previously at these locations.

Surface soil sampling will be conducted downslope of locations 28-SB-03 and 28-SB-09 and analyzed for polychlorinated biphenyls (PCBs). Samples will be collected with hand tools and analyzed for TCL PCBs.

Analytical results will be available based on a 21-day turnaround time.

2.3 PROJECT SCHEDULE

Figure 2-3 provides the schedule for the field activities and the development of the EE/CAs.



DRAWN BY MJJ — DATE 23SEPT98	Tetra Tech NUS, Inc.	CONTRACT NUMBER 7909	OWNER NUMBER 0101
CHECKED BY — DATE	PROPOSED SAMPLING PLAN SITE 28 / SWMU 88 - BUILDING T-14 SCRAPYARD NSWC - WHITE OAK SILVER SPRING, MARYLAND	APPROVED BY SAN — DATE 3/5/99	
COST/SCHEDULE-AREA		APPROVED BY — DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 2-2	REV 0

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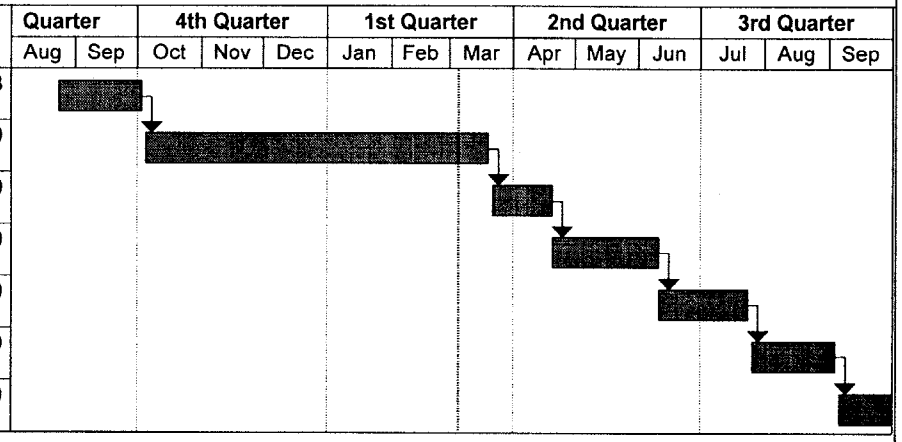
FIGURE 2-3
SITE 1 AND 28 SCHEDULE

ID	Task Name	Duration	Start	Finish
1	Draft Work Plan	30 days	8/24/1998	10/2/1998
2	Final Work Plan	120 days	10/5/1998	3/19/1999
3	Field Work	21 days	3/22/1999	4/19/1999
4	Data Analysis/Validation	38 days	4/20/1999	6/10/1999
5	Draft EE/CA Report	31 days	6/11/1999	7/23/1999
6	BCT Review	30 days	7/26/1999	9/3/1999
7	Final EE/CA Report	19 days	9/6/1999	9/30/1999



Project:
Date: 3/5/1999

Task		Rolled Up Task		Project Summary	
Progress		Rolled Up Milestone	◇	Split	
Milestone	◆	Rolled Up Progress		Rolled Up Split	
Summary		External Tasks			

3.0 FIELD ACTIVITIES AND PROCEDURES

The field investigation will include the following activities:

- Mobilization/demobilization
- Test pit excavation
- Soil sampling
- Sample handling
- Sample custody
- Decontamination
- Equipment calibration
- Investigation-derived waste (IDW) disposal
- Field survey

Field forms to be used throughout the project are provided in Appendix A of the Master FSP for NSWC-White Oak.

3.1 MOBILIZATION/DEMOBILIZATION

In general, mobilization/demobilization activities will follow the guidelines discussed in Section 2.1 of the Master FSP for NSWC-White Oak. TtNUS will prepare specifications and obtain subcontractors for test pit excavation, laboratory analyses, surveying, and IDW disposal. All field team members will review the project FSP and HASP and the Master FSP prior to mobilizing to the site. A field team orientation meeting will be held to familiarize personnel with the scope of the field activities.

TtNUS will verify the presence or absence of underground utilities in the vicinity of Sites 1 and 28 by reviewing NSWC-White Oak utility maps. Underground utilities that are identified through this review will be marked in the field and checked with an underground cable locator before intrusive activities are initiated.

All site restoration activities will be performed by TtNUS's subcontractors. Site restoration may include, but will not be limited to, pavement replacement and/or regrading and reseeding areas where test pits were excavated and general IDW cleanup.

3.2 TEST PITS

Test pits will be excavated during the field work. Soil grab samples will be collected from each test pit based on visual observations or screening with the PID/FID to determine the most contaminated soil. Samples will be collected directly from the backhoe bucket. Under no circumstances will field personnel be permitted to enter a test pit. Test pits will be backfilled with the excavated material before each day's work activities are completed. The field geologist will complete a test pit log for each test pit. Test pit excavation and sampling will be performed in accordance with Section 2.2.2 of the Master FSP and TtNUS SOP SA-1.3.

3.3 SOIL SAMPLING

Soil samples will be collected from the bucket of the backhoe during test pit sampling, and surface and near-surface soil samples will be collected with hand tools during sampling activities at other sampling locations. All samples will be monitored with an organic vapor monitor and then collected for chemical analysis. Upon sample retrieval, the samples to be analyzed for volatile constituents will be containerized first and immediately sealed. All pertinent field data will be recorded using a soil and sediment sample log sheet.

Tables 3-1 and 3-2 provide summaries of the proposed sampling at Sites 1 and 28, including sample identification numbers, method of collection, and analytical parameters. Field duplicate samples are also identified.

3.4 SAMPLE HANDLING

Sample handling procedures and practices will be conducted as outlined in Section 3.2 of the Master FSP (B&R Environmental, 1998a). Table 3-3 summarizes analytical parameters and methods and requirements for bottleware, sample preservation, and allowable holding times.

The sample identification numbers specified in Tables 3-1 and 3-2 are read as follows: The first two characters indicate the site from which the samples will be collected (01 for Site 1; 28 for Site 28). For Site 01 the next two characters indicate the sample medium (TP - test pit, LF - landfill, SS - surface soil). For Site 28, the next 2/3 characters represent either the sample media (SB) or sample parameters (PCBs).

For non-test pit samples, the final two characters denote the sample number. Sample depth indicators will not be added to these identification numbers.

TABLE 3-1

SUMMARY OF PROPOSED SAMPLING
SITE 1 - PARKING LOT LANDFILL
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND
PAGE 1 OF 2

Sample Identification Number	Method of Collection	Sample Collection Depth	Analysis						Comments
			TAL Metals	TCL VOCs	TCL SVOCs	TCL P/P	Explosives	Other	
01-TP-01	Test Pit	TBD	X	X	X	X	X		
01-TP-02	Test Pit	TBD	X	X	X	X	X		
01-TP-03	Test Pit	TBD	X	X	X	X	X		
01-TP-03D	Test Pit	TBD	X	X	X	X	X		Duplicate; actual location to be determined
01-TP-04	Test Pit	TBD	X	X	X	X	X		
01-TP-05	Test Pit	TBD	X	X	X	X	X		
01-TP-06	Test Pit	TBD	X	X	X	X	X		
01-TP-07	Test Pit	TBD	X	X	X	X	X		
01-TP-08	Test Pit	TBD	X	X	X	X	X		
01-TP-09	Test Pit	TBD	X	X	X	X	X		
01-TP-10	Test Pit	TBD	X	X	X	X	X		
01-LF-01	Test Pit	NA						X (1)	Grab sample of waste collected from test pit to be determined.
01-LF-02	Test Pit	NA						X (1)	Grab sample of waste collected from test pit to be determined.
01-LF-03	Test Pit	NA						X (1)	Grab sample of waste collected from test pit to be determined.
01-LF-04	Test Pit	NA						X (1)	Grab sample of waste collected from test pit to be determined.

TABLE 3-1

SUMMARY OF PROPOSED SAMPLING
SITE 1 - PARKING LOT LANDFILL
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND
PAGE 2 OF 2

Sample Identification Number	Method of Collection	Sample Collection Depth	Analysis						Comments
			TAL Metals	TCL VOCs	TCL SVOCs	TCL P/P	Explosives	Other	
01-LF-05	Test Pit	NA						X (1)	Grab sample of waste collected from test pit to be determined.
01-SS-07	Grab	Surface	X	X	X	X	X		
01-SS-08	Grab	Surface	X	X	X	X	X		
01-SS-09	Grab	Surface	X	X	X	X	X		
01-SS-10	Grab	Surface	X	X	X	X	X		
01-SS-10D	Grab	Surface	X	X	X	X	X		Duplicate; actual location to be determined
01-SS-11	Grab	Surface	X	X	X	X	X		
01-SS-12	Grab	Surface	X	X	X	X	X		
01-SS-13	Grab	Surface	X	X	X	X	X		
01-SS-14	Grab	Surface	X	X	X	X	X		
01-SS-15	Grab	Surface	X	X	X	X	X		
01-SS-16	Grab	Surface	X	X	X	X	X		
01-SS-17	Grab	Surface	X	X	X	X	X		

1 Sample to be analyzed for full TCLP regulatory list as presented in Table 3-2 of the Master Work Plan.

TBD - Sample depth to be determined at time of sample collection and is dependent upon test pit depth and visual observations of contamination. The 4-digit sample depth portion of the sample identification number will be added in the field.

D - Indicates sample is a field duplicate of the preceding sample.

NA - Not Applicable, sample of waste to be collected from test pits at varying depths.

TABLE 3-2

SUMMARY OF PROPOSED SAMPLING
SITE 28 - BUILDING T-14 SCRAPYARD
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Sample Identification	Method of Collection	Sample Collection Depth	Analysis		Comments
			TCL PCBs	TCL SVOCs	
SOIL					
28-PCB-01	Grab	0-6"	X		
28-PCB-01-0204	Grab	2-4'	X		
28-PCB-02	Grab	0-6"	X		
28-PCB-02-0204	Grab	2-4'	X		
28-PCB-03	Grab	0-6"	X		
28-PCB-03D	Grab	0-6"	X		Duplicate sample
28-PCB-03-0204	Grab	2-4'	X		
28-PCB-04	Grab	0-6"	X		
28-PCB-04-0204	Grab	2-4'	X		
28-PCB-05	Grab	0-6"	X		
28-PCB-05-0204	Grab	2-4'	X		
28-PCB-06	Grab	0-6"	X		
28-PCB-06-0204	Grab	2-4'	X		
28-PCB-07	Grab	0-6"	X		
28-PCB-07-0204	Grab	2-4'	X		
28-PCB-07D	Grab	0-6"	X		Duplicate sample
28-PCB-08	Grab	0-6"	X		
28-PCB-08-0204	Grab	2-4'	X		
28-PCB-09	Grab	0-6"	X		
28-PCB-09-0204	Grab	2-4'	X		
28-PCB-10	Grab	0-6"	X		
28-PCB-10-0204	Grab	2-4'	X		
28-PCB-10-0204D	Grab	2-4'	X		Dupliate sample
28-PCB-11	Grab	0-6"	X		
28-PCB-11-0204	Grab	2-4'	X		
28-PCB-12	Grab	0-6"	X		
28-PCB-12-0204	Grab	2-4'	X		
28-PCB-13	Grab	0-6"	X		
28-PCB-13-0204	Grab	2-4'	X		
28-PCB-14	Grab	0-6"	X		
28-PCB-14-0204	Grab	2-4'	X		
28-SB-04a	Grab	0-6"		X	
28-SB-04b	Grab	0-6"		X	
28-SB-07a	Grab	0-6"		X	
28-SB-07b	Grab	0-6"		X	
28-SB-07bD	Grab	0-6"		X	Duplicate sample
28-SB-07c	Grab	0-6"		X	

D - Sample is field duplicate of preceeding sample.

TABLE 3-3

REQUIREMENTS FOR SAMPLE BOTTLEWARE, PRESERVATION, AND HOLDING TIME
SITE 1 - PARKING LOT LANDFILL
SITE 28 - BUILDING T-14 SCRAPYARD
FORMER NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Analysis	Method	Sample Volume	Container Material	Preservation	Holding Time [1]
SOIL					
TAL Metals	CLP SOW ILM04.0	240 mL (8 oz.)	Wide-mouth glass jar; Teflon-lined lid	Cool to 4°C	6 months Mercury - 28 days
TCL VOCs	CLP SOW OLM03.2	120 mL (4 oz.)	Wide-mouth glass jar; Teflon-lined lid	Cool to 4°C	14 days
TCL SVOCs	CLP SOW OLM03.2	240 mL (8 oz.)	Wide-mouth glass jar; Teflon-lined lid	Cool to 4°C	Extract 7 days Analyze 40 days
TCL Pesticide/PCBs	CLP SOW OLM03.2	120 mL (4 oz.)	Wide-mouth glass jar; Teflon-lined lid	Cool to 4°C	14 days
Explosives	SW8330	240 mL (8 oz.)	Amber wide-mouth glass jar; Telfon-lined lid	Cool to 4°C	Extract 7 days Analyze 40 days
TCLP	SW 1311	32 oz.	Wide-mouth glass jar; Teflon-lined lid	Cool to 4°C	(2)

1 Holding times are measured from the time of collection.
2 TCLP holding times:
Volatiles: 14 days to TCLP extraction, 14 days from extraction to analysis.
Semivolatiles: 14 days to TCLP extraction, 7 days from extraction to preparative extraction, 40 days from preparative extraction to analysis.
Metals: 180 days to TCLP extraction; 180 days from extraction to analysis.
Note: VOC samples shall be collected such that there is 0 to minimal head space in the sample container.

3.5 SAMPLE CUSTODY

Custody of samples must be maintained and documented at all times. Chain of custody begins with the collection of field samples. TtNUS SOP SA-6.1 and Section 5.0 of the Master QAPP for NSWC-White Oak provide further detail on sample custody procedures (B&R Environmental, 1998a).

3.6 DECONTAMINATION

The equipment involved in the field sampling activities will be decontaminated prior to and during sampling activities in accordance with TtNUS SOP SA-7.1. Section 2.10.1 of the Master FSP contains specific decontamination procedures for activities at NSWC-White Oak (B&R Environmental, 1998a). The backhoe bucket will be swept clean of all visible soil between each test pit. The backhoe will be pressure washed on arrival at the site and at the completion of text pit excavation activities, prior to being demobilized from the facility.

3.7 EQUIPMENT CALIBRATION

Field instruments will be calibrated according to the manufacturer's procedures, TtNUS SOPs, and procedures outlined in Section 2.5.1 of the Master FSP (B&R Environmental, 1998a).

3.8 IDW HANDLING

As stated in Section 2.11 of the NSWC-White Oak Master FSP, all IDW will be handled in accordance with the EPA guidance document Management of Investigation-Derived Wastes During Site Inspections (EPA, 1991), Maryland's Environment Article, 7-201(t), and the Code of Maryland Regulations (COMAR) 26.13.02.02.

The types of IDW expected to be generated during this field effort are decontamination fluids and field personnel personal protective equipment (PPE). Fluids generated during cleaning of hand-operated sampling equipment and the backhoe bucket will be containerized in 55-gallon drums for disposal. PPE and other debris will be collected in garbage bags and disposed in a trash receptacle.

3.9 FIELD SURVEY

Test pit boundaries and sample locations will be surveyed at both sites. Existing survey monuments within NSWC-White Oak will be used as reference points. The field survey will be performed in accordance with requirements set forth in the Master FSP for NSWC-White Oak (B&R Environmental, 1998a).

REFERENCES

B&R Environmental, June 1998a. Master Work Plans for Naval Surface Warfare Center White Oak, Silver Spring, Maryland. Prepared for the Engineering Field Activity Chesapeake, Naval Facilities Engineering Command. King of Prussia, Pennsylvania.

B&R Environmental, March 1998b. Draft Background Investigation Report for Naval Surface Warfare Center White Oak, Silver Spring, Maryland. Prepared for the Engineering Field Activity Chesapeake, Naval Facilities Engineering Command. King of Prussia, Pennsylvania.

B&R Environmental, March 1998c. Draft Site Screening Report. Prepared for the Engineering Field Activity Chesapeake, Naval Facilities Engineering Command. Wayne, Pennsylvania.

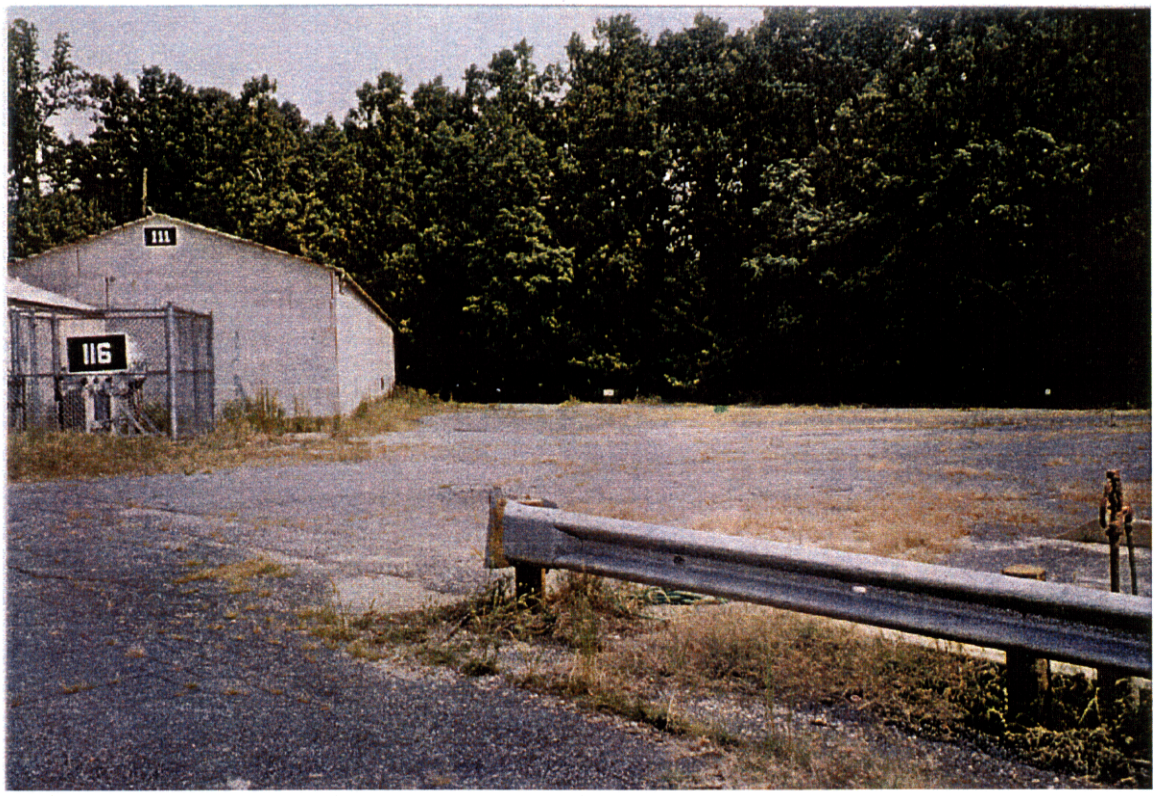
EPA (U.S. Environmental Protection Agency), 1991. Management of Investigation-Derived During Site Inspections. OERR Directive 9345.3.02.

Kearney/Centaur Division, 1990. Phase II RCRA Facility Assessment of the Naval Surface Warfare White Oak Laboratory, Silver Spring, Maryland.

APPENDIX A

SITE PHOTOGRAPHS

SITE 1 – PARKING LOT LANDFILL



Landfill – Looking Northeast (Building 111 – Crane Storage)

Landfill – Looking East

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Downslope of Sample 28-SB-09

Hillside South of Scrapyard

SITE 28 – BUILDING T-14 SCRAPYARD

Scrapyard – Looking West

Scrapyard – Looking Southeast

APPENDIX B

SITE 01
SOIL AND GROUNDWATER DATA

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER:	01-SS-01	01-SS-100	01-SS-02	01-SS-03	01-SS-04	01-SS-05
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97
LOCATION:	01-SS-01	01-SS-01	01-SS-02	01-SS-03	01-SS-04	01-SS-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:		01-SS-01				
VOLATILES (µg/kg)						
1,1,1-TRICHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 UJ	11 UJ	11 U	11 U	11 U	11 U
1,1,2-TRICHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U
1,1-DICHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U
1,1-DICHLOROETHENE	11 U	11 U	11 U	11 U	11 U	11 U
1,2-DICHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U
1,2-DICHLOROETHENE (TOTAL)	11 U	11 U	11 U	11 U	11 U	11 U
1,2-DICHLOROPROPANE	11 U	11 U	11 U	11 U	11 U	11 U
2-BUTANONE	11 U	11 U	11 U	11 U	11 U	11 U
2-HEXANONE	11 UJ	11 UJ	11 U	11 U	11 U	11 U
4-METHYL-2-PENTANONE	11 UJ	11 UJ	11 U	11 U	11 U	11 U
ACETONE	11 U	11 U	11 U	11 U	11 U	11 U
BENZENE	11 U	11 U	11 U	11 U	11 U	11 U
BROMODICHLOROMETHANE	11 U	11 U	11 U	11 U	11 U	11 U
BROMOFORM	11 U	11 U	11 U	11 U	11 U	11 U
BROMOMETHANE	11 U	11 U	11 U	11 U	11 U	11 U
CARBON DISULFIDE	11 U	11 U	11 U	11 U	11 U	11 U
CARBON TETRACHLORIDE	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROBENZENE	11 UJ	11 UJ	11 U	11 U	11 U	11 U
CHLOROETHANE	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROFORM	11 U	11 U	11 U	11 U	11 U	11 U
CHLOROMETHANE	11 U	11 U	11 U	11 U	11 U	11 U
CIS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	11 U	11 U
DIBROMOCHLOROMETHANE	11 U	11 U	11 U	11 U	11 U	11 U
ETHYLBENZENE	11 UJ	11 UJ	11 U	11 U	11 U	11 U

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER:	01-SS-01	01-SS-100	01-SS-02	01-SS-03	01-SS-04	01-SS-05
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97
LOCATION:	01-SS-01	01-SS-01	01-SS-02	01-SS-03	01-SS-04	01-SS-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:		01-SS-01				
VOLATILES (µg/kg)						
METHYLENE CHLORIDE	2 B	11 U	6 B	2 B	2 B	2 B
STYRENE	11 UJ	11 UJ	11 U	11 U	11 U	11 U
TETRACHLOROETHENE	11 UJ	11 UJ	11 U	11 U	11 U	11 U
TOLUENE	11 UJ	11 UJ	11 U	11 U	11 U	11 U
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	11 U	11 U
TRICHLOROETHENE	11 U	11 U	11 U	11 U	11 U	11 U
VINYL CHLORIDE	11 U	11 U	11 U	11 U	11 U	11 U
XYLENES, TOTAL	11 UJ	11 UJ	11 U	11 U	11 U	11 U
SEMIVOLATILES (µg/kg)						
1,2,4-TRICHLOROBENZENE	350 U	360 U	370 U	350 U	7500 U	370 U
1,2-DICHLOROBENZENE	350 U	360 U	370 U	350 U	7500 U	370 U
1,3-DICHLOROBENZENE	350 U	360 U	370 U	350 U	7500 U	370 U
1,4-DICHLOROBENZENE	350 U	360 U	370 U	350 U	7500 U	370 U
2,2'-OXYBIS(1-CHLOROPROPANE)	350 U	360 U	370 U	350 U	7500 U	370 U
2,4,5-TRICHLOROPHENOL	880 U	900 U	930 U	890 U	19000 U	930 U
2,4,6-TRICHLOROPHENOL	350 U	360 U	370 U	350 U	7500 U	370 U
2,4-DICHLOROPHENOL	350 U	360 U	370 U	350 U	7500 U	370 U
2,4-DIMETHYLPHENOL	350 U	360 U	370 U	350 U	7500 U	370 U
2,4-DINITROPHENOL	880 U	900 U	930 U	890 U	19000 U	930 U
2,4-DINITROTOLUENE	350 U	360 U	370 U	350 U	7500 U	370 U
2,6-DINITROTOLUENE	350 U	360 U	370 U	350 U	7500 U	370 U
2-CHLORONAPHTHALENE	350 U	360 U	370 U	350 U	7500 U	370 U
2-CHLOROPHENOL	350 U	360 U	370 U	350 U	7500 U	370 U
2-METHYLNAPHTHALENE	350 U	360 U	370 U	850	8000	370 U
2-METHYLPHENOL	350 U	360 U	370 U	350 U	7500 U	370 U

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER:	01-SS-01	01-SS-100	01-SS-02	01-SS-03	01-SS-04	01-SS-05
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97
LOCATION:	01-SS-01	01-SS-01	01-SS-02	01-SS-03	01-SS-04	01-SS-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:		01-SS-01				
SEMIVOLATILES (µg/kg)						
2-NITROANILINE	880 U	900 U	930 U	890 U	19000 U	930 U
2-NITROPHENOL	350 U	360 U	370 U	350 U	7500 U	370 U
3,3'-DICHLOROBENZIDINE	350 U	360 U	370 U	350 U	7500 U	370 U
3-NITROANILINE	880 U	900 U	930 U	890 U	19000 U	930 U
4,6-DINITRO-2-METHYLPHENOL	880 U	900 U	930 U	890 U	19000 U	930 U
4-BROMOPHENYL PHENYL ETHER	350 U	360 U	370 U	350 U	7500 U	370 U
4-CHLORO-3-METHYLPHENOL	350 U	360 U	370 U	350 U	7500 U	370 U
4-CHLOROANILINE	350 U	360 U	370 U	350 U	7500 U	370 U
4-CHLOROPHENYL PHENYL ETHER	350 U	360 U	370 U	350 U	7500 U	370 U
4-METHYLPHENOL	350 U	360 U	370 U	350 U	7500 U	370 U
4-NITROANILINE	880 U	900 U	930 U	890 U	19000 U	930 U
4-NITROPHENOL	880 U	900 U	930 U	890 U	19000 U	930 U
ACENAPHTHENE	42 J	360 U	150 J	2700	24000	160 J
ACENAPHTHYLENE	350 U	360 U	370 U	350 U	7500 U	370 U
ANTHRACENE	82 J	65 J	270 J	7300	48000	240 J
BENZO(A)ANTHRACENE	340 J	240 J	1200	11000	96000	900
BENZO(A)PYRENE	350 U	360 U	370 U	9700	85000	730
BENZO(B)FLUORANTHENE	710	340 J	370 U	7200	66000	1100
BENZO(G,H,I)PERYLENE	280 J	280 J	1700	5800 J	47000	550
BENZO(K)FLUORANTHENE	350 U	200 J	370 U	9500	47000	550
BIS(2-CHLOROETHOXY)METHANE	350 U	360 U	370 U	350 U	7500 U	370 U
BIS(2-CHLOROETHYL)ETHER	350 U	360 U	370 U	350 U	7500 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	85 J	86 J	93 J	340 J	7500 U	93 J
BUTYLBENZYL PHTHALATE	350 U	360 U	370 U	350 U	7500 U	370 U
CARBAZOLE	64 J	45 J	190 J	3600 J	31000	180 J

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER:	01-SS-01	01-SS-100	01-SS-02	01-SS-03	01-SS-04	01-SS-05
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97
LOCATION:	01-SS-01	01-SS-01	01-SS-02	01-SS-03	01-SS-04	01-SS-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:		01-SS-01				
SEMIVOLATILES (µg/kg)						
CHRYSENE	420	300 J	1300	12000	96000	870
DI-N-BUTYL PHTHALATE	350 U	360 U	41 B	68 B	7500 U	370 U
DI-N-OCTYL PHTHALATE	350 U	360 U	370 U	350 U	7500 U	370 U
DIBENZO(A,H)ANTHRACENE	350 U	360 U	370 U	2300	19000	220 J
DIBENZOFURAN	350 U	360 U	50 J	1900	16000	72 J
DIETHYL PHTHALATE	350 U	360 U	370 U	350 U	7500 U	370 U
DIMETHYL PHTHALATE	350 U	360 U	370 U	350 U	7500 U	370 U
FLUORANTHENE	850	590	2500	28000	230000	2200
FLUORENE	41 J	360 U	130 J	3800 J	23000	170 J
HEXACHLOROBENZENE	350 U	360 U	370 U	350 U	7500 U	370 U
HEXACHLOROBUTADIENE	350 U	360 U	370 U	350 U	7500 U	370 U
HEXACHLOROCYCLOPENTADIENE	350 UJ	360 UJ	370 UJ	350 U	7500 UJ	370 UJ
HEXACHLOROETHANE	350 U	360 U	370 U	350 U	7500 U	370 U
INDENO(1,2,3-CD)PYRENE	240 J	190 J	840	5200 J	43000	510
ISOPHORONE	350 U	360 U	370 U	350 U	7500 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	350 U	360 U	370 U	350 U	7500 U	370 U
N-NITROSODIPHENYLAMINE	350 U	360 U	370 U	350 U	7500 U	370 U
NAPHTHALENE	350 U	360 U	370 U	2000	19000	370 U
NITROBENZENE	350 U	360 U	370 U	350 U	7500 U	370 U
PENTACHLOROPHENOL	880 U	900 U	930 U	890 U	19000 U	930 U
PHENANTHRENE	420	250 J	1600	26000	20000	1300
PHENOL	350 U	360 U	370 U	350 U	7500 U	370 U
PYRENE	610	370	2100	20000	180000	1400
PESTICIDES/PCBs (µg/kg)						
4,4'-DDD	3.5 U	3.6 U	3.7 U	3.5 UJ	3.8 UJ	3.7 UJ

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER:	01-SS-01	01-SS-100	01-SS-02	01-SS-03	01-SS-04	01-SS-05
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97
LOCATION:	01-SS-01	01-SS-01	01-SS-02	01-SS-03	01-SS-04	01-SS-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:		01-SS-01				
PESTICIDES/PCBs (µg/kg)						
4,4'-DDE	37	27	74	60 J	14 J	3.7 UJ
4,4'-DDT	110 J	76	260	230 J	81 J	35 J
ALDRIN	1.8 U	1.8 U	1.9 U	1.8 UJ	1.9 UJ	1.8 UJ
ALPHA-BHC	1.8 U	1.8 U	1.9 U	1.8 UJ	1.9 UJ	1.8 UJ
ALPHA-CHLORDANE	4.7	4	450	69 J	1.9 UJ	1.8 UJ
AROCLOR-1016	35 U	36 U	37 U	35 UJ	38 UJ	37 UJ
AROCLOR-1221	71 U	71 U	74 U	71 UJ	75 UJ	74 UJ
AROCLOR-1232	35 U	36 U	37 U	35 UJ	38 UJ	37 UJ
AROCLOR-1242	35 U	36 U	37 U	35 UJ	38 UJ	37 UJ
AROCLOR-1248	35 U	36 U	37 U	35 UJ	38 UJ	37 UJ
AROCLOR-1254	35 U	36 U	37 U	35 UJ	38 UJ	37 UJ
AROCLOR-1260	530	410	980	950 J	630 J	1400 J
BETA-BHC	1.8 U	1.8 U	1.9 U	1.8 UJ	1.9 UJ	1.8 UJ
DELTA-BHC	1.8 U	1.8 U	1.9 U	1.8 UJ	1.9 UJ	1.8 UJ
DIELDRIN	6.9 J	14 J	61 J	3.5 UJ	3.8 UJ	99 J
ENDOSULFAN I	1.8 U	1.8 U	1.9 U	1.8 UJ	1.9 UJ	1.8 UJ
ENDOSULFAN II	3.5 U	3.6 U	3.7 U	3.5 UJ	3.8 UJ	3.7 UJ
ENDOSULFAN SULFATE	3.5 U	3.6 U	3.7 U	3.5 UJ	3.8 UJ	3.7 UJ
ENDRIN	3.5 U	3.6 U	3.7 U	3.5 UJ	3.8 UJ	3.7 UJ
ENDRIN ALDEHYDE	3.5 U	3.6 U	3.7 U	3.5 UJ	3.8 UJ	3.7 UJ
ENDRIN KETONE	3.5 U	3.6 U	3.7 U	3.5 UJ	3.8 UJ	3.7 UJ
GAMMA-BHC (LINDANE)	1.8 U	1.8 U	1.9 U	1.8 UJ	1.9 UJ	1.8 UJ
GAMMA-CHLORDANE	2.3	1.5 J	450	42 J	1.9 UJ	1.8 UJ
HEPTACHLOR	1.8 U	1.8 U	1.9 U	1.8 UJ	1.9 UJ	1.8 UJ
HEPTACHLOR EPOXIDE	1.8 U	1.8 U	150	1.8 UJ	1.9 UJ	1.8 UJ

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER:	01-SS-01	01-SS-100	01-SS-02	01-SS-03	01-SS-04	01-SS-05
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97
LOCATION:	01-SS-01	01-SS-01	01-SS-02	01-SS-03	01-SS-04	01-SS-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:		01-SS-01				
PESTICIDES/PCBs (µg/kg)						
METHOXYCHLOR	18 U	18 U	19 U	18 UJ	19 UJ	18 UJ
TOXAPHENE	180 U	180 U	190 U	180 UJ	190 UJ	180 UJ
ENERGETICS (µg/kg)						
1,3,5-TRINITROBENZENE	40.2 UJ		40.2 UJ	40.2 UJ	40.2 UJ	40.2 UJ
1,3-DINITROBENZENE	37.2 UJ		37.2 UJ	37.2 UJ	37.2 UJ	37.2 UJ
2,4 DINITROTOLUENE	51.6 UJ		51.6 UJ	51.6 UJ	51.6 UJ	51.6 UJ
2,4,6-TRINITROTOLUENE	92 UJ		92 UJ	92 UJ	92 UJ	92 UJ
2,6 DINITROTOLUENE	47.6 UJ		47.6 UJ	47.6 UJ	47.6 UJ	47.6 UJ
2-AMINO-4,6-DINITROTOLUENE	46.7 UJ		46.7 UJ	46.7 UJ	46.7 UJ	46.7 UJ
2-NITROTOLUENE	81.4 UJ		81.4 UJ	81.4 UJ	81.4 UJ	81.4 UJ
3-NITROTOLUENE	81.8 UJ		81.8 UJ	81.8 UJ	81.8 UJ	81.8 UJ
4-AMINO-2,6-DINITROTOLUENE	40.9 UJ		40.9 UJ	40.9 UJ	40.9 UJ	40.9 UJ
4-NITROTOLUENE	87.2 UJ		87.2 UJ	87.2 UJ	87.2 UJ	87.2 UJ
HMX	73 UJ		73 UJ	73 UJ	73 UJ	73 UJ
NITRO-BENZENE	35.2 UJ		35.2 UJ	35.2 UJ	35.2 UJ	35.2 UJ
RDX	50.9 UJ		50.9 UJ	50.9 UJ	50.9 UJ	50.9 UJ
TETRYL	162.7 UJ		163 UJ	163 UJ	163 UJ	163 UJ
METALS (mg/kg)						
ALUMINUM	5330	5230	6180	5600	5310	4470
ANTIMONY	0.55 UL	0.54 UL	1.4 L	0.64 L	0.59 UL	0.56 UL
ARSENIC	2	2.1	4.8	3	2	3.8
BARIUM	29.5	39.6	186	60.5	43.7	54.3
BERYLLIUM	0.02 U	0.02 U	0.02 U	0.08	0.02 U	0.12
CADMIUM	0.74	0.74	5.7	2.3	1.7	2.6
CALCIUM	2470	2320	19000	8070	6910	3210

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER:	01-SS-01	01-SS-100	01-SS-02	01-SS-03	01-SS-04	01-SS-05
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97	10/06/97
LOCATION:	01-SS-01	01-SS-01	01-SS-02	01-SS-03	01-SS-04	01-SS-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:		01-SS-01				
METALS (mg/kg)						
CHROMIUM	29.3	22.3	46.3	40	26	33.6
COBALT	2.2	2	7.2	7.8	6.2	5.7
COPPER	20.5	24.9	187	40	45.6	159
CYANIDE	0.17 U	0.16 U	0.19 U	0.19 U	0.21 U	0.19 U
IRON	7530	7470	19600	12900	8330	16100
LEAD	830	797	1170	135	196	122
MAGNESIUM	1420	1020	7100	5200	4520	7800
MANGANESE	102	94.1	345	326	206	170
MERCURY	0.08	0.09	0.43	1.7	1.1	0.78
NICKEL	16.7 K	12.7 K	70.6 K	47.8 K	59.7 K	78.2 K
POTASSIUM	323	335	553	560	393	350
SELENIUM	1.9 L	2.5 L	0.62 L	1.2 L	0.63 UR	0.61 UR
SILVER	0.17 U	0.17 U	5	0.35	0.41	0.17 U
SODIUM	42.3 U	49.2	134	90.8	225	43.4 U
THALLIUM	0.61 U	0.6 U	0.63 U	0.6 U	0.65 U	0.63 U
VANADIUM	19.7	19.1	37.5	30.7	39.3	25.4
ZINC	211	230	663	132	139	137
GENERAL CHEMISTRY ()						
PH	7.08	7.05	7.16	7.96	7.52	7.28

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER:	01-SS-06					
DEPTH (feet):	0-1'					
SAMPLE DATE:	10/06/97	/ /	/ /	/ /	/ /	/ /
LOCATION:	01-SS-06					
SAMPLE TYPE:	GRAB					
FIELD DUPLICATE OF:						
VOLATILES (µg/kg)						
1,1,1-TRICHLOROETHANE	11 U					
1,1,2,2-TETRACHLOROETHANE	11 U					
1,1,2-TRICHLOROETHANE	11 U					
1,1-DICHLOROETHANE	11 U					
1,1-DICHLOROETHENE	11 U					
1,2-DICHLOROETHANE	11 U					
1,2-DICHLOROETHENE (TOTAL)	11 U					
1,2-DICHLOROPROPANE	11 U					
2-BUTANONE	11 U					
2-HEXANONE	11 U					
4-METHYL-2-PENTANONE	11 U					
ACETONE	11 U					
BENZENE	11 U					
BROMODICHLOROMETHANE	11 U					
BROMOFORM	11 U					
BROMOMETHANE	11 U					
CARBON DISULFIDE	11 U					
CARBON TETRACHLORIDE	11 U					
CHLOROBENZENE	11 U					
CHLOROETHANE	11 U					
CHLOROFORM	11 U					
CHLOROMETHANE	11 U					
CIS-1,3-DICHLOROPROPENE	11 U					
DIBROMOCHLOROMETHANE	11 U					
ETHYLBENZENE	11 U					

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER: DEPTH (feet): SAMPLE DATE: LOCATION: SAMPLE TYPE: FIELD DUPLICATE OF:	01-SS-06 0-1' 10/06/97 01-SS-06 GRAB	/ /	/ /	/ /	/ /	/ /
VOLATILES (µg/kg)						
METHYLENE CHLORIDE	4 B					
STYRENE	11 U					
TETRACHLOROETHENE	11 U					
TOLUENE	11 U					
TRANS-1,3-DICHLOROPROPENE	11 U					
TRICHLOROETHENE	11 U					
VINYL CHLORIDE	11 U					
XYLENES, TOTAL	11 U					
SEMIVOLATILES (µg/kg)						
1,2,4-TRICHLOROBENZENE	3700 U					
1,2-DICHLOROBENZENE	3700 U					
1,3-DICHLOROBENZENE	3700 U					
1,4-DICHLOROBENZENE	3700 U					
2,2'-OXYBIS(1-CHLOROPROPANE)	3700 U					
2,4,5-TRICHLOROPHENOL	9300 U					
2,4,6-TRICHLOROPHENOL	3700 U					
2,4-DICHLOROPHENOL	3700 U					
2,4-DIMETHYLPHENOL	3700 U					
2,4-DINITROPHENOL	9300 U					
2,4-DINITROTOLUENE	3700 U					
2,6-DINITROTOLUENE	3700 U					
2-CHLORONAPHTHALENE	3700 U					
2-CHLOROPHENOL	3700 U					
2-METHYLNAPHTHALENE	400 J					
2-METHYLPHENOL	3700 U					

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER:	01-SS-06					
DEPTH (feet):	0-1'					
SAMPLE DATE:	10/06/97	/ /	/ /	/ /	/ /	/ /
LOCATION:	01-SS-06					
SAMPLE TYPE:	GRAB					
FIELD DUPLICATE OF:						
SEMIVOLATILES (µg/kg)						
2-NITROANILINE	9300 U					
2-NITROPHENOL	3700 U					
3,3'-DICHLOROBENZIDINE	3700 U					
3-NITROANILINE	9300 U					
4,6-DINITRO-2-METHYLPHENOL	9300 U					
4-BROMOPHENYL PHENYL ETHER	3700 U					
4-CHLORO-3-METHYLPHENOL	3700 U					
4-CHLOROANILINE	3700 U					
4-CHLOROPHENYL PHENYL ETHER	3700 U					
4-METHYLPHENOL	3700 U					
4-NITROANILINE	9300 U					
4-NITROPHENOL	9300 U					
ACENAPHTHENE	3500 J					
ACENAPHTHYLENE	3700 U					
ANTHRACENE	6700					
BENZO(A)ANTHRACENE	15000					
BENZO(A)PYRENE	13000					
BENZO(B)FLUORANTHENE	14000					
BENZO(G,H,I)PERYLENE	6200					
BENZO(K)FLUORANTHENE	11000					
BIS(2-CHLOROETHOXY)METHANE	3700 U					
BIS(2-CHLOROETHYL)ETHER	3700 U					
BIS(2-ETHYLHEXYL)PHTHALATE	940 J					
BUTYLBENZYL PHTHALATE	3700 U					
CARBAZOLE	4100					

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER:	01-SS-06					
DEPTH (feet):	0-1'					
SAMPLE DATE:	10/06/97	/ /	/ /	/ /	/ /	/ /
LOCATION:	01-SS-06					
SAMPLE TYPE:	GRAB					
FIELD DUPLICATE OF:						
SEMIVOLATILES (µg/kg)						
CHRYSENE	16000					
DI-N-BUTYL PHTHALATE	3700 U					
DI-N-OCTYL PHTHALATE	3700 U					
DIBENZO(A,H)ANTHRACENE	3400 J					
DIBENZOFURAN	2000 J					
DIETHYL PHTHALATE	3700 U					
DIMETHYL PHTHALATE	3700 U					
FLUORANTHENE	37000					
FLUORENE	4600					
HEXACHLOROBENZENE	3700 U					
HEXACHLOROBUTADIENE	3700 U					
HEXACHLOROCYCLOPENTADIENE	3700 UJ					
HEXACHLOROETHANE	3700 U					
INDENO(1,2,3-CD)PYRENE	6500					
ISOPHORONE	3700 U					
N-NITROSO-DI-N-PROPYLAMINE	3700 U					
N-NITROSODIPHENYLAMINE	3700 U					
NAPHTHALENE	3700 U					
NITROBENZENE	3700 U					
PENTACHLOROPHENOL	9300 U					
PHENANTHRENE	28000					
PHENOL	3700 U					
PYRENE	28000					
PESTICIDES/PCBs (µg/kg)						
4,4'-DDD	3.7 UJ					

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER:	01-SS-06					
DEPTH (feet):	0-1'					
SAMPLE DATE:	10/06/97	/ /	/ /	/ /	/ /	/ /
LOCATION:	01-SS-06					
SAMPLE TYPE:	GRAB					
FIELD DUPLICATE OF:						
PESTICIDES/PCBs (µg/kg)						
4,4'-DDE	3.7 J					
4,4'-DDT	190 J					
ALDRIN	1.9 UJ					
ALPHA-BHC	1.9 UJ					
ALPHA-CHLORDANE	76 J					
AROCLOR-1016	37 UJ					
AROCLOR-1221	74 UJ					
AROCLOR-1232	37 UJ					
AROCLOR-1242	37 UJ					
AROCLOR-1248	37 UJ					
AROCLOR-1254	37 UJ					
AROCLOR-1260	1500 J					
BETA-BHC	1.9 UJ					
DELTA-BHC	1.9 UJ					
DIELDRIN	3.7 UJ					
ENDOSULFAN I	1.9 UJ					
ENDOSULFAN II	3.7 UJ					
ENDOSULFAN SULFATE	3.7 UJ					
ENDRIN	3.7 UJ					
ENDRIN ALDEHYDE	3.7 UJ					
ENDRIN KETONE	3.7 UJ					
GAMMA-BHC (LINDANE)	1.9 UJ					
GAMMA-CHLORDANE	26 J					
HEPTACHLOR	1.9 UJ					
HEPTACHLOR EPOXIDE	1.9 UJ					

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER: DEPTH (feet): SAMPLE DATE: LOCATION: SAMPLE TYPE: FIELD DUPLICATE OF:	01-SS-06 0-1' 10/06/97 01-SS-06 GRAB	/ /	/ /	/ /	/ /	/ /
PESTICIDES/PCBs (µg/kg)						
METHOXYCHLOR	19 UJ					
TOXAPHENE	190 UJ					
ENERGETICS (µg/kg)						
1,3,5-TRINITROBENZENE	40.2 UJ					
1,3-DINITROBENZENE	37.2 UJ					
2,4 DINITROTOLUENE	51.6 UJ					
2,4,6-TRINITROTOLUENE	92 UJ					
2,6 DINITROTOLUENE	47.6 UJ					
2-AMINO-4,6-DINITROTOLUENE	46.7 UJ					
2-NITROTOLUENE	81.4 UJ					
3-NITROTOLUENE	81.8 UJ					
4-AMINO-2,6-DINITROTOLUENE	40.9 UJ					
4-NITROTOLUENE	87.2 UJ					
HMX	73 UJ					
NITRO-BENZENE	35.2 UJ					
RDX	50.9 UJ					
TETRYL	163 UJ					
METALS (mg/kg)						
ALUMINUM	18500					
ANTIMONY	1 J					
ARSENIC	7.2					
BARIUM	68.3					
BERYLLIUM	1.8					
CADMIUM	5.3 K					
CALCIUM	1910					

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER: DEPTH (feet): SAMPLE DATE: LOCATION: SAMPLE TYPE: FIELD DUPLICATE OF:	01-SS-06 0-1' 10/06/97 01-SS-06 GRAB	/ /	/ /	/ /	/ /	/ /
METALS (mg/kg)						
CHROMIUM	56.6 K					
COBALT	16.3					
COPPER	99.1					
CYANIDE	0.23 U					
IRON	87000					
LEAD	301					
MAGNESIUM	3530					
MANGANESE	535					
MERCURY	0.3					
NICKEL	53.1 K					
POTASSIUM	1770					
SELENIUM	1.8 L					
SILVER	1					
SODIUM	129					
THALLIUM	0.65 UL					
VANADIUM	87.2					
ZINC	356					
GENERAL CHEMISTRY ()						
PH	7.01					

SUMMARY OF ANALYTICAL RESULTS - UNFILTERED GROUNDWATER
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER: SAMPLE DATE: LOCATION: FIELD DUPLICATE OF:	01-WP-01 11/13/97 01-WP-01	01-WP-02 11/14/97 01-WP-02	01-WP-03 11/14/97 01-WP-03	01-WP-04 11/14/97 01-WP-04	01-WP-05 11/14/97 01-WP-05	/ /
VOLATILES (µg/L)						
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	1 U	1 U	
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	
1,1-DICHLOROETHANE	1 U	1 U	1 U	12	1 U	
1,1-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	
1,2-DIBROMO-3-CHLOROPROPANE	1 U	1 U	1 U	1 U	1 U	
1,2-DIBROMOETHANE	1 U	1 U	1 U	1 U	1 U	
1,2-DICHLOROETHANE	1 U	1 U	1 U	13	1 U	
1,2-DICHLOROPROPANE	1 U	1 U	1 U	1 U	1 U	
2-BUTANONE	5 UR	5 UR	5 UR	5 UR	5 UR	
2-HEXANONE	5 U	5 U	5 U	5 U	5 U	
4-METHYL-2-PENTANONE	5 U	5 U	5 U	5 U	5 U	
ACETONE	5 UR	5 UR	5 UR	5 UR	5 UR	
BENZENE	1 U	1 U	1 U	1 U	1 U	
BROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	
BROMODICHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	
BROMOFORM	1 U	1 U	1 U	1 U	1 U	
BROMOMETHANE	1 U	1 U	1 U	1 U	1 U	
CARBON DISULFIDE	1 U	1 U	1 U	1 U	1 U	
CARBON TETRACHLORIDE	1 U	1 U	1 U	1 U	1 U	
CHLOROBENZENE	2	4	3	1 U	1 U	
CHLOROETHANE	1 U	1 U	1 U	1 U	1 U	
CHLOROFORM	1 U	1 U	1 U	2	2	
CHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	
CIS-1,2-DICHLOROETHENE	1 U	1 U	1 U	8	1 U	
CIS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U	1 U	
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	

SUMMARY OF ANALYTICAL RESULTS - UNFILTERED GROUNDWATER
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER: SAMPLE DATE: LOCATION: FIELD DUPLICATE OF:	01-WP-01 11/13/97 01-WP-01	01-WP-02 11/14/97 01-WP-02	01-WP-03 11/14/97 01-WP-03	01-WP-04 11/14/97 01-WP-04	01-WP-05 11/14/97 01-WP-05	/ /
VOLATILES (µg/L)						
ETHYLBENZENE	1 U	1 U	1 U	1 U	1 U	
METHYLENE CHLORIDE	2 UJ	2 UJ	2 UJ	1 B	2 UJ	
STYRENE	1 U	1 U	1 U	1 U	1 U	
TETRACHLOROETHENE	1 U	1 U	1 U	1 U	1 U	
TOLUENE	1 U	1 U	1 U	1 U	1 U	
TRANS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	
TRANS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U	1 U	
TRICHLOROETHENE	1 U	1 U	1 U	1	1 U	
VINYL CHLORIDE	1 U	1 U	1 U	1 U	1 U	
XYLENES, TOTAL	1 U	1 U	1 U	1 U	1 U	
SEMIVOLATILES (µg/L)						
1,2,4-TRICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	
1,2-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	
1,3-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	
1,4-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	
2,2'-OXYBIS(1-CHLOROPROPANE)	5 U	5 U	5 U	5 U	6 U	
2,4,5-TRICHLOROPHENOL	21 U	20 U	22 U	21 U	22 U	
2,4,6-TRICHLOROPHENOL	5 U	5 U	5 U	5 U	6 U	
2,4-DICHLOROPHENOL	5 U	5 U	5 U	5 U	6 U	
2,4-DIMETHYLPHENOL	5 U	5 U	5 U	5 U	6 U	
2,4-DINITROPHENOL	21 U	20 U	22 U	21 U	22 U	
2,4-DINITROTOLUENE	5 U	5 U	5 U	5 U	6 U	
2,6-DINITROTOLUENE	5 U	5 U	5 U	5 U	6 U	
2-CHLORONAPHTHALENE	5 U	5 U	5 U	5 U	6 U	
2-CHLOROPHENOL	5 U	5 U	5 U	5 U	6 U	
2-METHYLNAPHTHALENE	5 U	5 U	5 U	5 U	6 U	
2-METHYLPHENOL	5 U	5 U	5 U	5 U	6 U	

SUMMARY OF ANALYTICAL RESULTS - UNFILTERED GROUNDWATER
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER: SAMPLE DATE: LOCATION: FIELD DUPLICATE OF:	01-WP-01 11/13/97 01-WP-01	01-WP-02 11/14/97 01-WP-02	01-WP-03 11/14/97 01-WP-03	01-WP-04 11/14/97 01-WP-04	01-WP-05 11/14/97 01-WP-05	/ /
SEMIVOLATILES (µg/L)						
2-NITROANILINE	21 U	20 U	22 U	21 U	22 U	
2-NITROPHENOL	5 U	5 U	5 U	5 U	6 U	
3,3'-DICHLOROBENZIDINE	5 U	5 U	5 U	5 U	6 U	
3-NITROANILINE	21 U	20 U	22 U	21 U	22 U	
4,6-DINITRO-2-METHYLPHENOL	21 U	20 U	22 U	21 U	22 U	
4-BROMOPHENYL PHENYL ETHER	5 U	5 U	5 U	5 U	6 U	
4-CHLORO-3-METHYLPHENOL	5 U	5 U	5 U	5 U	6 U	
4-CHLOROANILINE	5 U	5 U	5 U	5 U	6 U	
4-CHLOROPHENYL PHENYL ETHER	5 U	5 U	5 U	5 U	6 U	
4-METHYLPHENOL	5 U	5 U	5 U	5 U	6 U	
4-NITROANILINE	21 U	20 U	22 U	21 U	22 U	
4-NITROPHENOL	21 U	20 U	22 U	21 U	22 U	
ACENAPHTHENE	5 U	5 U	5 U	5 U	6 U	
ACENAPHTHYLENE	5 U	5 U	5 U	5 U	6 U	
ANTHRACENE	5 U	5 U	5 U	5 U	6 U	
BENZO(A)ANTHRACENE	5 U	5 U	5 U	5 U	6 U	
BENZO(A)PYRENE	5 U	5 U	5 U	5 U	6 U	
BENZO(B)FLUORANTHENE	5 U	5 U	5 U	5 U	6 U	
BENZO(G,H,I)PERYLENE	5 U	5 U	5 U	5 U	6 U	
BENZO(K)FLUORANTHENE	5 U	5 U	5 U	5 U	6 U	
BIS(2-CHLOROETHOXY)METHANE	5 U	5 U	5 U	5 U	6 U	
BIS(2-CHLOROETHYL)ETHER	5 U	5 U	5 U	5 U	6 U	
BIS(2-ETHYLHEXYL)PHTHALATE	5 U	5 U	5 U	4 J	3 J	
BUTYLBENZYL PHTHALATE	5 U	5 U	5 U	5 U	6 U	
CHRYSENE	5 U	5 U	5 U	5 U	6 U	
DI-N-BUTYL PHTHALATE	3 B	4 B	4 B	5 B	4 B	
DI-N-OCTYL PHTHALATE	5 U	5 U	5 U	5 U	6 U	

SUMMARY OF ANALYTICAL RESULTS - UNFILTERED GROUNDWATER
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER: SAMPLE DATE: LOCATION: FIELD DUPLICATE OF:	01-WP-01 11/13/97 01-WP-01	01-WP-02 11/14/97 01-WP-02	01-WP-03 11/14/97 01-WP-03	01-WP-04 11/14/97 01-WP-04	01-WP-05 11/14/97 01-WP-05	/ /
SEMIVOLATILES (µg/L)						
DIBENZO(A,H)ANTHRACENE	5 U	5 U	5 U	5 U	6 U	
DIBENZOFURAN	5 U	5 U	5 U	5 U	6 U	
DIETHYL PHTHALATE	5 U	5 U	5 U	5 U	6 U	
DIMETHYL PHTHALATE	5 U	5 U	5 U	5 U	6 U	
FLUORANTHENE	5 U	5 U	5 U	5 U	6 U	
FLUORENE	5 U	5 U	5 U	5 U	6 U	
HEXACHLOROBENZENE	5 U	5 U	5 U	5 U	6 U	
HEXACHLOROBUTADIENE	5 U	5 U	5 U	5 U	6 U	
HEXACHLOROCYCLOPENTADIENE	5 UJ	5 UJ	5 UJ	5 UJ	6 UJ	
HEXACHLOROETHANE	5 U	5 U	5 U	5 U	6 U	
INDENO(1,2,3-CD)PYRENE	5 U	5 U	5 U	5 U	6 U	
ISOPHORONE	5 U	5 U	5 U	5 U	6 U	
N-NITROSO-DI-N-PROPYLAMINE	5 U	5 U	5 U	5 U	6 U	
N-NITROSODIPHENYLAMINE	5 U	5 U	5 U	5 U	6 U	
NAPHTHALENE	5 U	5 U	5 U	5 U	6 U	
NITROBENZENE	5 U	5 U	5 U	5 U	6 U	
PENTACHLOROPHENOL	21 U	20 U	22 U	21 U	22 U	
PHENANTHRENE	5 U	5 U	5 U	5 U	6 U	
PHENOL	5 U	5 U	5 U	5 U	6 U	
PYRENE	5 U	5 U	5 U	5 U	6 U	
PESTICIDES/PCBs (µg/L)						
4,4'-DDD	0.021 UJ	0.021 U	0.002 J	0.021 U	0.023 UJ	
4,4'-DDE	0.021 UJ	0.021 U	0.023 U	0.021 U	0.023 UJ	
4,4'-DDT	0.021 UJ	0.021 U	0.023 U	0.021 U	0.023 UJ	
ALDRIN	0.011 UJ	0.011 U	0.006 J	0.011 U	0.011 UJ	
ALPHA-BHC	0.011 UJ	0.011 U	0.012 U	0.011 U	0.001 R	
ALPHA-CHLORDANE	0.011 UJ	0.011 U	0.012 U	0.011 U	0.011 UJ	

SUMMARY OF ANALYTICAL RESULTS - UNFILTERED GROUNDWATER
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER: SAMPLE DATE: LOCATION: FIELD DUPLICATE OF:	01-WP-01 11/13/97 01-WP-01	01-WP-02 11/14/97 01-WP-02	01-WP-03 11/14/97 01-WP-03	01-WP-04 11/14/97 01-WP-04	01-WP-05 11/14/97 01-WP-05	/ /
PESTICIDES/PCBs (µg/L)						
AROCLOR-1016	0.21 UJ	0.21 U	0.23 U	0.21 U	0.23 UJ	
AROCLOR-1221	0.42 UJ	0.42 U	0.46 U	0.43 U	0.46 UJ	
AROCLOR-1232	0.21 UJ	0.21 U	0.23 U	0.21 U	0.23 UJ	
AROCLOR-1242	0.21 UJ	0.21 U	0.23 U	0.21 U	0.23 UJ	
AROCLOR-1248	0.21 UJ	0.21 U	0.23 U	0.21 U	0.23 UJ	
AROCLOR-1254	0.21 UJ	0.21 U	0.23 U	0.21 U	0.23 UJ	
AROCLOR-1260	0.21 UJ	0.21 U	0.23 U	0.21 U	0.23 UJ	
BETA-BHC	0.011 UJ	0.011 U	0.012 U	0.011 U	0.011 UJ	
DELTA-BHC	0.011 UJ	0.011 U	0.012 U	0.011 U	0.011 UJ	
DIELDRIN	0.021 UJ	0.021 U	0.023 U	0.021 U	0.023 UJ	
ENDOSULFAN I	0.011 UJ	0.011 U	0.012 U	0.011 U	0.011 UJ	
ENDOSULFAN II	0.021 UJ	0.021 U	0.023 U	0.021 U	0.023 UJ	
ENDOSULFAN SULFATE	0.021 UJ	0.021 U	0.023 U	0.021 U	0.023 UJ	
ENDRIN	0.021 UJ	0.021 U	0.023 U	0.021 U	0.023 UJ	
ENDRIN ALDEHYDE	0.021 UJ	0.021 U	0.023 U	0.021 U	0.023 UJ	
ENDRIN KETONE	0.021 UJ	0.021 U	0.023 U	0.021 U	0.023 UJ	
GAMMA-BHC (LINDANE)	0.011 UJ	0.011 U	0.012 U	0.011 U	0.011 UJ	
GAMMA-CHLORDANE	0.011 UJ	0.011 U	0.012 U	0.011 U	0.011 UJ	
HEPTACHLOR	0.011 UJ	0.011 U	0.012 U	0.011 U	0.011 UJ	
HEPTACHLOR EPOXIDE	0.002 R	0.003 J	0.002 R	0.002 R	0.011 UJ	
METHOXYCHLOR	0.11 UJ	0.11 U	0.12 U	0.11 U	0.11 UJ	
TOXAPHENE	1.1 UJ	1.1 U	1.2 U	1.1 U	1.1 UJ	
ENERGETICS (µg/L)						
1,3,5-TRINITROBENZENE	0.6 U	0.6 U	0.6 UJ	0.6 UR	0.6 UR	
1,3-DINITROBENZENE	0.6 U	0.6 U	0.6 UJ	0.6 UR	0.6 UR	
2,4 DINITROTOLUENE	0.6 U	0.6 U	0.6 UJ	0.6 UR	0.6 UR	
2,4,6-TRINITROTOLUENE	0.6 U	0.6 U	0.6 UJ	0.6 UR	0.6 UR	

SUMMARY OF ANALYTICAL RESULTS - UNFILTERED GROUNDWATER
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER: SAMPLE DATE: LOCATION: FIELD DUPLICATE OF:	01-WP-01 11/13/97 01-WP-01	01-WP-02 11/14/97 01-WP-02	01-WP-03 11/14/97 01-WP-03	01-WP-04 11/14/97 01-WP-04	01-WP-05 11/14/97 01-WP-05	/ /
ENERGETICS (µg/L)						
2,6 DINITROTOLUENE	0.6 U	0.6 U	0.6 UJ	0.6 UR	0.6 UR	
2-AMINO-4,6-DINITROTOLUENE	0.6 U	0.6 U	0.6 UJ	0.6 UR	0.6 UR	
2-NITROTOLUENE	1.3 U	1.3 U	1.3 UJ	1.3 UR	1.3 UR	
3-NITROTOLUENE	1.3 U	1.3 U	1.3 UJ	1.3 UR	1.3 UR	
4-AMINO-2,6-DINITROTOLUENE	0.6 U	0.6 U	0.6 UJ	0.6 UR	0.6 UR	
4-NITROTOLUENE	1.3 U	1.3 U	1.3 UJ	1 3 UR	1.3 UR	
HMX	1.3 U	1.3 U	1.3 UJ	1.3 UR	1.3 UR	
NITRO-BENZENE	0.6 U	0.6 U	0.6 UJ	0.6 UR	0.6 UR	
RDX	1.3 U	1.3 U	1.3 UJ	1.3 UR	1.3 UR	
TETRYL	1.3 U	1.3 U	1.3 UJ	1.3 UR	1.3 UR	
METALS (µg/L)						
ALUMINUM	24000	6960	117 B	126 B	568	
ANTIMONY	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	
ARSENIC	3 UL	3 UL	3 UL	3 UL	3 UL	
BARIUM	147	207	235	281	259	
BERYLLIUM	2.4 B	0.7 B	0.26 B	0.53 B	0.71 B	
CADMIUM	0.72 B	0.36 B	0.59 B	0.53 B	0.7 B	
CALCIUM	19700	56200	31600	9440 K	14800	
CHROMIUM	73.7	10.4	0.76 B	2.1 B	2.5 B	
COBALT	53.2	20.1	26.3	16.8	3.1 B	
COPPER	66.8	22.7	4.9 B	9.9	3.6 B	
CYANIDE	5 U	5 U	5 U	5 U	5 U	
IRON	37000	12300	3600	162 B	593	
LEAD	19.9 B	12.9 B	6.4 B	3.7 B	1 U	
MAGNESIUM	7950 K	8330 K	8210 K	7310 K	9520 K	
MANGANESE	2400	3210	6300	1170	844	
MERCURY	0.1 UR	0.1 U	0.1 U	0.1 U	0.1 U	

SUMMARY OF ANALYTICAL RESULTS - UNFILTERED GROUNDWATER
SITE 01 - PARKING LOT LANDFILL
NSWC WHITE OAK

SAMPLE NUMBER: SAMPLE DATE: LOCATION: FIELD DUPLICATE OF:	01-WP-01 11/13/97 01-WP-01	01-WP-02 11/14/97 01-WP-02	01-WP-03 11/14/97 01-WP-03	01-WP-04 11/14/97 01-WP-04	01-WP-05 11/14/97 01-WP-05	/ /
METALS (µg/L)						
NICKEL	158	15	15.6	15.2	17.2	
POTASSIUM	7460 L	7930 L	5150 L	5850 L	3400 L	
SELENIUM	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	
SILVER	0.9 UL	0.9 UL	0.9 UL	0.9 UL	0.9 UL	
SODIUM	43400	104000	57400	45200	34000	
THALLIUM	4.6 B	3.5 B	3.2 B	2.3 U	2.3 U	
VANADIUM	18.6	8.1 B	1 U	1 U	1 U	
ZINC	94	39.8	18	23.8	31.5	

APPENDIX C

SITE 28
SOIL DATA

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
VOLATILES (µg/kg)						
1,1,1-TRICHLOROETHANE	11 U	12 U	12 U	11 U	11 U	12 U
1,1,2,2-TETRACHLOROETHANE	11 U	12 U	12 U	11 U	11 U	12 U
1,1,2-TRICHLOROETHANE	11 U	12 U	12 U	11 U	11 U	12 U
1,1-DICHLOROETHANE	11 U	12 U	12 U	11 U	11 U	12 U
1,1-DICHLOROETHENE	11 U	12 U	12 U	11 U	11 U	12 U
1,2-DICHLOROETHANE	11 U	12 U	12 U	11 U	11 U	12 U
1,2-DICHLOROETHENE (TOTAL)	11 U	12 U	12 U	11 U	11 U	12 U
1,2-DICHLOROPROPANE	11 U	12 U	12 U	11 U	11 U	12 U
2-BUTANONE	11 UJ	12 UJ	12 UJ	11 UJ	11 U	12 U
2-HEXANONE	11 U	12 U	12 U	11 U	11 U	12 U
4-METHYL-2-PENTANONE	11 U	12 U	12 U	11 U	11 U	12 U
ACETONE	11 U	12 U	12 U	11 U	11 U	12 U
BENZENE	11 U	12 U	12 U	11 U	11 U	12 U
BROMODICHLOROMETHANE	11 U	12 U	12 U	11 U	11 U	12 U
BROMOFORM	11 U	12 U	12 U	11 U	11 U	12 U
BROMOMETHANE	11 U	12 U	12 U	11 U	11 U	12 U
CARBON DISULFIDE	11 U	12 U	12 U	11 U	11 U	12 U
CARBON TETRACHLORIDE	11 U	12 U	12 U	11 U	11 U	12 U
CHLOROBENZENE	11 U	12 U	12 U	11 U	11 U	12 U
CHLOROETHANE	11 U	12 U	12 U	11 U	11 U	12 U
CHLOROFORM	11 U	12 U	12 U	11 U	11 U	12 U
CHLOROMETHANE	11 U	12 U	12 U	11 U	11 U	12 U
CIS-1,3-DICHLOROPROPENE	11 U	12 U	12 U	11 U	11 U	12 U
DIBROMOCHLOROMETHANE	11 U	12 U	12 U	11 U	11 U	12 U
ETHYLBENZENE	11 U	12 U	12 U	11 U	11 U	12 U

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
VOLATILES (µg/kg)						
METHYLENE CHLORIDE	3 B	3 B	2 B	5 B	11 B	9 B
STYRENE	11 U	12 U	12 U	11 U	11 U	12 U
TETRACHLOROETHENE	11 U	12 U	12 U	11 U	11 U	12 U
TOLUENE	11 U	12 U	12 U	11 U	11 U	12 U
TRANS-1,3-DICHLOROPROPENE	11 U	12 U	12 U	11 U	11 U	12 U
TRICHLOROETHENE	11 U	12 U	12 U	11 U	11 U	12 U
VINYL CHLORIDE	11 U	12 U	12 U	11 U	11 U	12 U
XYLENES, TOTAL	11 U	12 U	12 U	11 U	11 U	12 U
SEMIVOLATILES (µg/kg)						
1,2,4-TRICHLOROBENZENE	370 U	400 U	410 U	390 U	360 U	410 U
1,2-DICHLOROBENZENE	370 U	400 U	410 U	390 U	360 U	410 U
1,3-DICHLOROBENZENE	370 U	400 U	410 U	390 U	360 U	410 U
1,4-DICHLOROBENZENE	370 U	400 U	410 U	390 U	360 U	410 U
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	400 U	410 U	390 U	360 U	410 U
2,4,5-TRICHLOROPHENOL	940 U	990 U	1000 U	980 U	900 U	1000 U
2,4,6-TRICHLOROPHENOL	370 U	400 U	410 U	390 U	360 U	410 U
2,4-DICHLOROPHENOL	370 U	400 U	410 U	390 U	360 U	410 U
2,4-DIMETHYLPHENOL	370 U	400 U	410 U	390 U	360 U	410 U
2,4-DINITROPHENOL	940 U	990 U	1000 U	980 U	900 U	1000 U
2,4-DINITROTOLUENE	370 U	400 U	410 U	390 U	360 U	410 U
2,6-DINITROTOLUENE	370 U	400 U	410 U	390 U	360 U	410 U
2-CHLORONAPHTHALENE	370 U	400 U	410 U	390 U	360 U	410 U
2-CHLOROPHENOL	370 U	400 U	410 U	390 U	360 U	410 U
2-METHYLNAPHTHALENE	370 U	400 U	410 U	390 U	360 U	410 U
2-METHYLPHENOL	370 U	400 U	410 U	390 U	360 U	410 U

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
SEMIVOLATILES (µg/kg)						
2-NITROANILINE	940 U	990 U	1000 U	980 U	900 U	1000 U
2-NITROPHENOL	370 U	400 U	410 U	390 U	360 U	410 U
3,3'-DICHLOROBENZIDINE	370 U	400 U	410 U	390 U	360 U	410 U
3-NITROANILINE	940 U	990 U	1000 U	980 U	900 U	1000 U
4,6-DINITRO-2-METHYLPHENOL	940 U	990 UJ	1000 U	980 UJ	900 UJ	1000 UJ
4-BROMOPHENYL PHENYL ETHER	370 U	400 U	410 U	390 U	360 U	410 U
4-CHLORO-3-METHYLPHENOL	370 U	400 U	410 U	390 U	360 U	410 U
4-CHLOROANILINE	370 U	400 U	410 U	390 U	360 U	410 U
4-CHLOROPHENYL PHENYL ETHER	370 U	400 U	410 U	390 U	360 U	410 U
4-METHYLPHENOL	370 U	400 U	410 U	390 U	46 J	410 U
4-NITROANILINE	940 U	990 U	1000 U	980 U	900 U	1000 U
4-NITROPHENOL	940 U	990 U	1000 U	980 U	900 U	1000 U
ACENAPHTHENE	370 U	400 U	410 U	280 J	360 U	410 U
ACENAPHTHYLENE	370 U	400 U	410 U	390 U	360 U	410 U
ANTHRACENE	370 U	400 U	410 U	350 J	360 U	410 U
BENZO(A)ANTHRACENE	370 U	400 U	410 U	2000	77 J	57 J
BENZO(A)PYRENE	370 U	400 U	410 U	2500	78 J	59 J
BENZO(B)FLUORANTHENE	370 U	400 U	410 U	2400	80 J	79 J
BENZO(G,H,I)PERYLENE	370 U	400 U	410 U	1900	360 U	410 U
BENZO(K)FLUORANTHENE	370 U	400 U	410 U	2500	86 J	51 J
BIS(2-CHLOROETHOXY)METHANE	370 U	400 U	410 U	390 U	360 U	410 U
BIS(2-CHLOROETHYL)ETHER	370 U	400 U	410 U	390 U	360 U	410 U
BIS(2-ETHYLHEXYL)PHTHALATE	370 U	400 U	410 U	130 B	360 U	52 B
BUTYLBENZYL PHTHALATE	370 U	400 U	410 U	390 U	360 U	410 U
CARBAZOLE	370 U	400 U	410 U	190 J	360 U	410 U

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
SEMIVOLATILES (µg/kg)						
CHRYSENE	370 U	400 U	410 U	2300	92 J	74 J
DI-N-BUTYL PHTHALATE	370 U	45 J	410 U	390 U	47 J	99 J
DI-N-OCTYL PHTHALATE	370 U	400 U	410 U	390 U	360 U	410 U
DIBENZO(A,H)ANTHRACENE	370 U	400 U	410 U	390 U	360 U	410 U
DIBENZOFURAN	370 U	400 U	410 U	71 J	360 U	410 U
DIETHYL PHTHALATE	370 U	400 U	410 U	390 U	360 U	410 U
DIMETHYL PHTHALATE	370 U	400 U	410 U	390 U	360 U	410 U
FLUORANTHENE	370 U	400 U	410 U	4000	200 J	120 J
FLUORENE	370 U	400 U	410 U	170 J	360 U	410 U
HEXACHLOROBENZENE	370 U	400 U	410 U	390 U	360 U	410 U
HEXACHLOROBUTADIENE	370 U	400 U	410 U	390 U	360 U	410 U
HEXACHLOROCYCLOPENTADIENE	370 U	400 U	410 U	390 U	360 U	410 U
HEXACHLOROETHANE	370 U	400 U	410 U	390 U	360 U	410 U
INDENO(1,2,3-CD)PYRENE	370 U	400 U	410 U	1600	360 U	410 U
ISOPHORONE	370 U	400 U	410 U	390 U	360 U	410 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	400 U	410 U	390 U	360 U	410 U
N-NITROSODIPHENYLAMINE	370 U	400 U	410 U	390 U	360 U	410 U
NAPHTHALENE	370 U	400 U	410 U	390 U	360 U	410 U
NITROBENZENE	370 U	400 U	410 U	390 U	360 U	410 U
PENTACHLOROPHENOL	940 U	990 U	1000 U	980 U	900 U	1000 U
PHENANTHRENE	370 U	400 U	410 U	2600	140 J	82 J
PHENOL	370 U	400 U	410 U	390 U	360 U	410 U
PYRENE	370 U	400 U	410 U	5100	210 J	130 J
PESTICIDES/PCBs (µg/kg)						
4,4'-DDD	3.7 U	4 UL	4 U	3.7 U	3.6 U	4 U

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
PESTICIDES/PCBs (µg/kg)						
4,4'-DDE	3.7 U	4 UL	4 U	3.7 U	0.58 J	4 U
4,4'-DDT	3.7 U	4 UL	4 U	3.7 U	3.6 U	4 U
ALDRIN	1.9 U	2 UL	2 U	1.8 U	1.8 U	2 U
ALPHA-BHC	1.9 U	2 UL	2 U	1.8 U	1.8 U	2 U
ALPHA-CHLORDANE	1.9 U	2 UL	2 U	1.8 U	1.8 U	2 U
AROCLOR-1016	37 U	40 UL	40 U	37 U	36 U	40 U
AROCLOR-1221	75 U	79 UL	81 U	73 U	72 U	81 U
AROCLOR-1232	37 U	40 UL	40 U	37 U	36 U	40 U
AROCLOR-1242	37 U	40 UL	40 U	37 U	36 U	40 U
AROCLOR-1248	37 U	40 UL	40 U	37 U	36 U	40 U
AROCLOR-1254	37 U	40 UL	40 U	37 U	36 U	40 U
AROCLOR-1260	71	12 J	19 J	210	42 J	4700
BETA-BHC	1.9 U	2 UL	2 U	1.8 U	1.8 U	2 U
DELTA-BHC	1.9 U	2 UL	2 U	0.8 J	1.8 U	2 U
DIELDRIN	3.7 U	0.34 J	4 U	3.7 U	3.6 U	4 U
ENDOSULFAN I	1.9 U	2 UL	2 U	1.8 U	1.8 U	2 U
ENDOSULFAN II	3.7 U	4 UL	4 U	3.7 U	3.6 U	4 U
ENDOSULFAN SULFATE	3.7 U	4 UL	4 U	3.7 U	3.6 U	4 U
ENDRIN	3.7 U	4 UL	4 U	3.7 U	3.6 U	4 U
ENDRIN ALDEHYDE	3.7 U	4 UL	4 U	3.7 U	3.6 U	4 U
ENDRIN KETONE	3.7 U	4 UL	4 U	3.7 U	3.6 U	4 U
GAMMA-BHC (LINDANE)	1.9 U	2 UL	2 U	1.8 U	1.8 U	2 U
GAMMA-CHLORDANE	1.9 U	2 UL	2 U	1.8 U	1.8 U	2 U
HEPTACHLOR	1.9 U	2 UL	2 U	1.8 U	1.8 U	2 U
HEPTACHLOR EPOXIDE	1.9 U	2 UL	2 U	1.8 U	1.8 U	2 U

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
PESTICIDES/PCBs (µg/kg)						
METHOXYCHLOR	19 U	20 UL	20 U	18 U	18 U	20 U
TOXAPHENE	190 U	200 UL	200 U	180 U	180 U	200 U
METALS (mg/kg)						
ALUMINUM	32200	24700	24800	3670	9180	16700
ANTIMONY	0.62 UL	0.64 UL	0.67 UL	0.92 B	0.78 B	0.67 B
ARSENIC	8.6 K	6.6 K	5.6 K	1.9 B	4.8 K	4.7 K
BARIUM	33.2	63.5	66.5	17.9	32.2	56.7
BERYLLIUM	0.02 UL	0.02 UL	0.02 UL	0.02 U	0.02 U	0.02 B
CADMIUM	0.28 B	0.27 B	0.3 B	0.38 B	0.25 B	0.36 B
CALCIUM	82.5 B	1180 J	624 J	734 J	2390 J	1530 J
CHROMIUM	42.4 K	32.1 K	28.5 K	9.1 K	19.7 K	20.7 K
COBALT	3 K	6.3	6.2	1.6 B	4.7	5.1
COPPER	15.5 J	15 J	12.5 J	12.2 J	12 J	13 J
CYANIDE	0.21 U	0.28 U	0.25 U	0.25 U	0.19	0.23 U
IRON	30300	32900	29200	7200	19600	18500
LEAD	8.5 K	15.5 K	11.8 K	40.1 K	13.5 K	19.5 K
MAGNESIUM	650 K	2400	2180	399 K	699 K	1450 K
MANGANESE	24.3	121	132	71.8	115	66.5
MERCURY	0.05	0.06	0.05	0.05	0.04	0.12
NICKEL	8.2 J	13.5 J	12.9 J	3.2 J	5.5 J	9.4 J
POTASSIUM	549 K	1190 K	1050 K	183 K	405 K	759 K
SELENIUM	0.72 J	0.53 UJ	0.55 UJ	0.5 UJ	0.58 J	0.55 J
SILVER	0.2 U	0.21 U	0.22 U	0.2 U	0.19 U	0.21 U
SODIUM	120 B	116 B	112 B	52.4 B	89.2 B	130 B
THALLIUM	0.51 UJ	0.53 UJ	0.55 UJ	0.5 UJ	0.49 UJ	0.55 B

SUMMARY OF ANALYTICAL RESULTS - SURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
DEPTH (feet):	0-1'	0-1'	0-1'	0-1'	0-1'	0-1'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SS-01	28-SS-02	28-SS-03	28-SS-07	28-SS-08	28-SS-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
METALS (mg/kg)						
VANADIUM	56.9 K	48.5 K	43.6 K	12.8 K	32.8 K	32.2 K
ZINC	16.5 J	40.4 J	38.1 J	33.9 J	26.3 J	47.8 J
GENERAL CHEMISTRY ()						
PH	4.67	4.93	5.05	7.51	7.95	7.81

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-01	28-SB-02	28-SB-03	28-SB-04(2)	28-SB-04(4)	28-SB-05(2)
DEPTH (feet):				2-4'	4-6'	2-4'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/24/97	10/24/97	10/24/97
LOCATION:	28-SB-01	28-SB-02	28-SB-03	28-SB-04	28-SB-04	28-SB-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
VOLATILES (µg/kg)						
1,1,1-TRICHLOROETHANE	11 U	11 U	12 U	12 U	12 U	11 U
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	12 U	12 U	12 U	11 U
1,1,2-TRICHLOROETHANE	11 U	11 U	12 U	12 U	12 U	11 U
1,1-DICHLOROETHANE	11 U	11 U	12 U	12 U	12 U	11 U
1,1-DICHLOROETHENE	11 U	11 U	12 U	12 U	12 U	11 U
1,2-DICHLOROETHANE	11 U	11 U	12 U	12 U	12 U	11 U
1,2-DICHLOROETHENE (TOTAL)	11 U	11 U	12 U	12 U	12 U	11 U
1,2-DICHLOROPROPANE	11 U	11 U	12 U	12 U	12 U	11 U
2-BUTANONE	11 UJ	11 UJ	12 U	10 J	12 U	11 U
2-HEXANONE	11 U	11 U	12 U	12 U	12 U	11 U
4-METHYL-2-PENTANONE	11 U	11 U	12 U	12 U	12 U	11 U
ACETONE	11 U	11 U	12 U	79 J	12 U	32 J
BENZENE	11 U	11 U	12 U	12 U	12 U	11 U
BROMODICHLOROMETHANE	11 U	11 U	12 U	12 U	12 U	11 U
BROMOFORM	11 U	11 U	12 U	12 U	12 U	11 U
BROMOMETHANE	11 U	11 U	12 U	12 U	12 U	11 U
CARBON DISULFIDE	11 U	11 U	12 U	12 U	12 U	11 U
CARBON TETRACHLORIDE	11 U	11 U	12 U	12 U	12 U	11 U
CHLOROBENZENE	11 U	11 U	12 U	77	15	11 U
CHLOROETHANE	11 U	11 U	12 U	12 U	12 U	11 U
CHLOROFORM	11 U	11 U	12 U	12 U	12 U	11 U
CHLOROMETHANE	11 U	11 U	12 U	12 U	12 U	11 U
CIS-1,3-DICHLOROPROPENE	11 U	11 U	12 U	12 U	12 U	11 U
DIBROMOCHLOROMETHANE	11 U	11 U	12 U	12 U	12 U	11 U
ETHYLBENZENE	11 U	11 U	12 U	12 U	12 U	11 U

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-01	28-SB-02	28-SB-03	28-SB-04(2)	28-SB-04(4)	28-SB-05(2)
DEPTH (feet):				2-4'	4-6'	2-4'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/24/97	10/24/97	10/24/97
LOCATION:	28-SB-01	28-SB-02	28-SB-03	28-SB-04	28-SB-04	28-SB-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
VOLATILES (µg/kg)						
METHYLENE CHLORIDE	3 B	2 B	11 B	23 B	10 B	7 B
STYRENE	11 U	11 U	12 U	12 U	12 U	11 U
TETRACHLOROETHENE	11 U	11 U	12 U	12 U	12 U	11 U
TOLUENE	11 U	11 U	12 U	12 U	12 U	11 U
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	12 U	12 U	12 U	11 U
TRICHLOROETHENE	11 U	11 U	12 U	12 U	12 U	11 U
VINYL CHLORIDE	11 U	11 U	12 U	12 U	12 U	11 U
XYLENES, TOTAL	11 U	11 U	12 U	12 U	12 U	11 U
SEMIVOLATILES (µg/kg)						
1,2,4-TRICHLOROBENZENE	370 U	370 U	390 U	390 UJ	52 J	370 UJ
1,2-DICHLOROBENZENE	370 U	370 U	390 U	86 J	400 UJ	370 UJ
1,3-DICHLOROBENZENE	370 U	370 U	390 U	520 J	400 UJ	370 UJ
1,4-DICHLOROBENZENE	370 U	370 U	390 U	1000 J	49 J	370 UJ
2,2'-OXYBIS(1-CHLOROPROPANE)	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
2,4,5-TRICHLOROPHENOL	930 U	930 U	970 U	970 UJ	990 UJ	940 UJ
2,4,6-TRICHLOROPHENOL	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
2,4-DICHLOROPHENOL	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
2,4-DIMETHYLPHENOL	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
2,4-DINITROPHENOL	930 U	930 U	970 U	970 UJ	990 UJ	940 UJ
2,4-DINITROTOLUENE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
2,6-DINITROTOLUENE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
2-CHLORONAPHTHALENE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
2-CHLOROPHENOL	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
2-METHYLNAPHTHALENE	370 U	370 U	390 U	80 J	400 UJ	370 UJ
2-METHYLPHENOL	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-01	28-SB-02	28-SB-03	28-SB-04(2)	28-SB-04(4)	28-SB-05(2)
DEPTH (feet):				2-4'	4-6'	2-4'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/24/97	10/24/97	10/24/97
LOCATION:	28-SB-01	28-SB-02	28-SB-03	28-SB-04	28-SB-04	28-SB-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
SEMIVOLATILES (µg/kg)						
2-NITROANILINE	930 U	930 U	970 U	970 UJ	990 UJ	940 UJ
2-NITROPHENOL	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
3,3'-DICHLOROBENZIDINE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
3-NITROANILINE	930 U	930 U	970 U	970 UJ	990 UJ	940 UJ
4,6-DINITRO-2-METHYLPHENOL	930 UJ	930 UJ	970 UJ	970 UJ	990 UJ	940 UJ
4-BROMOPHENYL PHENYL ETHER	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
4-CHLORO-3-METHYLPHENOL	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
4-CHLOROANILINE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
4-CHLOROPHENYL PHENYL ETHER	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
4-METHYLPHENOL	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
4-NITROANILINE	930 U	930 U	970 U	970 UJ	990 UJ	940 UJ
4-NITROPHENOL	930 U	930 U	970 U	970 UJ	990 UJ	940 UJ
ACENAPHTHENE	370 U	370 U	390 U	120 J	400 UJ	370 UJ
ACENAPHTHYLENE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
ANTHRACENE	370 U	370 U	390 U	140 J	400 UJ	370 UJ
BENZO(A)ANTHRACENE	370 U	370 U	390 U	350 J	400 UJ	370 UJ
BENZO(A)PYRENE	370 U	370 U	390 U	250 J	400 UJ	370 UJ
BENZO(B)FLUORANTHENE	370 U	370 U	390 U	230 J	400 UJ	370 UJ
BENZO(G,H,I)PERYLENE	370 U	370 U	390 U	190 J	400 UJ	370 UJ
BENZO(K)FLUORANTHENE	370 U	370 U	390 U	210 J	400 UJ	370 UJ
BIS(2-CHLOROETHOXY)METHANE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
BIS(2-CHLOROETHYL)ETHER	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	86 B	370 U	40 B	390 UJ	400 UJ	370 UJ
BUTYLBENZYL PHTHALATE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
CARBAZOLE	370 U	370 U	390 U	69 J	400 UJ	370 UJ

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-01	28-SB-02	28-SB-03	28-SB-04(2)	28-SB-04(4)	28-SB-05(2)
DEPTH (feet):				2-4'	4-6'	2-4'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/24/97	10/24/97	10/24/97
LOCATION:	28-SB-01	28-SB-02	28-SB-03	28-SB-04	28-SB-04	28-SB-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
SEMIVOLATILES (µg/kg)						
CHRYSENE	370 U	370 U	390 U	340 J	400 UJ	370 UJ
DI-N-BUTYL PHTHALATE	250 J	38 J	57 J	390 UJ	400 UJ	370 UJ
DI-N-OCTYL PHTHALATE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
DIBENZO(A,H)ANTHRACENE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
DIBENZOFURAN	370 U	370 U	390 U	39 J	400 UJ	370 UJ
DIETHYL PHTHALATE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
DIMETHYL PHTHALATE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
FLUORANTHENE	370 U	370 U	390 U	730 J	400 UJ	370 UJ
FLUORENE	370 U	370 U	390 U	98 J	400 UJ	370 UJ
HEXACHLOROBENZENE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
HEXACHLOROBUTADIENE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
HEXACHLOROCYCLOPENTADIENE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
HEXACHLOROETHANE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
INDENO(1,2,3-CD)PYRENE	370 U	370 U	390 U	180 J	400 UJ	370 UJ
ISOPHORONE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
N-NITROSO-DI-N-PROPYLAMINE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
N-NITROSODIPHENYLAMINE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
NAPHTHALENE	370 U	370 U	390 U	84 J	400 UJ	370 UJ
NITROBENZENE	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
PENTACHLOROPHENOL	930 U	930 U	970 U	970 UJ	990 UJ	940 UJ
PHENANTHRENE	370 U	370 U	390 U	610 J	400 UJ	370 UJ
PHENOL	370 U	370 U	390 U	390 UJ	400 UJ	370 UJ
PYRENE	370 U	370 U	49 J	660 J	400 UJ	370 UJ
PESTICIDES/PCBs (µg/kg)						
4,4'-DDD	3.7 U	3.7 U	3.9 U	3.9 UJ	3.9 UJ	3.7 UJ

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-01	28-SB-02	28-SB-03	28-SB-04(2)	28-SB-04(4)	28-SB-05(2)
DEPTH (feet):				2-4'	4-6'	2-4'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/24/97	10/24/97	10/24/97
LOCATION:	28-SB-01	28-SB-02	28-SB-03	28-SB-04	28-SB-04	28-SB-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
PESTICIDES/PCBs (µg/kg)						
4,4'-DDE	3.7 U	3.7 U	3.9 U	3.9 UJ	3.9 UJ	3.7 UJ
4,4'-DDT	3.7 U	3.7 U	3.9 U	3.9 UJ	3.9 UJ	3.7 UJ
ALDRIN	1.8 U	1.8 U	1.9 U	1.9 UJ	2 UJ	1.9 UJ
ALPHA-BHC	1.8 U	1.8 U	1.9 U	1.9 UJ	2 UJ	1.9 UJ
ALPHA-CHLORDANE	1.8 U	1.8 U	1.9 U	1.9 UJ	2 UJ	1.9 UJ
AROCLOR-1016	37 U	37 U	39 U	39 UJ	39 UJ	37 UJ
AROCLOR-1221	74 U	74 U	77 U	78 UJ	79 UJ	75 UJ
AROCLOR-1232	37 U	37 U	39 U	39 UJ	39 UJ	37 UJ
AROCLOR-1242	37 U	37 U	39 U	39 UJ	39 UJ	37 UJ
AROCLOR-1248	37 U	37 U	1400 J	39 UJ	39 UJ	37 UJ
AROCLOR-1254	37 U	37 U	39 U	39 UJ	39 UJ	37 UJ
AROCLOR-1260	13 J	6.4 J	560 J	760 J	210 J	46 J
BETA-BHC	1.8 U	1.8 U	1.9 U	1.9 UJ	2 UJ	1.9 UJ
DELTA-BHC	1.8 U	1.8 U	1.9 U	1.9 UJ	2 UJ	1.9 UJ
DIELDRIN	3.7 U	3.7 U	3.9 U	3.9 UJ	3.9 UJ	3.7 UJ
ENDOSULFAN I	1.8 U	1.8 U	1.9 U	1.9 UJ	2 UJ	1.9 UJ
ENDOSULFAN II	3.7 U	3.7 U	3.9 U	3.9 UJ	3.9 UJ	3.7 UJ
ENDOSULFAN SULFATE	3.7 U	3.7 U	3.9 U	3.9 UJ	3.9 UJ	3.7 UJ
ENDRIN	3.7 U	3.7 U	3.9 U	3.9 UJ	3.9 UJ	3.7 UJ
ENDRIN ALDEHYDE	3.7 U	3.7 U	3.9 U	3.9 UJ	3.9 UJ	3.7 UJ
ENDRIN KETONE	3.7 U	3.7 U	3.9 U	3.9 UJ	3.9 UJ	3.7 UJ
GAMMA-BHC (LINDANE)	1.8 U	1.8 U	1.9 U	1.9 UJ	2 UJ	1.9 UJ
GAMMA-CHLORDANE	1.8 U	1.8 U	1.9 U	1.9 UJ	2 UJ	1.9 UJ
HEPTACHLOR	1.8 U	1.8 U	1.9 U	1.9 UJ	2 UJ	1.9 UJ
HEPTACHLOR EPOXIDE	1.8 U	1.8 U	1.9 U	1.9 UJ	2 UJ	1.9 UJ

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-01	28-SB-02	28-SB-03	28-SB-04(2)	28-SB-04(4)	28-SB-05(2)
DEPTH (feet):				2-4'	4-6'	2-4'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/24/97	10/24/97	10/24/97
LOCATION:	28-SB-01	28-SB-02	28-SB-03	28-SB-04	28-SB-04	28-SB-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
PESTICIDES/PCBs (µg/kg)						
METHOXYCHLOR	18 U	18 U	19 U	19 UJ	20 UJ	19 UJ
TOXAPHENE	180 U	180 U	190 U	190 UJ	200 UJ	190 UJ
METALS (mg/kg)						
ALUMINUM	17900	10900	16200	17100	16600	20900
ANTIMONY	0.61 UL	0.74 B	0.64 UL	0.65 UL	0.64 UL	0.63 UL
ARSENIC	6.9 K	2.1 B	3.4 B	3.8	2.8	5.1
BARIUM	19.2	31.1	62.9	74.1	64.7	64.4
BERYLLIUM	0.02 UL	0.02 U	0.07 B	0.02 U	0.04 B	0.02 U
CADMIUM	0.22 B	0.23 B	0.6 B	0.47 B	0.52 B	0.5 B
CALCIUM	74 B	2610 J	3030 J	1200 J	819 J	927 J
CHROMIUM	41 K	14.8 K	21.6 K	18.7 J	16.8 J	23.3 J
COBALT	1.7 B	2.4 B	4.6	5.6	7	5.6
COPPER	15 J	9.8 J	14.7 J	9.4 J	12.6 J	9.1 J
CYANIDE	0.19 U	0.26 U	0.24 U			
IRON	25500	13300	18000	16000	18400	21100
LEAD	5.8 K	10.3 K	40.7 K	17.4 J	15.1 J	10.1 J
MAGNESIUM	374 K	1110 K	1530 K	1450 J	1210 J	1670 J
MANGANESE	89.1	65.2	106	148 J	508 J	91.3 J
MERCURY	0.03	0.06	0.12	0.05	0.03	0.06
NICKEL	6.5 J	5.8 J	8.9 J	10	9.8	11.2
POTASSIUM	314 K	513 K	701 K	794 J	802 J	1170 J
SELENIUM	0.5 UJ	0.53 J	0.52 UJ	1 K	0.7 K	0.52 U
SILVER	0.2 U	0.19 U	0.2 U	0.21 U	0.21 U	0.2 U
SODIUM	82.7 B	73.5 B	89.9 B	201 B	188 B	172 B
THALLIUM	0.5 UJ	0.5 UJ	0.52 UJ	0.54 U	0.52 U	0.52 U

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-01	28-SB-02	28-SB-03	28-SB-04(2)	28-SB-04(4)	28-SB-05(2)
DEPTH (feet):				2-4'	4-6'	2-4'
SAMPLE DATE:	10/23/97	10/23/97	10/23/97	10/24/97	10/24/97	10/24/97
LOCATION:	28-SB-01	28-SB-02	28-SB-03	28-SB-04	28-SB-04	28-SB-05
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
METALS (mg/kg)						
VANADIUM	36.4 K	21.8 K	30.7 K	28.8	25.3	37.3
ZINC	10.6 J	18.6 J	58.4 J	45.8 J	33.2 J	34 J
GENERAL CHEMISTRY ()						
PH	4.83	5.21	7.49			

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-05(4)	28-SB-06(2)	28-SB-06(4)	28-SB-07	28-SB-08	28-SB-09
DEPTH (feet):	4-6'	2-4'	4-6'			
SAMPLE DATE:	10/24/97	10/24/97	10/24/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SB-05	28-SB-06	28-SB-06	28-SB-07	28-SB-08	28-SB-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
VOLATILES (µg/kg)						
1,1,1-TRICHLOROETHANE	11 U	11 U	11 U	11 U	12 U	12 U
1,1,2,2-TETRACHLOROETHANE	11 U	11 U	11 U	11 U	12 U	12 U
1,1,2-TRICHLOROETHANE	11 U	11 U	11 U	11 U	12 U	12 U
1,1-DICHLOROETHANE	11 U	11 U	11 U	11 U	12 U	12 U
1,1-DICHLOROETHENE	11 U	11 U	11 U	11 U	12 U	12 U
1,2-DICHLOROETHANE	11 U	11 U	11 U	11 U	12 U	12 U
1,2-DICHLOROETHENE (TOTAL)	11 U	11 U	11 U	11 U	12 U	12 U
1,2-DICHLOROPROPANE	11 U	11 U	11 U	11 U	12 U	12 U
2-BUTANONE	11 U	11 U	11 U	11 U	18 J	7 J
2-HEXANONE	11 U	11 U	11 U	11 U	12 U	12 U
4-METHYL-2-PENTANONE	11 U	11 U	11 U	11 U	12 U	12 U
ACETONE	11 U	11 U	11 U	11 U	120 J	69 J
BENZENE	11 U	11 U	11 U	11 U	12 U	12 U
BROMODICHLOROMETHANE	11 U	11 U	11 U	11 U	12 U	12 U
BROMOFORM	11 U	11 U	11 U	11 U	12 U	12 U
BROMOMETHANE	11 U	11 U	11 U	11 U	12 U	12 U
CARBON DISULFIDE	11 U	11 U	11 U	11 U	12 U	12 U
CARBON TETRACHLORIDE	11 U	11 U	11 U	11 U	12 U	12 U
CHLOROBENZENE	11 U	11 U	11 U	11 U	12 U	12 U
CHLOROETHANE	11 U	11 U	11 U	11 U	12 U	12 U
CHLOROFORM	11 U	11 U	11 U	11 U	12 U	12 U
CHLOROMETHANE	11 U	11 U	11 U	11 U	12 U	12 U
CIS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	12 U	12 U
DIBROMOCHLOROMETHANE	11 U	11 U	11 U	11 U	12 U	12 U
ETHYLBENZENE	11 U	11 U	11 U	11 U	12 U	12 U

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-05(4)	28-SB-06(2)	28-SB-06(4)	28-SB-07	28-SB-08	28-SB-09
DEPTH (feet):	4-6'	2-4'	4-6'			
SAMPLE DATE:	10/24/97	10/24/97	10/24/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SB-05	28-SB-06	28-SB-06	28-SB-07	28-SB-08	28-SB-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
VOLATILES (µg/kg)						
METHYLENE CHLORIDE	8 B	20 B	9 B	11 B	13 B	12 B
STYRENE	11 U	11 U	11 U	11 U	12 U	12 U
TETRACHLOROETHENE	11 U	11 U	11 U	11 U	12 U	12 U
TOLUENE	11 U	11 U	11 U	11 U	12 U	12 U
TRANS-1,3-DICHLOROPROPENE	11 U	11 U	11 U	11 U	12 U	12 U
TRICHLOROETHENE	11 U	11 U	11 U	11 U	12 U	12 U
VINYL CHLORIDE	11 U	11 U	11 U	11 U	12 U	12 U
XYLENES, TOTAL	11 U	11 U	11 U	11 U	12 U	12 U
SEMIVOLATILES (µg/kg)						
1,2,4-TRICHLOROBENZENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
1,2-DICHLOROBENZENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
1,3-DICHLOROBENZENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
1,4-DICHLOROBENZENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
2,2'-OXYBIS(1-CHLOROPROPANE)	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
2,4,5-TRICHLOROPHENOL	910 UJ	910 UJ	900 UJ	960 U	980 U	1000 U
2,4,6-TRICHLOROPHENOL	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
2,4-DICHLOROPHENOL	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
2,4-DIMETHYLPHENOL	360 UJ	360 UJ	360 UJ	380 U	190 J	400 U
2,4-DINITROPHENOL	910 UJ	910 UJ	900 UJ	960 U	980 U	1000 U
2,4-DINITROTOLUENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
2,6-DINITROTOLUENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
2-CHLORONAPHTHALENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
2-CHLOROPHENOL	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
2-METHYLNAPHTHALENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
2-METHYLPHENOL	360 UJ	360 UJ	360 UJ	380 U	170 J	400 U

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-05(4)	28-SB-06(2)	28-SB-06(4)	28-SB-07	28-SB-08	28-SB-09
DEPTH (feet):	4-6'	2-4'	4-6'			
SAMPLE DATE:	10/24/97	10/24/97	10/24/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SB-05	28-SB-06	28-SB-06	28-SB-07	28-SB-08	28-SB-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
SEMIVOLATILES (µg/kg)						
2-NITROANILINE	910 UJ	910 UJ	900 UJ	960 U	980 U	1000 U
2-NITROPHENOL	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
3,3'-DICHLOROBENZIDINE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
3-NITROANILINE	910 UJ	910 UJ	900 UJ	960 U	980 U	1000 U
4,6-DINITRO-2-METHYLPHENOL	910 UJ	910 UJ	900 UJ	960 UJ	980 UJ	1000 UJ
4-BROMOPHENYL PHENYL ETHER	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
4-CHLORO-3-METHYLPHENOL	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
4-CHLOROANILINE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
4-CHLOROPHENYL PHENYL ETHER	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
4-METHYLPHENOL	360 UJ	360 UJ	360 UJ	380 U	1600	400 U
4-NITROANILINE	910 UJ	910 UJ	900 UJ	960 U	980 U	1000 U
4-NITROPHENOL	910 UJ	910 UJ	900 UJ	960 U	980 U	1000 U
ACENAPHTHENE	360 UJ	360 UJ	360 UJ	380 U	48 J	400 U
ACENAPHTHYLENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
ANTHRACENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
BENZO(A)ANTHRACENE	360 UJ	360 UJ	360 UJ	380 U	66 J	400 U
BENZO(A)PYRENE	360 UJ	360 UJ	360 UJ	380 U	68 J	400 U
BENZO(B)FLUORANTHENE	360 UJ	360 UJ	360 UJ	380 U	64 J	400 U
BENZO(G,H,I)PERYLENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
BENZO(K)FLUORANTHENE	360 UJ	360 UJ	360 UJ	380 U	66 J	400 U
BIS(2-CHLOROETHOXY)METHANE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
BIS(2-CHLOROETHYL)ETHER	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
BIS(2-ETHYLHEXYL)PHTHALATE	360 UJ	360 UJ	72 B	380 U	46 B	400 U
BUTYLBENZYL PHTHALATE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
CARBAZOLE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-05(4)	28-SB-06(2)	28-SB-06(4)	28-SB-07	28-SB-08	28-SB-09
DEPTH (feet):	4-6'	2-4'	4-6'			
SAMPLE DATE:	10/24/97	10/24/97	10/24/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SB-05	28-SB-06	28-SB-06	28-SB-07	28-SB-08	28-SB-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
SEMIVOLATILES (µg/kg)						
CHRYSENE	360 UJ	360 UJ	360 UJ	380 U	77 J	400 U
DI-N-BUTYL PHTHALATE	360 UJ	360 UJ	360 UJ	46 J	42 J	100 J
DI-N-OCTYL PHTHALATE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
DIBENZO(A,H)ANTHRACENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
DIBENZOFURAN	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
DIETHYL PHTHALATE	360 UJ	360 UJ	360 UJ	380 U	390 U	42 J
DIMETHYL PHTHALATE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
FLUORANTHENE	360 UJ	360 UJ	360 UJ	66 J	170 J	400 U
FLUORENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
HEXACHLOROBENZENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
HEXACHLOROBUTADIENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
HEXACHLOROCYCLOPENTADIENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
HEXACHLOROETHANE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
INDENO(1,2,3-CD)PYRENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
ISOPHORONE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
N-NITROSO-DI-N-PROPYLAMINE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
N-NITROSODIPHENYLAMINE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
NAPHTHALENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
NITROBENZENE	360 UJ	360 UJ	360 UJ	380 U	390 U	400 U
PENTACHLOROPHENOL	910 UJ	910 UJ	900 UJ	960 U	980 U	1000 U
PHENANTHRENE	360 UJ	360 UJ	360 UJ	55 J	160 J	400 U
PHENOL	360 UJ	360 UJ	360 UJ	380 U	330 J	400 U
PYRENE	360 UJ	360 UJ	360 UJ	62 J	180 J	41 J
PESTICIDES/PCBs (µg/kg)						
4,4'-DDD	3.6 UJ	3.6 UJ	3.6 UJ	3.8 U	3.9 U	4 UL

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-05(4)	28-SB-06(2)	28-SB-06(4)	28-SB-07	28-SB-08	28-SB-09
DEPTH (feet):	4-6'	2-4'	4-6'			
SAMPLE DATE:	10/24/97	10/24/97	10/24/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SB-05	28-SB-06	28-SB-06	28-SB-07	28-SB-08	28-SB-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
PESTICIDES/PCBs (µg/kg)						
4,4'-DDE	3.6 UJ	3.6 UJ	3.6 UJ	3.8 U	0.71 J	4 UL
4,4'-DDT	3.6 UJ	3.6 UJ	3.6 UJ	3.8 U	3.9 U	4 UL
ALDRIN	1.8 UJ	1.8 UJ	1.8 UJ	1.9 U	2 U	2 UL
ALPHA-BHC	1.8 UJ	1.8 UJ	1.8 UJ	1.9 U	2 U	2 UL
ALPHA-CHLORDANE	1.8 UJ	1.8 UJ	1.8 UJ	1.9 U	2 U	2 UL
AROCLOR-1016	36 UJ	36 UJ	36 UJ	38 U	39 U	40 UL
AROCLOR-1221	72 UJ	73 UJ	72 UJ	76 U	79 U	80 UL
AROCLOR-1232	36 UJ	36 UJ	36 UJ	38 U	39 U	40 UL
AROCLOR-1242	36 UJ	36 UJ	36 UJ	38 U	39 U	40 UL
AROCLOR-1248	36 UJ	36 UJ	36 UJ	38 U	39 U	40 UL
AROCLOR-1254	36 UJ	36 UJ	36 UJ	38 U	39 U	40 UL
AROCLOR-1260	5.9 J	11 J	3.6 J	46	58	49 L
BETA-BHC	1.8 UJ	1.8 UJ	1.8 UJ	1.9 U	2 U	2 UL
DELTA-BHC	1.8 UJ	1.8 UJ	1.8 UJ	1.9 U	2 U	2 UL
DIELDRIN	3.6 UJ	3.6 UJ	3.6 UJ	3.8 U	3.9 U	4 UL
ENDOSULFAN I	1.8 UJ	1.8 UJ	1.8 UJ	1.9 U	2 U	2 UL
ENDOSULFAN II	3.6 UJ	3.6 UJ	3.6 UJ	3.8 U	3.9 U	4 UL
ENDOSULFAN SULFATE	3.6 UJ	3.6 UJ	3.6 UJ	3.8 U	3.9 U	4 UL
ENDRIN	3.6 UJ	3.6 UJ	3.6 UJ	3.8 U	3.9 U	4 UL
ENDRIN ALDEHYDE	3.6 UJ	3.6 UJ	3.6 UJ	3.8 U	3.9 U	4 UL
ENDRIN KETONE	3.6 UJ	3.6 UJ	3.6 UJ	3.8 U	3.9 U	4 UL
GAMMA-BHC (LINDANE)	1.8 UJ	1.8 UJ	1.8 UJ	1.9 U	2 U	2 UL
GAMMA-CHLORDANE	1.8 UJ	1.8 UJ	1.8 UJ	1.9 U	2 U	2 UL
HEPTACHLOR	1.8 UJ	1.8 UJ	1.8 UJ	1.9 U	2 U	2 UL
HEPTACHLOR EPOXIDE	1.8 UJ	1.8 UJ	1.8 UJ	1.9 U	2 U	2 UL

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-05(4)	28-SB-06(2)	28-SB-06(4)	28-SB-07	28-SB-08	28-SB-09
DEPTH (feet):	4-6'	2-4'	4-6'			
SAMPLE DATE:	10/24/97	10/24/97	10/24/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SB-05	28-SB-06	28-SB-06	28-SB-07	28-SB-08	28-SB-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
PESTICIDES/PCBs (µg/kg)						
METHOXYCHLOR	18 UJ	18 UJ	18 UJ	19 U	20 U	20 UL
TOXAPHENE	180 UJ	180 UJ	180 UJ	190 U	200 U	200 UL
METALS (mg/kg)						
ALUMINUM	12100	26200	15200	19300	16600	19900
ANTIMONY	0.61 UL	0.61 UL	0.6 UL	0.62 UL	1.4 B	0.65 UL
ARSENIC	3.6	12	6.9	4.1 K	3.9 B	5.2 K
BARIUM	24.8	26	20.8	27.6	58.2	65.8
BERYLLIUM	0.02 U	0.02 UL	0.02 U	0.02 U	0.02 U	0.02 U
CADMIUM	0.49 B	0.71 B	0.43 B	0.18 B	0.3 B	0.3 B
CALCIUM	1890 J	95.5 B	162 B	326 J	1190 J	1180 J
CHROMIUM	20.2 J	73.6 J	36.6 J	27.2 K	20.5 K	23.5 K
COBALT	1.8 B	2.4 B	1.4 B	1.9 B	5.7	5.6
COPPER	11.6 J	19.5 J	11 J	10.9 J	11 J	11.7 J
CYANIDE				0.25 U	0.23	0.28 U
IRON	14200	36400	19000	21000	21700	21400
LEAD	7.3 J	8.3 J	7 J	7.3 K	24.7 K	24.3 K
MAGNESIUM	709 J	541 J	374 J	603 K	1340 K	1610 K
MANGANESE	41.3 J	18.3 J	12.8 J	27.2	150	63.7
MERCURY	0.05	0.03	0.02 U	0.03	0.06	0.07
NICKEL	4.6	6.6	3.6 B	5.1 J	8.8 J	9.8 J
POTASSIUM	501 J	503 J	411 J	478 K	754 K	880 K
SELENIUM	0.5 U	2.6 L	0.91 K	1 J	0.74 J	0.73 J
SILVER	0.19 U	0.28 B	0.19 U	0.2 U	0.21 U	0.21 U
SODIUM	168 B	111 B	100 B	56.7 B	91.3 B	118 B
THALLIUM	0.5 U	1.4 B	0.49 U	0.51 UJ	0.53 UJ	0.53 UJ

SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL
SITE 28 - BUILDING T-14 SCRAP YARD
NSWC WHITE OAK

SAMPLE NUMBER:	28-SB-05(4)	28-SB-06(2)	28-SB-06(4)	28-SB-07	28-SB-08	28-SB-09
DEPTH (feet):	4-6'	2-4'	4-6'			
SAMPLE DATE:	10/24/97	10/24/97	10/24/97	10/23/97	10/23/97	10/23/97
LOCATION:	28-SB-05	28-SB-06	28-SB-06	28-SB-07	28-SB-08	28-SB-09
SAMPLE TYPE:	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
FIELD DUPLICATE OF:						
METALS (mg/kg)						
VANADIUM	25.8	61.2	39.8	38.1 K	31.8 K	37.5 K
ZINC	14.8 J	13.3 J	9.2 J	11.7 J	55.5 J	52 J
GENERAL CHEMISTRY ()						
PH				5.09	6.8	6.98

Quality Assurance Project Plan for Field Sampling Site 1 and Site 28

former

Naval Surface Warfare Center White Oak

Silver Spring, Maryland

Engineering Field Activity Chesapeake
Naval Facilities Engineering Command

Contract Number N62472-90-D-1298

Contract Task Order 0315

March 1999

099809/P

QUALITY ASSURANCE PROJECT PLAN
FOR FIELD SAMPLING
SITE 1 AND SITE 28

FORMER
NAVAL SURFACE WARFARE CENTER, WHITE OAK
SILVER SPRING, MARYLAND

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Engineering Field Activity Chesapeake
Environmental Branch Code 18
Naval Facilities Engineering Command
Washington Navy Yard, Building 212
Washington, D.C. 20374-2121

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TABLE OF CONTENTS

SECTION		PAGE NO.
ACRONYMS/ABBREVIATIONS		iv
1.0	PROJECT DESCRIPTION	1-1
1.1	INTRODUCTION	1-1
1.2	FACILITY DESCRIPTION	1-1
1.3	PROJECT OBJECTIVES	1-1
1.3.1	Overall Project Objective	1-2
1.3.2	Project Target Parameters and Intended Data Uses	1-2
1.4	SAMPLE NETWORK DESIGN AND RATIONALE	1-4
2.0	PROJECT ORGANIZATION	2-1
3.0	QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA	3-1
4.0	SAMPLING PROCEDURES	4-1
5.0	CUSTODY PROCEDURES	5-1
6.0	CALIBRATION PROCEDURES AND FREQUENCY	6-1
7.0	ANALYTICAL AND MEASUREMENT PROCEDURES	7-1
8.0	QUALITY CONTROL CHECKS	8-1
9.0	DATA REDUCTION, VALIDATION, AND REPORTING	9-1
9.1	DATA REDUCTION	9-1
9.1.1	Field Data Reduction	9-1
9.1.2	Laboratory Data Reduction	9-1
9.2	DATA VALIDATION	9-2
9.2.1	Field Measurement Data Validation	9-2
9.2.2	Laboratory Data Validation	9-2
9.3	DATA REPORTING	9-2
10.0	PERFORMANCE AND SYSTEM AUDITS	10-1
11.0	PREVENTIVE MAINTENANCE PROCEDURES	11-1
12.0	SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS	12-1
13.0	CORRECTIVE ACTION	13-1
14.0	QUALITY ASSURANCE REPORTS TO MANAGEMENT	14-1
REFERENCES		R-1

TABLES

NUMBER		PAGE NO.
1-1	Summary of Organic and Inorganic Analytical Procedures - Aqueous Matrices	1-3

FIGURES

NUMBER		PAGE NO.
2-1	Project Organization Chart	2-2

ACRONYMS/ABBREVIATIONS

ASTM	American Society for Testing and Materials
B&R	Brown & Root
BRAC	Base Realignment and Closure
CLEAN	Comprehensive Long-term Environmental Action Navy
CTO	Contract Task Order
EE/CA	Engineering Evaluation/ Cost Analysis
EFACHES	Engineering Field Activity Chesapeake
FID	Flame Ionization Detector
FSP	Field Sampling Plan
HASP	Health and Safety Plan
IDW	Investigation Derived Waste
IRP	Installation Restoration Program
MDE	Maryland Department of the Environment
NFESC	Naval Facilities Engineering Service Center
NSWC	Naval Surface Warfare Center
PID	Photoionization Detector
PQL	Practical Quantitation Limit
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
SOP	Standard Operating Procedure
SVOC	Semivolatile Organic Compounds
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOC	Total Organic Carbon
TtNUS	Tetra Tech NUS
USEPA	United State Environmental Protection Agency
VOC	Volatile Organic Compounds

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared by Tetra Tech NUS (TtNUS), formerly Brown & Root Environmental, on behalf of the United States Navy Northern Division Naval Facilities Engineering Command and the former Naval Surface Warfare Center (NSWC) White Oak, Silver Spring, Maryland, under the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62472-90-D-1298, Contract Task Order (CTO) 0315.

This QAPP is intended to be used in conjunction with the project-specific Field Sampling Plan (FSP) and Health and Safety Plan (HASP) submitted herewith, as well as the existing Master project planning documents (Master QAPP, Master Work Plan, Master FSP, and Master HASP) for NSWC-White Oak (B&R Environmental, 1998).

This QAPP presents the organization, objectives, planned activities, and specific Quality Assurance/Quality Control (QA/QC) procedures associated with the field investigation to be performed at Sites 1 and 28 at the former NSWC-White Oak facility. Specific protocols for sampling, sample handling and storage, chain-of-custody, and laboratory and field analyses are described. All QA/QC procedures are structured in accordance with applicable technical standards, the Naval Facilities Engineering Service Center (NFESC) guidance document "Navy Installation Restoration Laboratory Quality Assurance Guide" (NFESC 1996), and United States Environmental Protection Agency (USEPA) Region III and Maryland Department of the Environment (MDE) requirements, regulations, guidance, and technical standards.

1.2 FACILITY DESCRIPTION

A description of the former NSWC-White Oak facility, including its location, size and borders, site condition, and natural and manmade features, is provided in Sections 1.1 and 1.2 of the CTO 0315 FSP (TtNUS, 1998).

1.3 PROJECT OBJECTIVES

This section discusses the overall project objectives and the target parameters and intended data uses for both field and laboratory analytical data.

1.3.1 Overall Project Objective

The primary objective of the field investigation is to obtain information as to the extent, type, and levels of contamination present at Sites 1 and 28 at the former NSWC-White Oak facility. These data will be used to develop an Engineering Evaluation/Cost Analysis Report which will address the mitigation of site risks present at each site.

1.3.2 Project Target Parameters and Intended Data Uses

This section discusses the field and laboratory analytical information to be generated during the course of the investigation. Field parameters and intended data uses are discussed in Section 1.3.2.1. Laboratory parameters and intended data uses are discussed in Section 1.3.2.2.

1.3.2.1 Field Parameters

Field parameters will include those associated with soil sampling and analysis. Field measurements will include only those completed using simple field instrumentation.

Field measurements of total volatile organics will be completed using a Photoionization Detector (PID) or Flame Ionization Detector (FID). These measurements will be used to monitor breathing zone conditions of site workers, to locate potential source areas using soil gas screening, and to screen for high concentrations of contaminants in order to alert the laboratory.

1.3.2.2 Laboratory Parameters

The analytical methods to be used for sample analysis at the former NSWC-White Oak facility have been selected based on existing information regarding the use of the facility. The suite of analyses for the field investigation activities include Target Compound List (TCL) volatile organic compounds (VOCs); TCL semivolatile organic compounds (SVOCs); TCL Pesticides and Polychlorinated Biphenyls (Pest/PCB); Target Analyte List (TAL) metals; explosives; and toxicity characteristic leaching procedure (TCLP) metals, VOCs, SVOCs, pesticides and herbicides. Data generated from these analyses will be used to determine the nature and extent of contamination in soils at Sites 1 and 28.

Tables 1-1 lists the specific analytical methods to be used for the analysis of soil samples collected during this investigation. Analytical detection limits for TCL organic and TAL inorganic analyses are provided in

TABLE 1-1

SUMMARY OF ORGANIC AND INORGANIC ANALYTICAL PROCEDURES
SOLID MATRICES
NSWC-WHITE OAK, SILVER SPRING, MARYLAND

Parameter	Solid Samples	
	Preparation Method	Analytical Method
TCL Volatile Organics	OLM03.2[1]	OLM03.2
TCL Semivolatile Organics	OLM03.2	OLM03.2
TCL Pesticides/PCBs	OLM03.2	OLM03.2
TAL Metals	ILM04.0[2]	ILM04.0
Explosives	SW-846 8330	SW-846 8330
Full-Regulatory List TCLP	SW-846 1311[3]	SW-846 1311[3]

1 USEPA, 1994.
2 USEPA, 1995.
3 TCLP Extraction followed by analysis of the extracts for volatile organics by USEPA SW-846 Method 8260B, for semivolatile organics by SW-846 Method 8270B, for pesticides by SW-846 Method 8081A, for herbicides by SW-846 Method 8151A, and for metals by SW-846 Methods 6010B and 7470 (mercury).

TCL Target Compound List
TAL Target Analyte List
TCLP Toxicity Characteristic Leaching Procedure

Tables 1-2 and 1-4 of the Master QAPP. Detection limits for explosives are presented in Table 1-9 of the Master QAPP. Analytical methods are further discussed in Section 7.0 of the Master QAPP. Section 3.1.2 of the Master Work Plan discusses the Toxicity Characteristic Leaching Procedure (TCLP), and Table 3-2 of the Master Work Plan lists the TCLP constituents and regulatory levels for each TCLP constituent.

1.4 SAMPLE NETWORK DESIGN AND RATIONALE

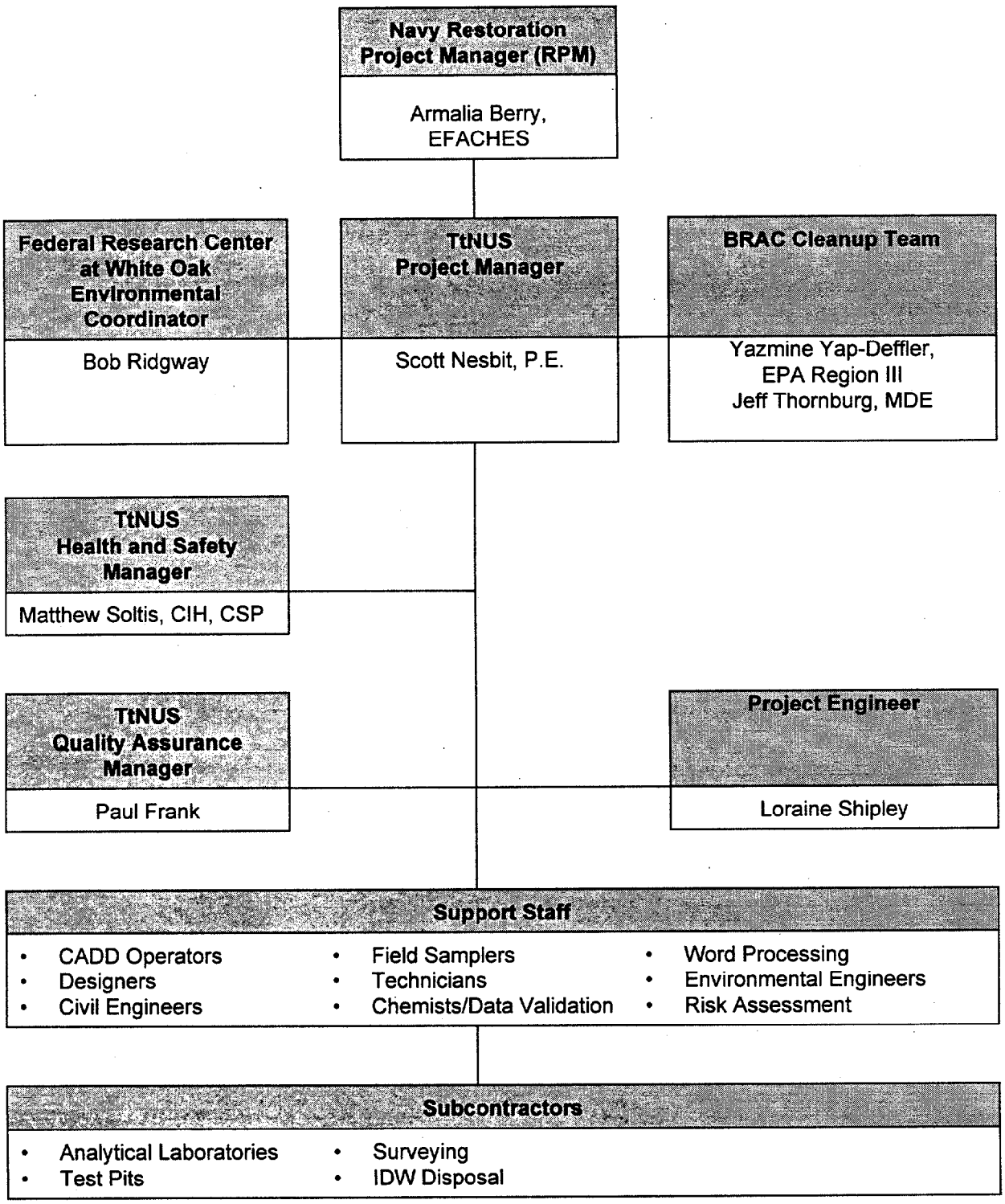
The sample network design and rationale is discussed in detail in Section 2.0 of the CTO 315 FSP. Figures displaying proposed sampling locations are provided therein.

2.0 PROJECT ORGANIZATION

The project organization chart for the Site Screening is provided in Figure 2-1. Further information regarding project organization is provided in Section 2.0 of the Master QAPP.

FIGURE 2-1

PROJECT ORGANIZATION CHART
NSWC-WHITE OAK, SILVER SPRING, MARYLAND



3.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

See Section 3.0 of the Master QAPP.

4.0 SAMPLING PROCEDURES

Field sampling procedures for the former NSWC-White Oak facility are discussed in detail in Section 3.1 of the Master FSP. In addition, the CTO 0315 FSP addresses the following sampling procedures and field investigation tasks:

Mobilization/demobilization - Section 3.1
Test pit excavation/soil sampling - Section 3.2
Soil Sampling – Section 3.3
Sample handling - Section 3.4
Sample custody - Section 3.5
Investigation-derived waste (IDW) - Section 3.8
Equipment calibration - Section 3.7
Field survey - Section 3.9

Standard Operating Procedures (SOPs) regarding sampling, record keeping, and field investigation tasks are included in Appendices to the Master FSP.

Sample container, preservation, volume and holding time requirements specific to this investigation are provided in Table 3-3 of the CTO 0315 FSP.

5.0 CUSTODY PROCEDURES

See Section 5.0 of the Master QAPP.

6.0 CALIBRATION PROCEDURES AND FREQUENCY

See Section 6.0 of the Master QAPP.

7.0 ANALYTICAL AND MEASUREMENT PROCEDURES

See Section 7.0 of the Master QAPP.

8.0 QUALITY CONTROL CHECKS

See Section 8.0 of the Master QAPP.

9.0 DATA REDUCTION, VALIDATION, AND REPORTING

This section describes the procedures to be used for data reduction, validation, and reporting for the investigation of the former NSWC-White Oak facility. All data generated during the course of the investigation will be maintained in hardcopy form by TtNUS in the Naval Facilities Engineering Command Northern Division central files located in Pittsburgh, Pennsylvania.

In addition to the central files, photocopies of all hardcopy data (as well as electronic data) will be maintained in the Chemistry/Toxicology/Risk Assessment Department database records files located in Pittsburgh. Upon completion of the contract, all files will be relinquished to the United States Navy.

9.1 DATA REDUCTION

Data reduction will be completed for both field measurements and laboratory-generated analytical data. Field data reduction will be relatively limited versus the degree of laboratory data reduction required for the project. Reduction of both field data and laboratory data are discussed in the remainder of this section.

9.1.1 Field Data Reduction

See Section 9.1.1 of the Master QAPP.

9.1.2 Laboratory Data Reduction

Laboratory analytical data will be reported using standard concentration units to ensure comparability with regulatory standards/guidelines and previous analytical results. Reporting units for solid and aqueous matrices for the classes of chemicals under consideration are as follows:

Soil sample leachates:

- TCLP volatiles, semivolatiles, pesticides, and herbicides - mg/L
- TCLP metals - mg/L

Soil samples:

- TCL volatiles, semivolatiles, and pesticide/PCB - µg/kg
- Explosives - µg/kg
- TAL metals - mg/kg

For further information regarding laboratory data reduction refer to Section 9.1.2 of the Master QAPP.

9.2 DATA VALIDATION

Validation of field measurements and laboratory analytical data are discussed in this section. Validation of field data will be limited to real time "reality" checks whereas laboratory analytical data will be validated in accordance with current U.S. EPA guidance. Validation of field measurements is discussed in Section 9.2.1 of the Master QAPP. Validation of laboratory analytical data is discussed in Section 9.2.2 of the Master QAPP.

9.2.1 Field Measurement Data Validation

Field measurements will not be subjected to a formal data validation process. However, field technicians will ensure that the equipment used for field measurement is performing accurately via compliance with SOPs included in Appendix B of the Master FSP. All field data entered into the electronic database will be independently reviewed for transcription errors.

9.2.2 Laboratory Data Validation

All laboratory data will be validated. Validation of analytical data will be completed by the TtNUS Chemistry Department located in the TtNUS Pittsburgh office. Final review and approval of validation deliverables will be completed by the Department's Data Validation Coordinator. For further information refer to Section 9.2.2 of the Master QAPP.

9.3 DATA REPORTING

Refer to Section 9.3 of the Master QAPP.

10.0 PERFORMANCE AND SYSTEM AUDITS

See Section 10.0 of the Master QAPP.

11.0 PREVENTIVE MAINTENANCE PROCEDURES

See Section 11.0 of the Master QAPP.

12.0 SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

See Section 12.0 of the Master QAPP.

13.0 CORRECTIVE ACTION

See Section 13.0 of the Master QAPP.

14.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT

See Section 14.0 of the Master QAPP.

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Health and Safety Plan
Engineering Evaluation/Cost Analysis
for
Site 1 and Site 28

former
Naval Surface Warfare Center
White Oak
Silver Spring, Maryland

Engineering Field Activity Chesapeake
Naval Facilities Engineering Command
Contract Number N62472-90-D-1298
Contract Task Order 0315

March 1999

HEALTH AND SAFETY PLAN
ENGINEERING EVALUATION/COST ANALYSIS
WORK PLANS
FOR
SITE 1 AND SITE 28

FORMER

NAVAL SURFACE WARFARE CENTER, WHITE OAK
SILVER SPRING, MARYLAND

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Engineering Field Activity Chesapeake
Environmental Branch Code 18
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Washington Navy Yard, Building 212
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CONTRACT TASK ORDER 0315

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TABLE OF CONTENTS

Section		Page No.
1.0	**INTRODUCTION**	**1-1**
1.1	KEY PROJECT PERSONNEL AND ORGANIZATION	1-3
1.2	SITE INFORMATION AND PERSONNEL ASSIGNMENTS	1-5
2.0	**EMERGENCY ACTION PLAN**	**2-1**
2.1	INTRODUCTION	2-1
2.2	PRE-EMERGENCY PLANING	2-2
2.3	EMERGENCY RECOGNITION AND PREVENTION	2-2
2.3.1	Recognition and Prevention	2-2
2.4	SAFE DISTANCES AND PLACES OF REFUGE	2-3
2.4.1	Critical Operations	2-3
2.5	EVACUATION ROUTES AND PROCEDURES	2-3
2.6	DECONTAMINATION PROCEDURES/EMERGENCY MEDICAL TREATMENT	2-4
2.7	EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES	2-4
2.8	PPE AND EMERGENCY EQUIPMENT	2-4
2.9	EMERGENCY CONTACTS	2-7
2.10	INJURY AND ILLNESS REPORTING	2-7
2.11	EMERGENCY ROUTE TO HOSPITAL	2-9
3.0	**SITE BACKGROUND**	**3-1**
3.1	SITE DESCRIPTION/HISTORY	3-1
3.1.2	Site 1 – Parking Lot Landfill	3-2
3.1.1	Site 28 – Building T-14 Scrap-yard	3-2
4.0	**SCOPE OF WORK**	**4-1**
5.0	**TASKS/HAZARDS/ASSOCIATED CONTROL MEASURERS SUMMARIZATION**	**5-1**
6.0	**HAZARD ASSESSMENT**	**6-1**
6.1	CHEMICAL HAZARDS	6-1
6.2	PHYSICAL HAZARDS	6-2
6.3	NATURAL HAZARDS	6-2
6.3.1	Insect Bites and Stings	6-2
6.3.2	Vector Transmitted Illnesses and Diseases	6-9
6.3.3	Snakes and Other Wild Animals	6-9
6.3.4	Poisonous Plants	6-10
7.0	**TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS**	**7-1**
7.1	INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING	7-1
7.1.1	Requirements for All Field Personnel	7-1
7.2	PROJECT SPECIFIC TRAINING	7-3
7.3	MEDICAL SURVEILLANCE	7-3
7.3.1	Medical Surveillance Requirements for TtNUS and Subcontractor Personnel	7-3
7.3.2	Requirements for All Field Personnel	7-4
7.4	SUBCONTRACTOR EXCEPTION	7-4

TABLE OF CONTENTS

Section		Page No.
8.0	**SPILL CONTAINMENT PROGRAM**	**8-1**
8.1	SCOPE AND APPLICATION	8-1
8.2	POTENTIAL SPILL AREAS	8-1
8.2.1	Site Drums/Containers	8-2
8.3	LEAK AND SPILL DETECTION	8-2
8-4	PERSONNEL TRAINING AND SPILL PREVENTION	8-3
8.5	SPILL PREVENTION AND CONTAINMENT EQUIPMENT	8-3
8.6	SPILL CONTROL PLAN	8-3
9.0	**SITE CONTROL**	**9-1**
9.1	EXCLUSION ZONE	9-1
9.1.1	-Exclusion Zone Clearance	9-2
9.2	CONTAMINATION REDUCTION ZONE	9-2
9.3	SUPPORT ZONE	9-2
9.4	SITE VISITORS	9-2
9.5	SITE SECURITY	9-3
9.6	SITE MAP	9-4
9.7	BUDDY SYSTEM	9-4
9.8	MATERIAL SAFETY DATA SHEETS (MSDS) REQUIREMENTS	9-4
9.9	COMMUNICATION	9-4
9.10	SAFE WORK PERMITS	9-4
10.0	**CONFINED SPACE ENTRY**	**10-1**
11.0	**MATERIALS AND DOCUMENTATION**	**11-1**
11.1	MATERIALS TO BE POSTED AT THE SITE	11-1

TABLES

Table		Page No.
2-1	Emergency Contacts	2-8
4-1	Site-Specific Activities	4-1
5-1	Tasks/Hazards/Associated Control Measurers Summarization	5-3
6-1	Chemical, Physical, and Toxicological Data	6-3

FIGURE

Figure		Page No.
1-1	Site Vicinity Map	1-2
2-1	Emergency Response Protocol	2-5
3-1	Parking Lot Landfill Site Plan	3-4
3-2	Site Layout and Tag Map	3-5
3-3	Site Layout and Tag Map	3-6
7-1	Training Letter	7-2
7-2	Site-Specific Training Documentation	7-5
7-3	Subcontractor medical Approval Form	7-6
7-4	Medical Surveillance Letter	7-8

1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been developed to provide the minimum safety and health practices and procedures for Tetra Tech NUS, Inc. (TtNUS) and subcontractor personnel engaged in investigatory activities at the former Naval Surface Warfare Center - White Oak (NSWC White Oak), Silver Spring, Maryland (see Figure 1-1).

The following general investigatory activities will be conducted at NSWC White Oak:

- Multi-media sampling, including surface and subsurface soil sampling. This sampling will be accomplished by hand (hand augering and direct acquisition), and through test pit excavations.

- Test pit excavations will be performed to delineate the boundaries of the landfill. Some of the test pit excavations will require asphalt coverings to be removed to gain access to the soils beneath.

This HASP discusses personnel responsibilities and establishes requirements to be incorporated into the above planned activities for the purpose of protecting personnel from hazards which may be inherent to the site or task associated with the scope of work.

The TtNUS Health and Safety Guidance Manual supports this HASP. The Guidance Manual provides detailed information pertaining to the HASP, as well as applicable Standard Operating Procedures (SOPs). This HASP and the contents of the Guidance Manual were developed to comply with the requirements stipulated in 29 CFR 1910.120 (OSHA's Hazardous Waste Operations and Emergency Response Standard) and applicable portions of 29 CFR 1926 (OSHA's Construction Industry Standards), as they may apply. In order to be in compliance with the above standards, both of these documents must be present at the site during the performance of all site activities.

This HASP has been developed using the latest available information regarding known or suspected chemical contaminants and potential physical hazards associated with the proposed work at the site. This HASP will be modified if new information becomes available. All changes to the HASP will be made with the approval of the TtNUS CLEAN Health and Safety Manager (HSM). All changes made will be communicated to the Project Manager (PM), who will notify all affected personnel of changes.

FIGURE 1-1

SITE VICINITY MAP

1.1 KEY PROJECT PERSONNEL AND ORGANIZATION

This section defines responsibility for site safety and health for TtNUS and subcontractor employees engaged in on-site activities. Personnel assigned to these positions will exercise the primary responsibility for all on-site health and safety. These persons will be the primary point of contact for any questions regarding the safety and health procedures and the selected control measures that are to be implemented for on-site activities.

- The TtNUS PM is responsible for the overall direction of health and safety for this project.

- The PHSO is responsible for developing this HASP in accordance with applicable OSHA regulations. Specific responsibilities include:

  - Providing information regarding site contaminants and physical hazards associated with the site.
  - Establishing air monitoring and decontamination procedures.
  - Assigning personal protective equipment.
  - Determining emergency response procedures and emergency contacts.
  - Stipulating training requirements and reviewing appropriate training and medical surveillance certificates.
  - Providing standard work practices to minimize potential injuries and exposures associated with hazardous waste work.
  - Making any changes to this document as it may apply to site conditions or task s to be conducted.

- The TtNUS Field Operations Leader (FOL) is responsible for implementation of the HASP with the assistance of an appointed SSO. The FOL manages field activities, executes the work plan, and enforces safety procedures as applicable to the work plan.

- The SSO supports site activities by advising the FOL on all aspects of health and safety on-site. These duties may include:

  - Coordinates all health and safety activities with the FOL.
  - Selects, applies, inspects, and maintains personal protective equipment.
  - Establishes work zones and control points.
  - Implements air monitoring program for on-site activities.
  - Verifies training and medical clearance of on-site personnel status in relation to site activities.
  - Implements Hazard Communication and Respiratory Protection and other associated safety and health programs, as they may apply to the operations identified as part of this project.

- Coordinates emergency services.
- Provides site-specific training for all on-site personnel.

Compliance with the requirements stipulated in this HASP is monitored by the SSO and coordinated through the TtNUS CLEAN HSM.

1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

Site Name: Former Naval Surface Warfare Center - White Oak
Silver Springs, Maryland

Facility Contact: Robert Ridgway

Phone Number: (301) 344-8120

Project Team:

TtNUS Personnel:	Discipline/Tasks Assigned:	Phone Number:
Scott Nesbit, P.E.	Project Manager (PM)	(412) 921-7134
TBD	Field Operations Leader (FOL)	
TBD	Site Safety Officer (SSO)	
Matthew M. Soltis, CIH, CSP	CLEAN Health and Safety Manager(HSM)	(412) 921-8912
Tom Dickson, ASP	Project Health and Safety Officer (PHSO)	(412) 921-8457

Other Potential TtNUS Project personnel:	Affiliation/Discipline/Tasks Assigned:	Phone Number
TBD	Field Geologist	
Tom Patton	Equipment Manager	(412) 262-4583

Non-TtNUS Personnel:	Affiliation/Discipline/Tasks Assigned:	Phone Number
TBD	Excavation Subcontractor (Supervisor)	
TBD	Analytical Laboratory (Point of Contact)	
FedEx	Parcel Shipment	1(800)463-3339

Prepared by: Thomas Dickson, ASP

2.0 EMERGENCY ACTION PLAN

2.1 INTRODUCTION

This section has been developed as part of a preplanning effort to direct and guide field personnel in the event of an emergency. In the event of an emergency, which cannot be handled using on-site resources, personnel will evacuate to a safe place of refuge and the appropriate emergency response agencies will be notified.

An emergency may be considered to be an event including, but not limited to, fire/explosion; spill/release of hazardous materials; or injury/illness to members of the field crew on site. The severity of the event will define whether the situation is an emergency or not. If the field crew within the immediate area can effectively control the situation through their level of training or preparedness without causing additional or undue hazard to members of the field crew, this situation would not be considered an emergency. If however, outside assistance is needed to control the event, then it would be considered an emergency.

It has been determined that a majority of potential emergency situations would be better supported by outside emergency responders. Based on this determination, TtNUS and subcontractor personnel will not provide emergency response support beyond the capabilities of on-site response. Workers who are ill or who have suffered a non-serious injury may be transported by site personnel to nearby medical facilities, provided that such transport does not aggravate or further endanger the welfare of the injured/ill person. The emergency response agencies listed in this plan are capable of providing the most effective response, and as such, will be designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time. General Services Administration (GSA) Physical Security in Washington, D.C. will be notified anytime outside response agencies are summoned. This Emergency Action Plan conforms to the requirements of 29 CFR 1910.38(a), as allowed in 29 CFR 1910.120(l)(1)(ii).

TtNUS will provide the following response measures:

- Initial stage fire fighting support and prevention
- Initial spill control and containment measures and prevention
- Removal of personnel from emergency situations
- Initial medical support for injuries or illnesses requiring only first-aid level support
- Site control and security measures as necessary

2.2 PRE-EMERGENCY PLANNING

Through the initial hazard/risk assessment efforts, injuries or illnesses resulting from exposure to chemical, biological, or physical hazards are the most probable emergencies that could be encountered during site activities. To minimize and eliminate these potential emergency situations, pre-emergency planning activities associated with this project include the following (which are the responsibility of the SSO and/or the FOL):

- Coordinating with local Emergency Response personnel to ensure that TtNUS emergency action activities are compatible with existing emergency response procedures.

- Site surveying and preparation of investigation areas prior to sending equipment and personnel in to initiate proposed activities. In this manner potential physical hazards can be identified, blocked or barricaded, or removed prior to exposing field personnel.

- Conduct periodic site safety surveys of work activities with assistance from the appropriate subcontractor supervisory representative to identify potential hazards and emergency situations.

- Establishing and maintaining information at the project staging area (support zone) for easy access in the event of an emergency. This information will include the following:
  - Chemical Inventory (used on-site), with Material Safety Data Sheets.
  - On-site personnel medical records (Medical Data Sheets).
  - A logbook identifying personnel on site each day.

It will be the responsibility of the TtNUS FOL to:

- Identify a chain of command for emergency action.
- Educate site workers to the hazards and control measures associated with planned activities at the site, and to provide early recognition and prevention where possible.

2.3 EMERGENCY RECOGNITION AND PREVENTION

2.3.1 Recognition and Prevention

Because of the nature of the planned work activities, there is some potential for emergency situations to develop during site activities. Chemical, physical, biological hazards, which may be encountered under normal operations, have been addressed on the Safe Work Permit. Emergency situations that are beyond an incipient stage will be handled by outside emergency services.

TtNUS and subcontractor personnel will minimize the potential for emergencies by ensuring compliance with the HASP, Safe Work Permits, the Health and Safety Guidance Manual, applicable OSHA regulations, and by following directions given by those persons responsible for the health, and safety of the field crews. Additionally, as stated above, early recognition and prevention will be supported by initial and periodic site surveys to identify and address situations, which could create an emergency. The FOL, SSO, and subcontractor supervisory personnel will constitute the site evaluation team responsible for these periodic surveys. Periodic site surveys will be conducted at least once a week during the initiation of this effort.

2.4 SAFE DISTANCES AND PLACES OF REFUGE

In the event of an emergency, all personnel will immediately stop activities and report to a safe place of refuge outside of the exclusion zone in the support zone area identified by the SSO and communicated to the field team. The FOL or the SSO will take a head count at that location to confirm the presence of all site personnel. The site logbook will be used to take the head count. Emergency response agencies will be notified of any personnel who are unaccounted for.

2.4.1 Critical Operations

Based on the current scope of work it is not anticipated that any operations will be deemed critical requiring personnel to remain on-site during an emergency situation. Should this change, this HASP will be modified accordingly to reflect the operation to be manned and the additional protective measures to be installed for the individual who would need to remain with the identified critical operation.

2.5 EVACUATION ROUTES AND PROCEDURES

Once an evacuation is initiated, personnel will terminate site activities and proceed immediately to the designated place of refuge.

Evacuation routes from the site are dependent upon the location at which work is being performed and the circumstances under which an evacuation is required. Additionally, site location and meteorological conditions (i.e., wind speed and direction) will influence the designation of evacuation routes. As a result, assembly points will be selected, and will be proceeded to by field personnel in the event of an emergency by the most direct route possible without further endangering themselves.

2.6 DECONTAMINATION PROCEDURES/EMERGENCY MEDICAL TREATMENT

During any site evacuation, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of site workers. Decontamination will not be performed if the incident warrants immediate evacuation. However, it is unlikely that an evacuation would occur which would require workers to evacuate the site without first performing the necessary decontamination procedures.

TtNUS personnel will perform removal of personnel from emergency situations and may provide initial medical support for injury/illnesses requiring only first-aid level support. Medical attention above that level will require assistance and support from the designated emergency response agencies. **If the emergency involves personnel exposures to chemicals, follow the procedures provided in Figure 2-1.**

2.7 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES

Since TtNUS personnel may not always be working in close proximity to each other, hand signals, voice commands, air horns, and/or two-way radios will comprise the mechanisms to alert site personnel of an emergency.

If an incident occurs, site personnel will initiate the following procedures:

- Initiate incident alerting procedures (if needed) to the field team verbally, by air horn, or using two-way radios.
- Evacuate to the designated refuge location.
- Describe to the FOL (who will serve as the Incident Coordinator) what has occurred and as many details as possible. Once all personnel are evacuated, incipient response procedures will be enacted to control the situation.
- If the FOL and/or the SSO determine that the situation is beyond the capabilities of the site personnel, emergency services will be contacted using the emergency reference information listed in Table 2-1. Explain the situation and the appropriate emergency services will be dispatched. **Stay on the phone. Follow the instructions of the emergency dispatcher.**

2.8 PPE AND EMERGENCY EQUIPMENT

A first-aid kit and fire extinguishers will be maintained on site and shall be immediately available for use in the event of an incident. The PPE used in support of everyday activities will serve as the first line of defense in an emergency. This PPE will be required in all work areas of the site and will be accessible to authorized personnel.

FIGURE 2-1
EMERGENCY RESPONSE PROTOCOL

The purpose of this protocol is to provide guidance for the medical management of exposure situations.

In the event of a personnel exposure to a hazardous substance or agent:

- Rescue, when necessary, employing proper equipment and methods.
- Give attention to emergency health problems -- breathing, cardiac function, bleeding, shock.
- Transfer the victim to the medical facility designated in the HASP by suitable and appropriate conveyance (i.e. ambulance for serious events)
- Obtain as much exposure history as possible (a Potential Exposure report is attached).
- If the exposed person is a Tetra Tech NUS employee, call the medical facility and advise them that the patient(s) is/are being sent and that they can anticipate a call from the Continuum Healthcare physician. Continuum Healthcare will contact the medical facility and request specific testing which may be appropriate. The care of the victim will be monitored by Continuum Healthcare physicians. Site officers and personnel should not attempt to get this information, as this activity leads to confusion and misunderstanding.
- Call Continuum Healthcare at 1-800-229-3674, being prepared to provide:
  - Any known information about the nature of the exposure.
  - As much of the exposure history as was feasible to determine in the time allowed.
  - Name and phone number of the medical facility to which the victim(s) has/have been taken.
  - Name(s) of the exposed Tetra Tech NUS, Inc. employee(s).
  - Name and phone number of an informed site officer who will be responsible for further investigations.
  - Fax appropriate MSDS to Continuum Healthcare at (770) 457-1429.
- Contact Corporate Health and Safety Department (Matt Soltis) at 1-800-245-2730.

  As environmental data is gathered and the exposure scenario becomes more clearly defined, this information should be forwarded to the Continuum Healthcare Medical Director or Assistant Medical Director.

  Continuum Healthcare will compile the results of all data and provide a summary report of the incident. A copy of this report should be placed in each victim's medical file in addition to being distributed to appropriately designated company officials.

  Each involved worker will receive a letter describing the incident but deleting any personal or individual comments. This generalized summary will be accompanied by a personalized letter describing the individual's findings/results. A copy of the personal letter will be filed in the continuing medical file maintained by Continuum Healthcare.

FIGURE 2-1 (continued)
CONTINUUM HEALTHCARE
POTENTIAL EXPOSURE REPORT

Name: _____ Date of Exposure: _____

Social Security No.: _____ Age: _____ Sex: _____

Client Contact: _____ Phone No.: _____

Company Name: _____

I. Exposing Agent

Name of Product or Chemicals (if known): _____

_____

Characteristics (if the name is not known)

Solid Liquid Gas Fume Mist Vapor

II. Dose Determinants

What was individual doing? _____

How long did individual work in area before signs/symptoms developed? _____

Was protective gear being used? If yes, what was the PPE? _____

Was there skin contact? _____

Was the exposing agent inhaled? _____

Were other persons exposed? If yes, did they experience symptoms? _____

III. Signs and Symptoms (check off appropriate symptoms)

Immediately With Exposure:

Burning of eyes, nose, or throat
Tearing
Headache
Cough
Shortness of Breath
Chest Tightness / Pressure
Nausea / Vomiting
Dizziness
Weakness

Delayed Symptoms:

Weakness
Nausea / Vomiting
Shortness of Breath
Cough
Loss of Appetite
Abdominal Pain
Headache
Numbness / Tingling

IV. Present Status of Symptoms (check off appropriate symptoms)

Burning of eyes, nose, or throat
Tearing
Headache
Cough
Shortness of Breath
Chest Tightness / Pressure
Cyanosis
Nausea / Vomiting
Dizziness
Weakness
Loss of Appetite
Abdominal Pain
Numbness / Tingling

Have symptoms: (please check off appropriate response and give duration of symptoms)

Improved: _____ Worsened: _____ Remained Unchanged: _____

V. Treatment of Symptoms (check off appropriate response)

None: _____ Self-Medicated: _____ Physician Treated: _____

2.9 EMERGENCY CONTACTS

Table 2-1 provides a list of project-specific emergency contacts and their associated telephone numbers. This table must be posted on site where it is readily available to all site personnel.

If an emergency occurs, the following procedures are to be initiated:

- Initiate an evacuation by hand signals, voice commands, air horn, or two-way radios. Report to the designated refuge point.
- Describe to the FOL (who will serve as the Incident Coordinator) what has occurred and as many details as possible. Once all personnel are evacuated, appropriate beginning stage response procedures will be enacted to control the situation.

In the event that site personnel cannot control the incident through offensive and defensive measures, the FOL and SSO will enact the emergency notification procedures to secure additional assistance in the following manner:

- Call 911 or other emergency contacts (Table 2-1) and report the emergency. Give the emergency operator the location of the emergency, the type of emergency, the number of injured, and a brief description of what occurred. Stay on the phone and follow the instructions given by the operator. The operator will then notify and dispatch the proper emergency response agencies.

- Call GSA Physical Security, after notifying the appropriate emergency response agency, to inform them of the condition or situation, which lead to the notification of the emergency response agency.

2.10 INJURY AND ILLNESS REPORTING

After the initial response (e.g. first aid) when an injury or illness has taken place, the incidence and details of the injury or illness must be properly reported and documented. Within 24 hours of occurrence, any occupational injury or illness must be reported to the HSM at (412) 921-8912. An OSHA 101 form must be completed and submitted to the HSM within three working days of the event. A copy of this form will be maintained at the site.

It should be noted that "near misses" as well as actual injuries and illnesses should be reported. By identifying near miss situations, possible recommendations for preventing a recurrence can be made.

TABLE 2-1

EMERGENCY CONTACTS

NSWC WHITE OAK, SILVER SPRING, MARYLAND

CONTACT	PHONE NUMBER
EMERGENCY(1st Contact) (Silver Spring / Montgomery County - Police, Fire, Ambulance Service)	911
EMERGENCY(2nd Contact) GSA Physical Security, Washington, D.C. - Federal Protective Services National Capital Region	(202) 708-1111
Hospital - Holy Cross Hospital (Emergency Room) Holy Cross Hospital (Information)	 (301) 905-1225 (301) 905-0100
Chemtrec National Response Center	(800) 424-9300 (800) 424-8802
NSWC White Oak (Point-of-Contact) Robert Ridgway	(301)344-8120
TtNUS, Pittsburgh Office	(412) 921-7090
Project Manager Scott Nesbit, P.E.	(412) 921-7134
Health and Safety Manager Matthew M. Soltis, CIH, CSP	(412) 921-8912
Project Health and Safety Officer Tom Dickson, ASP	(412) 921-8457
Utilities Gas Water Sewage Telephone Fiber Optics	Maryland One-Call Miss Utility (800)257-7777

NOTE: All emergency contacts to emergency services off-base require the notification of GSA Physical Security. Information to be provided will include the type and extent of the emergency and agencies notified.

2.11 EMERGENCY ROUTE TO HOSPITAL

Directions to Holy Cross Hospital:

Exit base, make a left onto New Hampshire Rd. Continue 3 miles to I-495, take I-495 West to Exit 31, Georgia Avenue North. Make a right at the first light (Forrest Glen Rd.). The Hospital is four blocks ahead on the right side. Prior to site mobilization for field activities, a legible map indicating the travel route from the site to the Hospital will be obtained and inserted as Figure 2-1 of this HASP.

3.0 SITE BACKGROUND

3.1 SITE DESCRIPTION/HISTORY

NSWC White Oak is located east of Maryland Route 650 (New Hampshire Avenue), approximately one mile north of Interstate 495 (Washington, DC beltway). The facility encompasses approximately 710 acres and is located in Silver Spring, Maryland, in both Montgomery and Prince George counties. Approximately 635 acres of land at NSWC White Oak is undeveloped. Adjacent to the south end of the property is the U.S. Army's Adelphi Laboratory Center (ALC). Additional properties adjacent to NSWC White Oak include residential, commercial, and wooded parcels.

NSWC White Oak was originally established in 1944 as the Naval Ordnance Laboratory (NOL), with a mission to carry out research in guns and explosives. Throughout the years, the mission was expanded to include research involving torpedoes, mines, and projectiles. In September 1974, NOL combined with the Naval Weapons Laboratory, Dahlgren, Virginia, to become the Naval Surface Weapons Center, which was renamed the Naval Surface Warfare Center, Dahlgren Division, in 1988. Since that time, it has functioned as the principal Navy Research Development, Test, and Evaluation Center for surface warfare weapon systems, ordnance technology, strategic systems, and underwater weapons systems.

NSWC White Oak was identified as a Base Realignment and Closure (BRAC) facility and was closed in 1997, with the property transferred to the GSA and the U.S. Army. GSA is currently investigating plans for the reuse and development of the NSWC White Oak property.

Site activities will be performed at 2 individual areas of the NSWC White Oak facility. Specific areas include Site 1 – Parking Lot Landfill and Site 28 – Building T-14 Scrap-yard. The scope of work identified in this FSP is divided between Site 1 and Site 28. Separate EE/CAs will be performed for each site, to best determine appropriate non-time-critical removal actions. This investigation is required to obtain information to supplement existing data in order to facilitate an accurate, complete evaluation. Detailed information about these sites are presented in the following text.

3.1.1 Site 1 – Parking Lot Landfill

The Parking Lot Landfill was used as an open disposal site and landfill between 1948 and 1953. The site is located east of Building 101A and is adjacent to the Apple Orchard Landfill (IRP Site 2) and Site 32. The wastes supposedly disposed of within this landfill include lubricating oil, battery acid, metal plating wastes, and metal scrap. It has been reported that approximately 60 automobile batteries were disposed of at the site over its operating life. The site is now used as a parking lot and is paved with asphalt;

however, visible wastes from the landfill including tires, glass, and old metal equipment have been observed on the southern and eastern slopes beyond the edge of the parking lot.

The Parking Lot Landfill is a slightly sloping paved area. Runoff from the paved area is directed toward the southwestern corner. The eastern and southern faces of the landfill, outside the boundaries of the paved area, are both steeply sloped into drainage swales.

Surface water from the paved portion of the landfill is collected in a bermed area located in the southwest corner. The bermed area has been constructed with a tap water spigot and a drain which directs the runoff to a secondary containment vault.

An intermittent stream flows south in the drainage swale located parallel to the eastern edge of the landfill. A stream fed by the NPDES Outfall No. 009 flows eastward along the southern edge of the landfill. The two swales join near the southeastern corner of the landfill and the combined flow is directed east to west Point Branch Creek, along the toe of IRP Site 2, Apple Orchard Landfill.

As evidenced by observations made during temporary well placement, the Parking Lot Landfill consists mostly of fill comprised of sandy clay with a silty component and some gravel. Solid wastes including wood, metal scraps, used equipment, tires, glass, and automotive batteries are buried within the landfill. Five temporary well points were installed along the eastern and southern edges of the Parking Lot Landfill. The height of the static water levels measured within these five temporary well points lies between 14 feet and 17 feet bgs. Differences among the static water levels in the 5 temporary wells along with the locations of streams along the southern and eastern edges of the site suggest that groundwater flows through the landfill material in a southeasterly direction. See Figure 3-1 for the site layout and tag map of associated concentrations.

3.1.2 Site 28 - Building T-14 Scrap-yard

The Building T-14 Scrap-yard is a fenced area used to temporarily store materials prior to disposal or reuse (Figure 3-2). The site, which measures 150 feet by 300 feet, was used between 1967 and 1975 to store transformers directly on the hard packed gravel surface. The specific location of this former transformer staging area within Site 28 is not known. Some areas of the site are currently covered with concrete.

Because the exact location of the former transformer staging area has not been identified, nine soil sample locations were selected to aid in determining the nature and extent of any surface or subsurface soil contamination that may have resulted from these staging operations.

Site 28 is generally flat with no distinct topographical features. It gently slopes southwards at the southeastern corner. The maximum relief of the site is approximately 5 feet with a maximum elevation of 350 feet and a low elevation of 345 feet.

There are no surface water bodies at Site 28. All of NSWC White Oak is drained by Paint Branch Creek and its tributaries. The nearest surface water body is a small south flowing tributary of Paint Branch located approximately 500 feet to the south of the site. The stream flows toward the southeast and empties into Paint Branch Creek.

Boring logs for drilling activity at Site 28 indicated a gravel layer (inside the fenced yard) to a depth of approximately 2 feet. Underlying the gravel layer inside the fenced area and in the area surrounding the fenced scrap-yard, the soil is a mixture of clay, silt, and sand. None of the Site 28 borings extended beyond 4 feet deep. But because of observations made at deeper borings on neighboring sites, it is expected that the same coastal plain deposits identified in other areas of NSWC White Oak, overlay a saprolite bedrock layer at Site 28. See Figures 3-2 and 3-3 for Site Layout and Tag Map.

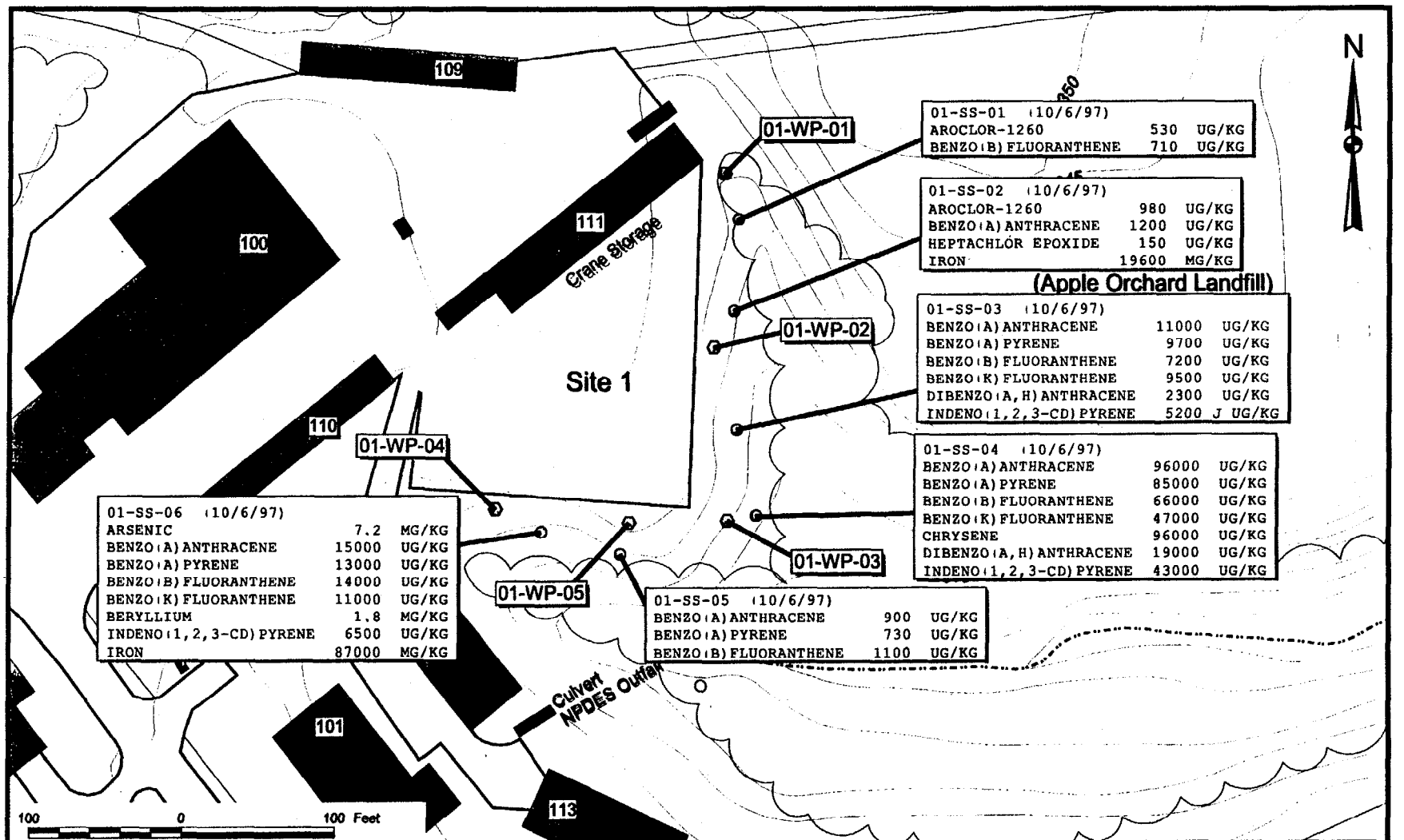

FIGURE 3-1

DRAWN BY	DATE	Tetra Tech NUS, Inc.	CONTRACT NUMBER	OWNER NUMBER
MJJ	23SEPT98		7909	0101
CHECKED BY	DATE	ANALYTICAL DATA - SURFACE SOIL SITE 1 / SWMU 3 - PARKING LOT LANDFILL NSWC - WHITE OAK SILVER SPRINGS, MARYLAND	APPROVED BY	DATE 10/2/98
COST/SCHEDULE-AREA			APPROVED BY	DATE
SCALE AS NOTED			DRAWING NO	REV 0

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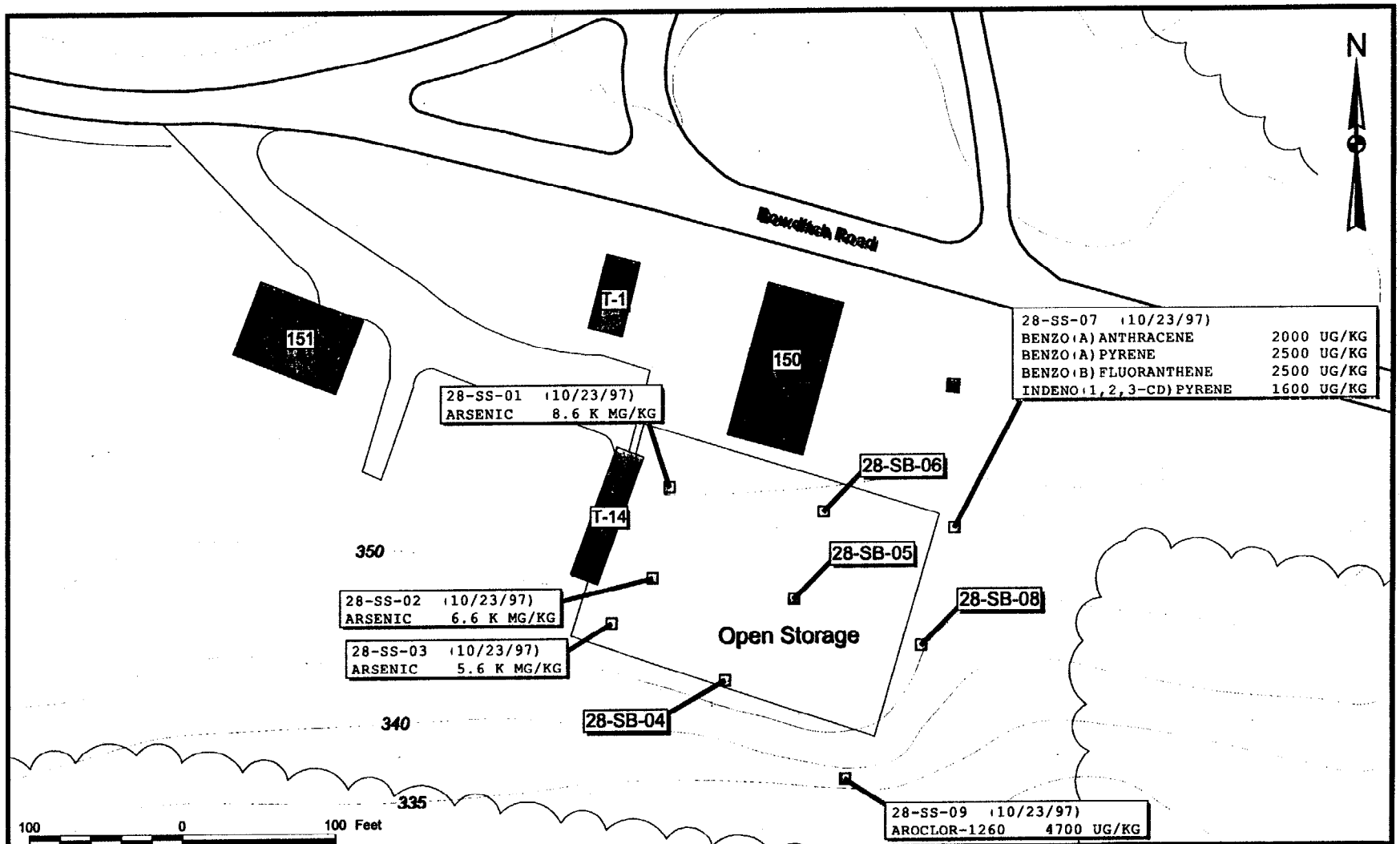

DRAWN BY MJJ DATE 23SEPT98	Tetra Tech NUS, Inc.	CONTRACT NUMBER 7909	OWNER NUMBER 0101
CHECKED BY DATE	ANALYTICAL DATA - SURFACE SOIL SITE 28 / SWMU 88 - BUILDING T-14 SCRAPYARD NSWC - WHITE OAK SILVER SPRINGS, MARYLAND	APPROVED BY SN DATE 10/2/98	
COST/SCHEDULE-AREA		APPROVED BY DATE	
SCALE AS NOTED		DRAWING NO	REV 0

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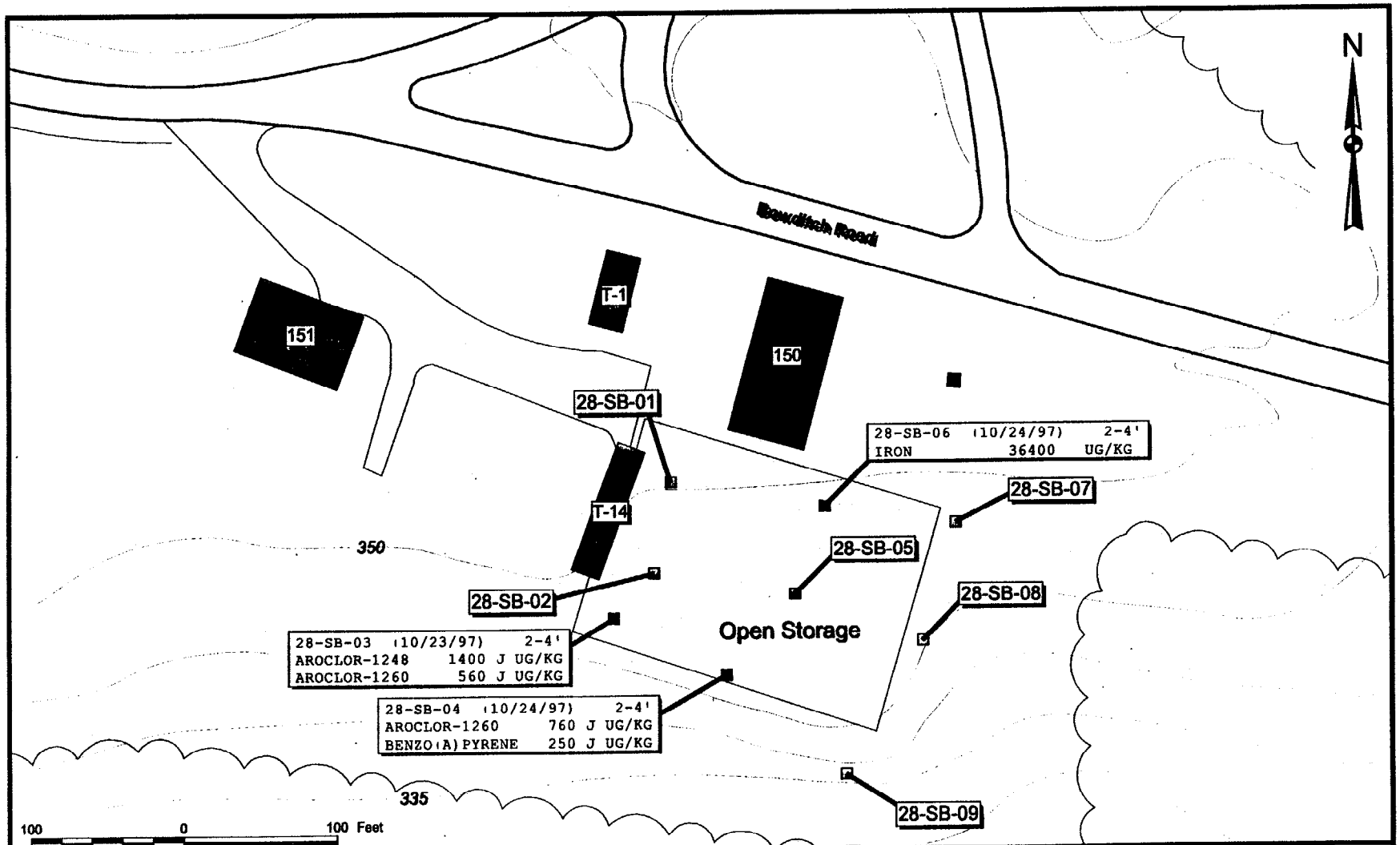
FIGURE 3-2



DRAWN BY MJJ — DATE 23SEPT98	Tetra Tech NUS, Inc.	CONTRACT NUMBER 7909	OWNER NUMBER 0101
CHECKED BY — DATE	ANALYTICAL DATA - SUBSURFACE SOIL SITE 28 / SWMU 88 - BUILDING T-14 SCRAPYARD NSWC - WHITE OAK SILVER SPRINGS, MARYLAND	APPROVED BY SN	DATE 10/2/98
COST/SCHEDULE-AREA		APPROVED BY	DATE
SCALE AS NOTED		DRAWING NO. 1	REV 0

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FIGURE 3-3

4.0 SCOPE OF WORK

This section discusses the activities that are to be performed at the NSWC White Oak. Table 5-1 of this HASP provides information related to each of the tasks that are to be performed as part of the scope of work. Additionally, partially completed SWPs for site tasks are provided. These SWPs discuss hazards associated with tasks performed at each site location and the appropriate controls measures that are to be implemented during the performance of site activities. Additional information (such as site personnel and information of a site-specific nature such as emergency assembly points) will be added to the SWP prior to the commencement of site activities. The planned activities involved in this effort are presented in detail in the Work Plan developed for this project. If new tasks are to be performed at the site, Table 5-1 and this section will be modified accordingly and additional SWPs will be developed. If tasks other than those described below are performed at the site, this section and the HASP will be modified accordingly.

Field activities to be performed by TtNUS and subcontractor personnel will be as follows:

- Multi-media sampling (to determine the vertical and lateral extent of contamination)
  - Surface and subsurface soil sampling - Sample acquisition will be accomplished by direct access (hand trowels), test pit excavation, and/or by hand augering.
- Mobilization/demobilization activities
- Investigative Derived Waste (IDW) sampling
- Geographical/geophysical surveying
- Excavation of test pits (4 to 10 foot depths) at Site 1 – Parking Lot Landfill

5.0 TASKS/HAZARDS/ASSOCIATED CONTROL MEASURES SUMMARIZATION

Table 5-1 of this section serves as the primary portion of the site specific HASP which identifies the tasks that are to be performed as part of the scope of work. The anticipated hazards, recommended control measures, air monitoring recommendations, required Personal Protective Equipment (PPE), and decontamination measures for each site task are discussed in detail. This table and the associated control measures shall be revised, if the scope of work, contaminants of concern, or other conditions change.

Through using the table, site personnel can determine which hazards are associated with each task and at each site, and what associated control measures are necessary to minimize potential exposure or injuries related to those hazards. The table also assists field team members in determining which PPE and decontamination procedures to use based on proper air monitoring techniques and site-specific conditions.

As discussed earlier, a Health and Safety Guidance Manual accompanies this table and HASP. The manual is designed to further explain supporting programs and elements for other site-specific aspects as required by 29 CFR 1910.120. The Guidance Manual should be referenced for additional information regarding air monitoring instrumentation, decontamination activities, emergency response, hazard assessments, hazard communication and hearing conservation programs, medical surveillance, PPE, respiratory protection, site control measures, standard work practices, and training requirements. Many of TtNUS's SOPs are also provided in this Guidance Manual.

SWPs issued for all exclusion zone activities (See Section 9.10) will be based on elements defined in Table 5-1. The FOL and/or the SSO completing the SWP will add additional site-specific information.

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TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES SUMMARIZATION
NAVAL SURFACE WARFARE CENTER - WHITE OAK, SILVER SPRINGS, MARYLAND

Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring Type/Action Levels	Personal Protective Equipment	Decontamination Procedures
Mobilization/ Demobilization	***Chemical hazards:*** Exposure to potential site contaminants is not anticipated during this activity. However, chemicals brought on site in support of field activities are to be identified, logged, accompanied by an appropriate MSDS, properly stored, and evaluated for purposes of hazard communication. ***Physical hazards:*** Potential physical hazards associated with this task may include: 1) Lifting (muscle strains and pulls) 2) Pinches and compressions 3) Slip, trips, and falls 4) Moving machinery 5) Vehicular and foot traffic ***Natural Hazards:*** 6) Insect, animal bites and stings, poisonous plants, etc.	***Chemical hazards:*** To eliminate potential chemical hazards associated with this task ensure the following: - A chemical inventory list is generated for all chemicals brought on site (Complete Section 5.0 of the Health and Safety Guidance Manual). - MSDS must be available for all chemicals brought on site. - Materials are stored in accordance with recommended practices and according to compatibility (See MSDS for storage and compatibility recommendations). ***Physical hazards:*** 1) Employ machinery or multiple personnel for heavy lifts. - Use proper lifting techniques. 2) Keep any machine guarding in place. Avoid moving parts. Secure loose clothing, jewelry, or long hair that could become entangled. 3) Preview and prepare work locations where unstable/uneven terrain exists. Barricade all excavations and embankments deeper than 2 feet. 4) All equipment to be employed will be - Inspected in accordance with OSHA and manufacturers design. The inspection will include the completion of the Equipment Record Sheet documenting the review and acceptance/failure of safety devices, guards, emergency stops. The Equipment Inspection Checklist is provided in Attachment II of this HASP. - Operated by knowledgeable operators, and knowledgeable ground crew, as applicable. - Establish safe zones of approach. - Secure all loose articles to avoid possible entanglement. 5) Identify all access/egress routes and locations to within established areas of operation. - All equipment capable of self propelled movement will be equipped with movement alarms as applicable. - Traffic regulations for NSWC - White Oak are to be followed as posted. 6) Avoid potential nesting areas of biting/stinging insects and animals. Use commercially available insect repellents. Avoid contact with poisonous vegetation. Wear appropriate clothing. Tape ankle and wrists areas to prevent ticks, chiggers, etc. from attaching themselves to you skin. Wear light colored clothing so that ticks and other biting insects can be easily visible and be removed. Follow directions as specified in Section 6.3 concerning natural hazards.	Not required during mobilization/demobilization.	Mobilization/demobilization activities are intended to initiate and proceed in Level D protection: Level D - (Minimum Requirements) - Standard field attire (Sleeved shirt; long pants; or coveralls) - Safety shoes or boots with steel toe - Safety glasses, when potential eye hazards may exist. - Hardhat (when overhead hazards exists, or identified as an operation requirement) - Reflective vest for high traffic areas - Hearing protection for high noise areas, or as directed on an operation by operation scenario. As a general rule of thumb, if you need to raise your voice to be heard while engaged in conversation with someone who is within 2 feet of your position you may be exposed to excessive noise levels and should employ hearing protection until the SSO can quantify the potential hazard through sound level measurements or noise dosimetry. **Note:** The Safe Work Permit(s) for this task (see Attachment II) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.	As potential site contaminants are not anticipated to be encountered as part of this task, personal decontamination is not required. All equipment arriving/leaving the site will be inspected prior to permitting this equipment to enter or exit the site. The SSO will inspect the equipment and give the clearance to allow the equipment to pass. Failure to pass inspection will prohibit entering or exiting the site as applicable. All equipment which fails the inspection will have to be decontaminated again to a level acceptable to the SSO prior to passage on or off site. All equipment permitted to pass on/off site will be documented using an Equipment Inspection Checklist. This form may be found in Attachment II of this HASP.

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TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES SUMMARIZATION
NAVALSURFACE WARFARE CENTER - WHITE OAK, SILVER SPRINGS, MARYLAND

Task/Operation/ Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring/Type and Action Levels	Personal Protective Equipment	Decontamination Procedures
Multi-media sampling including soils (surface and subsurface); sediments; Investigative Derived Waste (IDW). The protective measures identified for this activity will also apply to miscellaneous activities such as water-level measurements, aquifer testing, etc.	***Chemical hazards:*** Site 01/SWMU 03 – Parking Lot Landfill – Information available indicates the following: Metals: (Highest value of previous positive detections in mg/kg). Arsenic (7.2), barium (186), cadmium(5.7), chromium(46.3), copper(187), lead(1170), mercury(1.7). Semi-Volatiles: (Highest value of previous positive detections in µg/kg). Anthracene(96000), Benzo (A) Anthracene (85000), Benzo (B) Fluoranthene(66000), Benzo (G,H,I) Perylene(47000), Chrysene (96000), Dibenzofuran (16000), Fluoranthene (230000), Naphthalene(19000), Pyrene (180000) Pesticides/PCBs: (Highest value of previous positive detections in µg/kg). 4,4'DDE(74) Potential site contaminants vary from site to site. Specific contaminants of concern have not been accurately determined and no analytical data are available to evaluate contaminants that may pose an exposure concern. Section 2.0 of the Field Sampling Plan provides background information and general contaminants that may be associated with each site. Based on this historical information potential site contaminants may include metals, explosives and explosive compounds, waste oils and constituents of petroleum, VOCs including solvents, and corrosives. Refer to individual Safe Work Permits contained in Attachment IV for specific contaminants of concern associated with particular sites and site activities. 2) Transfer of contaminants into clean areas or onto persons ***Physical hazards:*** 3) Lifting (muscle strains and pulls) 4) Pinches and compressions 5) Slip, trips, and falls ***Natural Hazards:*** 6) Insect, animal bites and stings, poisonous plants, etc.	***Chemical hazards:*** 1) Employ real-time monitoring instrumentation, action levels, and identified PPE to identify, quantify, and control exposures to potentially contaminated medias (e.g., air, water, soils). 2) Restrict the cross use of equipment and supplies between sampling locations without first going through a suitable decontamination. ***Physical hazards:*** 3) Employ machinery or multiple personnel for heavy lifts. Use proper lifting techniques. 4) Keep any machine guarding in place. Avoid moving parts. Secure loose clothing, jewelry, or long hair that could become entangled. 5) Preview work locations for unstable/uneven terrain. Barricade all excavations deeper than 2 feet. 6) Avoid potential nesting areas of biting/stinging insects and animals. Use commercially available insect repellents. Avoid contact with poisonous vegetation. Wear appropriate clothing. Tape ankle and wrist areas to prevent ticks, chiggers, etc. from attaching themselves to your skin. Wear light colored clothing so that ticks and other biting insects can be easily visible and be removed. Follow directions as specified in Section 6.3 concerning natural hazards.	**Elevated airborne concentrations in worker breathing zones that may pose an exposure concern to field crews or downwind receptors are not anticipated to be generated as a result of sampling activities. The following information is provided as a contingency action only.** Direct reading instrument such as photoionization detectors with an 10.6 eV source or flame ionization detectors will be employed as a general screening instrument to detect volatile organic compounds, elemental decomposition products and carrier substances and to evaluate airborne concentrations of potential site contaminants: These instruments will only be employed as a screening devices. Monitor source areas (boleholes, test pits, sample media, etc.) using a PID with 10.6 eV lamp at regular intervals to be determined by the SSO. Positive sustained results at a source or downwind location(s) which may impact operations crew will require the following actions: • Monitor the breathing zone of at-risk and downwind employees. Any sustained reading (greater than 1 minute in duration) above background levels in worker breathing zones requires site activities to be suspended and site personnel to report to an unaffected area. • Work may only resume if airborne readings in worker breathing zone return to background levels. If elevated readings in worker breathing zone persist the PHSO and HSM will be contacted to determine necessary actions and levels of protection. NOTE: Radioactive contaminants are not anticipated, however, during this task a general screening of the spoils removed from the pit will be performed. Some of the contaminants of concern are metals, PCBs, etc., and may not be detectable using FID direct reading instruments. Also, site contaminants may adhere to or be part of airborne dusts or particulates generated during site activities. As a result, generation of dusts at all sites should be minimized to the greatest extent possible to avoid inhalation of contaminated dusts or particulates. Evaluation of dust concentrations will be qualitative by observing work conditions for visible dust clouds or accumulations. Potential exposure to contaminants attached to dust particles will be controlled by using water to suppress dusts or by avoiding dust plumes (i.e., termination of activities until dust subsides).	All sampling activities are anticipated to proceed in a modified Level D protection, or as specified on the Safe Work Permit (Attachment IV). Level D - (Minimum Requirements) For sampling activities: - Standard field attire (Sleeved shirt; long pants) - Safety shoes or boots(Steel toe) - Safety glasses - Inner nitrile gloves (Clean pair for each sample location) - *Hard-hat (when overhead hazards exists, or identified as a operation requirement)* - *Reflective vest for high traffic areas* - *Hearing protection for high noise areas, or as directed on an operation by operation scenario.* *Italicize text represents optional equipment to be worn as conditions dictate.* **Note:** The Safe Work Permit(s) for this task (see Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.	Decontaminate sample containers in accordance with the Field Sampling Plan. **Personnel decontamination:** - Equipment drop-off - Wash and rinse reusable outer protective garments - Remove and dispose of disposable PPE - Wash hands and face, leave contamination reduction zone. **Equipment decontamination:** All sampling equipment will undergo a soap/water wash and rinse utilizing a suitable potable water source until visibly clean. Sampling equipment may also be high pressure soap/water wash and rinse or steam cleaned. All chemical decontamination will proceed in accordance with the other site documents such as Field Sampling Plan.

TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES SUMMARIZATION
NAVAL SURFACE WARFARE CENTER - WHITE OAK, SILVER SPRINGS, MARYLAND

Task/Operation/ Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring Type/Action Levels	Personal Protective Equipment	Decontamination Procedures
Excavation of Test Pits at Site 01/SWMU 03 – Parking Lot Landfill. The purpose of this activity is to delineate the edges of the landfill and to secure subsurface soil samples in the process.	***Chemical hazards:*** Site 01/SWMU 03: Metals: (Highest value of previous positive detection's in mg/kg). Arsenic (7.2), barium (186), cadmium(5.7), chromium(46.3), copper(187), lead(1170), mercury(1.7). Semi-Volatiles: (Highest value of previous positive detection's in µg/kg). Anthracene(96000), Benzo (A) Anthracene (85000), Benzo (B) Fluoranthene(66000), Benzo (G,H,I) Perylene(47000), Chrysene (96000), Dibenzofuran (16000), Fluoranthene (230000), Naphthalene(19000), Pyrene (180000) Pesticides/PCBs: (Highest value of previous positive detection's in µg/kg). 4,4'DDE(74) 2) Transfer of contamination into clean areas or onto persons. ***Physical hazards:*** 3) Moving machinery 4) Collapse of the excavation 5) Energized systems 6) Noise 7) Vehicular and foot traffic ***Natural Hazards:*** 9) Insect, .animal bites, and stings, poisonous plants, etc.	***Chemical hazards:*** 1) Employ dust suppression such as area wetting to control particulates as the largest concentration of the contaminants identified will be present as particulates or bound to particulates Employ identified PPE and control exposures to potentially contaminated media (e.g., air, water, soils). Use monitoring instruments to evaluated airborne concentrations of potential site contaminants. 2) Restrict the cross use of equipment and supplies between locations and activities without first going through a suitable decontamination. ***Physical hazards:*** 3) All equipment to be employed will be: - Inspected in accordance with Federal safety and transportation guidelines, OSHA (1926.600,.601,.602), and manufacturer's design, and documented as such using Equipment Inspection Checklist provided as Attachment II. Complete the Equipment Inspection Checklist for each piece of equipment used at the site. - Operated by knowledgeable operators and ground crew, as applicable. 4) All excavations shall be in conformance with requirements established under 29 CFR 1926.650 - .652 concerning sloping, shoring, storage, and movement on and over and around trenches and excavations. - **No personnel associated with this field effort will enter any excavations (including test pits).** - All supplies, clean fill, vehicular traffic will be maintained at a minimum distance of 3 feet from the excavation, or 2 feet if a sidewall restraining device is employed. - Should intact containers be uncovered, the excavation activities shall be halted until contingency plans may be formulated and put in place for investigating intact containers. - Excavations will not proceed any closer than 6 feet to any foundation, footer, and/or support base. - The teeth of the bucket will have a flat bar or cutting bar attached to the teeth to prevent the teeth of the backhoe from snagging an undetected utility. - No test pit will be permitted to be left open, unattended. - Site control during excavation will be accomplished through the use of barricade tape and weighted poles and signs indicating excavation in progress 5) All utility clearances shall be obtained prior to any excavation or demolition activities. Where the utility clearance cannot be obtained in a reasonable period, or not located, excavations shall proceed with extreme caution and proceed using cable and piping locators and other geophysical detection methods to avoid utility damage. 6) Excessive noise levels will be controlled through the use of hearing protection. Anticipated excessive noise level operations include the following: - Heavy equipment operation including backhoes and multi-axle vehicles, etc. 7) Traffic and equipment considerations are to include the following: - Establish safe zones of approach (i.e., Boom + 3 feet). - All equipment shall be equipped with movement warning systems. - Employ safety belts and follow the site traffic rules. 9) Avoid potential nesting areas of biting/stinging insects and animals. Use commercially available insect repellents. Avoid contact with poisonous vegetation. Wear appropriate clothing. Tape ankle and wrist areas to prevent ticks, chiggers, etc., from attaching themselves to yourt skin. Wear light colored clothing so that ticks and other biting insects can be easily visible and be removed. Follow directions as specified in Section 6.3 concerning natural hazards.	**Elevated airborne concentrations in worker breathing zones are not anticipated to be generated as a result of test pit operations** Direct reading instrument such as photoionization detectors with an 10.6 eV source or flame ionization detectors will be employed as a general screening instrument to detect volatile organic compounds, elemental decomposition products and carrier substances and to evaluate airborne concentrations of potential site contaminants: These instruments will only be employed as a screening devices. Monitor source areas (boleholes, test pits, sample media, etc.) using a PID with 10.6 eV lamp at regular intervals to be determined by the SSO. Positive sustained results at a source or downwind location(s) which may impact operations crew will require the following actions: • Monitor the breathing zone of at-risk and downwind employees. Any sustained reading (greater than 1 minute in duration) above background levels in worker breathing zones requires site activities to be suspended and site personnel to report to an unaffected area. • Work may only resume if airborne readings in worker breathing zone return to background levels. If elevated readings in worker breathing zone persist, the PHSO and HSM will be contacted to determine necessary actions and levels of protection. Some of the contaminants of concern are particulate in nature such as metals, and may not be detectable using direct reading instruments. Also, site contaminants may adhere to or be part of airborne dusts or particulates generated during site activities. As a result, generation of dusts at all sites should be minimized to the greatest extent possible to avoid inhalation of contaminated dusts or particulates. Evaluation of dust concentrations will be qualitative by observing work conditions for visible dust clouds or accumulations. Potential exposure to contaminants attached to dust particles will be controlled by using water to suppress dusts or by avoiding dust plumes (i.e., termination of activities until dust subsides). NOTE: Radioactive contaminants are not anticipated, however, during this task a general screening of the spoils removed from the pit will be performed. Where the utility clearance cannot be determined, test pit excavations shall proceed with extreme caution using a magnetometer for periodic surveys every 2 feet to a depth of at least 10 feet.	All test pitting and demolition operations are to be initiated in Level D protection. Level D protection constitutes the following minimum protection - Standard field dress (long pants, sleeved shirts) - Steel toe safety shoes or boots - Hard-hat, safety glasses, and earplugs or muffs. - *Tyvek coveralls will be worn if there is a possibility of soiling work attire* - *Impermeable boot covers* - *PVC or PE coated Tyvek will be incorporated if there is a potential for saturation of work attire.* - *Gloves – Nitrile for handling soils and/or debris* *(These items are optional as conditions dictate)* **Note:** The Safe Work Permit(s) for this task (see Attachment II) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task. As site conditions may change, the following equipment will be maintained during all on site activities - Fire Extinguishers - Stretcher, blankets, and first-aid kit	**Personnel Decontamination** - Will consist of a soap/water wash and rinse for outer protective equipment (e.g., boots, gloves, PVC splash suits, etc.). This function will take place at an area adjacent to the test pitting operations bordering the support zone. This decontamination procedure for **Level D** protection will consist of - Equipment drop - Soap/water wash and rinse of reusable PPE (e.g., splash suits), as applicable - Removal and disposal of disposable PPE items (gloves, disposable boot covers, etc) - Wash hands and face, leave contamination reduction zone.

TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES SUMMARIZATION
NAVAL SURFACE WARFARE CENTER - WHITE OAK, SILVER SPRINGS, MARYLAND

Task/Operation/ Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring/Type and Action Levels	Personal Protective Equipment	Decontamination Procedures
Decontamination of sampling and heavy equipment	***Chemical hazards:*** Potential site contaminants vary from site to site. Specific contaminants of concern have not be accurately determined and no analytical data is available to evaluate contaminants that may pose an exposure concern. Section 2.0 of the Field Sampling Plan provides background information and general contaminants that may be associated with each site. Based on this historical information, potential site contaminants may include metals, semi-volatiles compounds, waste oils and constituents of petroleum, VOCs including solvents, and corrosives. Refer to individual Safe Work Permits contained in Attachment IV for specific contaminants of concern associated with particular sites and site activities. - Decontamination fluids - Liquinox (detergent), isopropanol, methanol, etc. ***Physical hazards:*** 2) Lifting (muscle strains and pulls) 3) Pinches and compressions 4) Noise 5) Flying Projectiles	1) Employ protective equipment to minimize contact with site contaminants and hazardous decontamination fluids. - Have a means by which the eyes and/or skin may be flushed (i.e., portable camp shower, emergency eyewash, etc.) readily accessible. - Obtain manufacturer's MSDS for any decontamination solvents used on-site. Users of solvents must review the MSDS and have ready access to it on-site. Maintain a Chemical Inventory and a file of MSDSs for all hazardous chemicals brought to the site. Users must observe MSDS requirements with regard to chemical use, storage, spill response, PPE, and other aspects. Use of solvents will be restricted to outdoor locations (i.e., this activity is restricted from inside a trailer or other small or poorly-ventilated space). 2) Use multiple persons where necessary for lifting and handling heavy pieces of equipment for decontamination purposes. 3) Place or stack equipment securely during decontamination and air drying to prevent unstable items from falling. 4) Steam/pressure washer operators will wear hearing protection. Other personnel will be restricted from the area (i.e., no closer than 20 feet) to minimize their potentials to exposure to noise, overspray, and flying projectiles. 5) Wear appropriate protection (splash shield to protect pressure washer operator). Place shields around the area when this potential exists to protect others within the area.	1) Use visual observation and real-time monitoring instrumentation to ensure all equipment and/or areas which have been cleaned and dried are properly cleaned of potentially contaminated medias (e.g., air, water, soils). **Elevated airborne concentrations impacting field crews or downwind receptors are not anticipated for this task.**	***For Backhoe:*** This applies to high pressure soap/water, steam cleaning wash and rinse procedures. Level D (Minimum requirements) - - Standard field attire (sleeved shirt; long pants) - Safety shoes or boots(Steel toe) - Nitrile outer gloves - Safety glasses underneath a splash shield - *PVC Rain suits or PE or PVC coated Tyvek as protection from splash as required* - *Chemical resistant boot covers* - *Hearing protection (plugs or muffs)* *NOTE: Italicized PPE specifies optional equipment to be used as conditions dictate.* ***For sampling equipment including trowels, macro samplers, bailers, etc.:*** Observe MSDS requirements, but not less than Level D Minimum requirements - - Standard field attire (sleeved shirt; long pants) - Safety shoes or boots(Steel toe) - Nitrile outer gloves - Safety glasses In the event of overspray of chemical decontamination fluids employ PVC rain suits or PE or PVC coated Tyvek as necessary. Respiratory protection is not anticipated for these activities. **Note:** The Safe Work Permit(s) for this task (see Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.	This decontamination procedure for **Level D** protection will consist of - Remove and dispose of any disposable PPE (Tyvek coveralls, outer gloves, etc.) - Soap/water wash and rinse of reusable PPE items (e.g., splash suit, boots). - Wash hands and face; leave contamination reduction zone **Equipment Decontamination** - All equipment decontamination will take place at a centralized decontamination pad utilizing steam or pressure washers. Heavy equipment such as the backhoe will have the wheels and tires cleaned along with any loose debris removed, prior to transporting to the central decontamination area. All site vehicles will have restricted access to exclusion zones, and will have their wheels/tires sprayed off as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the on site activity. All equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site. The FOL or the SSO will be responsible for evaluating equipment arriving at and leaving the site. No equipment will be authorized access or exit without this authorization. Evaluation will consist of - Visual inspection - Scanning equipment with monitoring instruments

6.0 HAZARD ASSESSMENT

The following section provides information on the chemical, physical, and natural hazards that may be associated with the NSWC White Oak site, and the activities that are to be conducted as part of the scope of work. It should be noted that little information regarding the type and concentrations of potential site contaminants are available for the two sites to be investigated. The purpose of the sampling activities associated with this investigation is to determine the nature and extent of any contamination present and to determine viable treatment options. The information that is available consists of historical information regarding past activities conducted at each site, and possible chemicals that were used or disposed of at each site.

Table 6-1 contains a partial list of chemicals known or suspected to have been handled and/or disposed of at the various sites that are to be investigated. The table includes various explosive compounds, solvents, fuels, and metals. Specifically, toxicological information, exposure limits, symptoms of exposure, physical properties, and air monitoring and sampling data are discussed in this table. Additionally, Section 6.3 discusses potential biological hazards that may be encountered during field activities and the control measures necessary to minimize or eliminate these hazards.

6.1 CHEMICAL HAZARDS

As previously discussed, information regarding the type of site contaminants associated with the sites to be investigated is limited. The focus of this field investigation is to further define the vertical and horizontal extent of contamination. Given this information viable treatment options may be evaluated. Despite the limited information, significant concentrations of potential site contaminants are unlikely to be present given the available historical data and the long-term inactive status of many of the sites to be investigated.

Based on prior activities and historical information, various classes of chemicals were handled and/or disposed of at each of the sites. The chemical classes are:

- Metals
- Waste oils
- Volatile organic compounds (VOCs), including solvents and halogenated hydrocarbons
- SVOCs, including PCBs

Potential occupational exposures to field crews are not anticipated to occur given the proposed site activities and previously detected very low concentrations of site contaminants. Table 6-1 provides

information on some of the potential contaminants of concern at the sites to be investigated. Included is information on the chemical, physical, and toxicological properties of these substances.

6.2 PHYSICAL HAZARDS

In addition to the chemical hazards discussed above, the following physical hazards may be present during the performance of site activities.

- Moving machinery/ Vehicular and foot traffic (contact/entanglement with equipment or machinery).
- Slips, trips, and falls.
- Energized systems (contact with underground or overhead utilities).
- Lifting (muscle strains and pulls).
- Pinches and compressions.
- Noise (in excess of 85 decibels).
- Inclement weather.
- Excavation collapse.
- Flying projectiles.

These physical hazards and their applicability to each site task are discussed in detail in Table 5-1. Additionally, each of these physical hazards is discussed in greater detail in the Tetra Tech NUS Health and Safety Guidance Manual.

6.3 NATURAL HAZARDS

During field activities site personnel may also encounter various biological/natural hazards including:

- Insect bites and stings
- Vector (Ticks, mosquitoes, etc.) transmitted illnesses and diseases
- Snakes and other wild animal encounters
- Poisonous plants

6.3.1 Insect Bites and Stings

Insect bites and stings are difficult to control given the climate and environmental setting of NSWC White Oak. However, in an effort to minimize this hazard the following control measures will be initiated where possible.

TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
PAGE 1 OF 6

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Chrysene	218-01-9	PID: Ionization potential 7.59 eV, relative response ratio unknown. FID: Relative response ratio for FID detection is unknown.	Air sample using 37 mm cassette, glass fiber, binder free, 1.0 micron pore size; HPLC-UV detection. Sampling and analytical protocol in accordance with OSHA 58 or NIOSH Method #1(184).	It is recommended that 0.2 mg/m³ for coal tar pitch volatiles be used where airborne concentrations may exist. This is relevant as this Polynuclear Aromatic Hydrocarbon (PAH) is considered to be a suspect human carcinogen.	Information regarding this substance was limited. This material is a natural constituent of coal tar. Adequate - Odor threshold 0.08-0.22 ppm. The use of air-purifying respirators with organic vapor cartridge up to 10 ppm is acceptable, providing cartridges are changed at the beginning of each shift. **Recommended gloves:** Butyl - >8.00 hrs; are recommended for other coal tar pitch associated substances; Neoprene >4.00 hrs; Nitrile >1.00 hrs	**Boiling Pt:** 910°F; 488°C **Melting Pt:** 489°F; 254°C **Solubility:** Insoluble in water **Flash Pt:** 143°F; 62°C **LEL/LFL:** 1.1% @ 200°F; 93°C **UEL/UFL:** 12.7% @ 275°F; 135°C **Vapor Density:** 4.07 **Vapor Pressure:** 0.8 mmHg @ 72°F; 22° C **Density:** 1.274 **Specific Gravity:** 1.274 **Incompatibilities:** Strong oxidizers, strong caustics, and strong acids **Appearance and Odor:** Crystals	This substance is considered a suspected human carcinogen.
Phenanthrene	85-01-8	Ionization potential for this compound is unknown. This material is combustible, however, the relative response ratio concerning FID detection is unknown.	Air sample using glass fiber filter, 37 mm cassette with pore size ranging from 0.8 to 1.0 microns in size; Gravimetric or HPLC-UV detection; Sampling and analytical protocol in accordance with OSHA Method #58.	It is recommended that 0.2 mg/m³ for coal tar pitch volatiles be employed where excessive airborne concentrations may exist. This is more relevant for those PAHs considered carcinogenic. This substance is considered questionable regarding carcinogenic potential.	Information regarding this substance was limited. This material is a natural constituent of coal tar. Adequate - Odor threshold 0.055-0.060 ppm. The use of air-purifying respirators with organic vapor cartridge up to 10 ppm is acceptable, providing cartridges are changed at the beginning of each shift. **Recommended gloves:** Butyl - >8.00 hrs; are recommended for other coal tar pitch associated substances; Neoprene >4.00 hrs; Nitrile >1.00 hrs	**Boiling Pt:** 644°F; 340°C **Melting Pt:** 212°F; 100°C **Solubility:** Insoluble in water **Flash Pt:** Not available **LEL/LFL:** Not available **UEL/UFL:** Not available **Density:** 1.179 @ 77°F; 25°C **Vapor Density:** 6.14 **Vapor Pressure:** 1 mmHg @ 245°F; 118.3°C **Specific Gravity:** 1.025 **Incompatibilities:** Strong oxidizers, alkalis, and acids. **Appearance and Odor:** Colorless leaflets with a burnt acrid odor.	Overexposure to this substance has shown to be a skin, eye, and mucous membrane irritant. This substance is considered a photosensitizer and mild allergen. This substance is considered mildly to moderately toxic by ingestion.

TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
PAGE 2 OF 6

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Chloroform	67-66-3	PID: I.P. 11.42 eV, relative response ratio unknown. FID: 100% response with FID.	Air sample using charcoal sorbent tube and carbon disulfide desorption with gas chromatography flame ionization detector; Sample and analytical protocol in accordance with NIOSH Method #1003.	OSHA: 50 ppm (ceiling) NIOSH: STEL 2 ppm ACGIH: 10 ppm IDLH: 500 ppm	Inadequate - Odor threshold 133 - 276 ppm. Chloroform has poor warning properties but will adhere to organic vapor cartridges. Supplied air respirators are recommended. **Recommended glove:** Polyvinyl Alcohol >8.00 hrs; Viton 9.50 hrs; Teflon >3.60 hrs	**Boiling Pt:** 143°F; 62°C **Melting Pt:** -81°F; -62°C **Solubility:** 0.5% **Flash Pt:** Not available **LEL/LFL:** Not available **UEL/UFL:** Not available **Vapor Density:** Not available **Vapor Pressure:** 160 mmHg @ 68°F; 20° C **Specific Gravity:** 1.48 **Incompatibilities:** Strong caustics, chemically active metals such as aluminum or magnesium powder, sodium and potassium, strong oxidizers **Appearance and Odor:** Colorless liquid with a sweet pleasant odor.	Overexposure to this substance may cause dizziness, mental dullness, nausea, headache, fatigue, anaesthesia, and irritation of the skin and eyes. Chronic overexposure may result in damage to the liver, kidneys, heart, eyes and skin.
Arsenic	7440-38-2	Particulate form - This substance is unable to be detected by PID/FID.	Air sample using a particulate filter; acid desorption; Atomic Absorption Spectroscopy (AAS) detection. Sampling and analytical protocol shall proceed in accordance with NIOSH Method #7300.	OSHA: Organic compounds 0.5 mg/m³ Inorganic compounds 0.01 mg/m³ NIOSH: (Ceiling) 0.002 mg/m³ ACGIH: 0.2 mg/m³ IDLH: 5 mg/m³ as arsenic	No identifiable warning properties to indicate presence and thereby detection. **Recommended APR Cartridge:** Suitable for dust and fume. Organic vapor acid gases with HEPA filter. This substance may be presented as a pesticide, therefore a cartridge suitable for pesticides (MSA-GMP). **Recommended Gloves:** This is in the particulate form. Therefore any glove suitable to prevent skin contact (Nitrile has been the one most widely used for the other substances).	**Boiling Pt:** sublimation @ 1134°F; 612°C **Melting Pt:** 1497°F; 814°C @ 36 atm **Solubility:** Insoluble in water;soluble in nitric acid **Flash Pt:** Nonflammable, however, airborne in the form of a dust this substance will support combustion **LEL/LFL:** Nonflammable **UEL/UFL:** Nonflammable **Vapor Density:** Not available **Vapor Pressure:** 1 mmHg @ 372°C (sublimes) **Specific Gravity:** 5.73 **Incompatibilities:** Oxidizers, halogens,zinc, lithium, azides, and acetylides **Appearance and odor:** Gray to black, brittle, crystalline, amorphous, odorless.	Overexposure to this substance through inhalation or ingestion may result in ulceration of the nasal septum, GI disturbances resulting in violent purging and vomiting, hoarse voice, sore throat, excessive salivation, peripheral neuropathy (numbness and burning sensations beginning at the extremities followed by motor weakness), respiratory irritation leading to possible pulmonary edema. Skin or eye contact may result in irritation, conjunctiva, dermatitis, and hyperpigmentation (darkening of the areas exposed) of the skin. This substance has been judged to be a Human carcinogen by NTP, and IARC.

TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Beryllium	7440-41-7 as Be	Particulate form - This substance is unable to be detected by PID/FID.	Air sample using a particulate filter; acid desorption; AAS/GF detection. Sampling and analytical protocol shall proceed in accordance with NIOSH Method #7102.	OSHA: 0.002 mg/m³, (Ceiling) 0.005 mg/m³ NIOSH: 0.0005 mg/m³ ACGIH: 0.002 mg/m³	No identifiable warning properties to indicate presence and thereby detection. **Recommended APR Cartridge:** Suitable for dust and fume. Organic vapor acid gases with HEPA filter. **Recommended gloves:** This is in the particulate form. Therefore any glove suitable to prevent skin contact (Nitrile has been the one most widely used for the other substances).	**Boiling Pt:** 5378°F; 2970°C **Melting Pt:** 2332°F; 1278°C **Solubility:** Insoluble **Flash Pt:** Not available (Airborne dust may burn or explode when exposed to heat, flame, or incompatible chemicals) **LEL/LFL:** Not available **UEL/UFL:** Not available **Vapor Density:** Not available **Vapor Pressure:** 0 mmHg **Specific Gravity:** 1.85 **Incompatibilities:** Halocarbons, strong oxidizers, acids and caustics **Appearance and odor:** gray to white hard light metal, brittle	Overexposure to this substance may result in respiratory symptoms including difficulty in breathing, coughing, rales, chest pain, possibly pulmonary edema, weakness, fatigue, headache, weight loss. Direct contact may result in irritant action on the skin (dermatitis), eyes (conjunctivae), and mucous membranes. This substance has been identified as a potential human carcinogen.
Chlordane	57-74-9	Substance is not volatile (VP=.00001 mmHg) I.P. is unknown, therefore detection by PID is unknown. Substance is non-combustible, therefore a FID is not expected to have a response to chlordane.	Air sample using Chromosorb-102 sorbent tube with mixed cellulose-ester filter or a xad-2 sorbent tube with filter. Toluene desorption and analysis by gas chromatography-electron capture detector. Sampling and analytical protocol will proceed in accordance with NIOSH Method #5510 or OSHA Method #67.	OSHA; NIOSH; ACGIH: 0.5 mg/m³	Adequate - can use an air purifying respirator with an organic vapor & high efficiency air filter cartridges. **Recommended gloves:** PTFE Teflon for pure product. Nitrile acceptable for incidental contact.	**Boiling Pt:** 347°F; 175°C **Melting Pt:** Not available **Solubility:** Insoluble **Flash Pt:** Not available **LEL/LFL:** Not available **UEL/UFL:** Not available **Vapor Density:** Not available **Vapor Pressure:** 0.00001 mmHg **Specific Gravity:** 1.56 @ 60°F; 15.5°C **Incompatibilities:** Strong oxidizers and alkaline reagents **Appearance and Odor:** Amber-colored, viscous liquid with a pungent, chlorine like odor.	Earliest signs of overexposure manifest as hypersensitivity of the central nervous system characterized by hyperactive reflexes, muscle twitching, tremors, incoordination, ataxia, and clonic convulsions. Cycles of excitement and depression may be repeated over and over. Chronic health hazard information similar to those for DDT.

TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
PAGE 4 OF 6

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Aroclor-1260 (Polychlorinated Biphenyl, PCB) It should be noted that this substance is representative of the more common isomers Aroclor - 1242, 1254, which may be encountered.	11096-82-5 53469-21-9 (42%) 11097-69-1 (54%)	Substance is not volatile (VP=0.00006 mmHg), Ionization Potential is unknown, however, it is anticipated to be elevated. Therefore, the PID is not anticipated to detect this substance. Substance is non combustible and as a result will not be detected by FID.	Air sample using a particulate filter, Florisil sorbent tube with glass fiber filter; hexane desorption; gas chromatography-electron capture detector. Sampling and analytical protocol shall proceed in accordance with NIOSH Method #5503 (PCBs).	OSHA; ACGIH: 0.5 mg/m³ (skin) NIOSH: 0.001 mg/m³ IDLH: 5 mg/m³	Inadequate - However due to the low volatility it is assumed unless agitated this substance does not present a volatile vapor or gas respiratory threat. For dusty conditions where this material may cling to particulates, use a HEPA filter. APRs are approved for escape only when concentrations exceed the exposure limits. Concentrations greater than the exposure limits require PAPR or supplied air respirators. **Recommended glove:** Butyl rubber >24 hrs; Neoprene rubber >24.00 hrs; Silver shield or Viton (for pure product).	**Boiling Pt:** distillation range 689- 734°F; 365-390°C **Melting Pt:** -2 to 50°F; -19 to 10°C **Solubility:** Insoluble **Flash Pt:** Not applicable **LEL/LFL:** Not applicable **UEL/UFL:** Not applicable Nonflammable liquid, however, exposure to fire results in black soot containing PCBs, dibenzofurans, & chlorinated dibenzo-p-dioxins **Vapor Density:** Not available **Vapor Pressure:** 0.00006 - 0.001 mmHg **Specific Gravity:** 1.566 @ 60°F; 15.5°C **Incompatibilities:** Strong oxidizers **Appearance and Odor:** Colorless to pale yellow, viscous liquid or solid (Aroclor 54 below 50°F) with a mild, hydrocarbon odor	This substance is irritating to the eyes and skin. Chronic effects of overexposure may include potential to cause liver damage, chloracne, and reproductive effects. Recognized as possessing carcinogenic properties by NIOSH, and NTP.
Benzo(a)pyrene	50-32-8	Particulate form - This substance is not detectable using a PID or FID.	Air sample using a glass fiber or silver membrane filter; analysis by gas chromatography/infrared or other spectrophotometric method or colorimeter. Sampling and analytical protocol shall proceed in accordance with NIOSH Method 5506 or 5515.	OSHA: 0.2 mg/m³ NIOSH: 0.1 mg/m³	Adequate - use a full-face air-purifying respirator with dust/mist cartridge up to 10 mg/m³. **Recommended glove:** Nitrile	**Boiling Pt:** 594°F; 312°C **Melting Pt:** 354°F; 179°C **Solubility:** Insoluble **Flash Pt:** Not available **LEL/LFL:** Not available **UEL/UFL:** Not available **Vapor Density:** Not available **Vapor Pressure:** 10 mmHg @ 594°F; 312 °C **Specific Gravity:** Not available **Incompatibilities:** Not available **Appearance and Odor:** Yellow odorless crystals.	Regulated primarily as a result of potential carcinogenic properties. Listed by NTP, IARC, and ACGIH as carcinogenic.

TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Creosote / cresol (Fluoranthene, pyrene)	8001-58-9 1319-77-3 (206-44-0)	PID: I.P. of 8.97 eV, relative response ratio unknown. FID: Response factor unknown but given the substance's flammability, detection by FID can be anticipated.	Air sampling for cresol (a major constituent of creosote) by silica gel or xad-7 sorbent tube; Acetone desorption and analysis by gas chromatography - flame ionization detector or high-pressure liquid chromatography. Sampling and analytical protocol shall be in accordance with NIOSH Method #2001, or OSHA Method #32	OSHA; ACGIH: 5 ppm NIOSH: 2.3 ppm IDLH: 80 mg/m³	Adequate - use a full-face air-purifying respirator with organic vapor / dust/mist cartridge up to 250 ppm. Odor threshold of creosol is 0.00005-0.0079 ppm. **Recommended gloves:** Viton >96.00 hrs; butyl rubber >90.00 hrs; neoprene >4.50 hrs	**Boiling Pt:** 376-397°F; 191-203°C **Melting Pt:** 52-96°F; 10.9-35.5°C **Solubility:** Insoluble **Flash Pt:** 178°F; 81°C **LEL/LFL:** Not available **UEL/UFL:** Not available **Vapor Density:** 3.72 **Vapor Pressure:** 1 mmHg @ 100-127°F; 38-53°C **Specific Gravity:** 1.030-1.038 **Incompatibilities:** Nitric acid, oleum, chlorosulfonic acid, oxidizers **Appearance and Odor:** Yellowish or colorless, flammable, oily liquid (often brownish because of impurities or oxidation)	Regulated based on effects on central nervous system, and respiratory system. Acute exposures may result in difficulty breathing, respiratory failure and skin and eye burns. Chronic exposure may damage the liver, kidneys, lungs and skin.
Waste Oils All information is based on mineral oil	Not Established (NE). 8012-95-1 for mineral oil	The Ionization Potential varies between fractions, however, waste oils tend to be less volatile and therfore difficult to detect. The FID tends to handle the longer chained aliphatic hydrocarbons more efficiently than its PID counterpart, and is the instrument of choice.	Sampling and analytical protocol shall be in accordance with NIOSH Method #5026 is the recommended method for mineral oil mist.	ACGIH; NIOSH: 5 mg/m³ (Oil mists); 10 mg/m³ STEL OSHA: 5 mg/m³ (Oil mists)	Non-volatile substance, therefore no respiratory protection is required. In an aerosol form dust and mist respirator would be considered acceptable for up to 500 mg/m³. **Recommended gloves:** Any glove suitable to prevent skin contact (Nitrile has been the one most widely used for the other substances, and will be acceptable).	**Boiling Pt:** 680°F; 360°C **Melting Pt:** Not available **Solubility:** Insoluble **Flash Pt:** 275-500°F; 135-260°C depends on the distillation fraction **LEL/LFL:** Not available **UEL/UFL:** Not available **Vapor Density:** Not available **Vapor Pressure:** <0.5 mmHg **Specific Gravity:** 0.90 **Incompatibilities:** None reported **Appearance and odor:** Colorless, oily, with an odor of burned lubricating oil.	Minor irritation to the eyes, skin, and respiratory system.
Acetone	67-64-1	PID: Ionization Potential 9.69 eV, high response with PID and 10.2 eV lamp. FID: 60 % relative response ratio with FID.	Air sample using a charcoal tube; carbon disulfide desorption; Gas Chromotography/FID detection. Sampling and analytical protocol shall proceed in accordance with OSHA Method #69, 07 or NIOSH Method #1300.	OSHA: 1000 ppm ACGIH: 750 ppm, 1000 ppm STEL NIOSH: 250 ppm IDLH: 2500 ppm	Adequate - Can use air purifying respirator with organic vapor cartridge up to 2500 ppm. **Recommended glove:** Natural rubber	**Boiling Pt:** 133°F; 56°C **Melting Pt:** -139°F; -95°C **Solubility:** Miscible **Flash Pt:** 0°F; -18°C **LEL/LFL:** 2.5% **UEL/UFL:** 13% **Vapor Density:** Not available **Vapor Pressure:** 180 mmHg **Specific Gravity:** 0.79 **Incompatibilities:** Oxidizers, acids **Appearance and odor:** Colorless liquid with a fragrant mint-like odor.	Exposure to this chemical may result in irritation to the eyes, nose, throat. Overexposure may cause headache, dizziness. Contact with the skin may cause dermatitis. Target organs are listed as the respiratory system (lungs) and skin.

TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
PAGE 6 OF 6

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Heptachlor	76-44-8	PID: PID will not detect this substance. FID: FID will not detect this substance.	Sample using a Chrom-102 sorbent tube with toluene desorption. Analyze using Gas chromatography - electron capture detector in accordance with OSHA Method #S287.	OSHA: 0.5 mg/m³ NIOSH: 0.5 mg/m³ ACGIH: 0.05 mg/m³ (skin)	An air purifying respirator equipped with a combination filter for organic vapors, pesticides, and High Efficiency Particulate Air (HEPA) filter is acceptable. **Recommended glove:** Nitrile or neoprene gloves are adequate for protection against contact with the skin.	**Boiling Pt:** 293°F; 145°C **Melting Pt:** 203°F; 95°C **Solubility:** 0.0006% **Flash Pt:** Not available **LEL/LFL:** Not available **UEL/UFL:** Not available **Vapor Density:** Not available **Vapor Pressure:** 0.0003 mmHg **Specific Gravity:** 1.66 **Incompatibilities:** Iron and rust **Appearance and Odor:** White to light tan crystals with a camphor-like odor.	Exposure to this substance may cause tremors, convulsions, and liver damage. Target organs include the Central Nervous System (CNS) and liver. Cases of liver cancer were noted in laboratory animals exposed to heptachlor.

- Loose fitting clothing with long sleeves, where possible (given heat stress considerations) should be worn to provide a barrier between the field person and the insects. Commercially available bug sprays and repellents can be used if necessary. Products such as DEET should not be applied directly to the skin due to potential irritation. This product should be applied over clothing articles. For mosquito infested areas mosquito nets may also be used.

- The FOL and/or the SSO will preview all access routes and work areas in an effort to identify these types of hazards including nesting areas in and around the work sites. These areas will be communicated to all site personnel.

Note: It is important that any allergies be reported on the Medical Data Sheets and to the SSO. Additionally, any specific procedure for administering treatment as directed by your physician, must also be communicated to ensure the quickest and most efficient response possible.

6.3.2 Vector (Ticks, Mosquitoes, etc.) Transmitted Illnesses and Diseases

Ticks and mosquitoes, in this case, are the primary vectors of concern. These insects have been identified in the transmission of various diseases, including Lymes disease and malaria. Warm months (spring through early fall) are the predominant time for this hazard to impact personnel. However, due to the climate and environmental setting or NSWC White Oak, this hazard may occur year-round.

Information concerning vector transmitted Lyme's Disease including recognition, evaluation, tick removal, and control is provided in Section 4.0 of the Health and Safety Guidance Manual.

6.3.3 Snakes And Other Wild Animals

Indigenous animals, including snakes (poisonous and non-poisonous), raccoons, and other animals native to the region may be encountered as part of field operations. Some of the work locations may encroach on nesting areas or territories claimed by these animals.

To avoid the obvious hazards conveyed as part of a direct encounter, the following actions will be taken to minimize impact on field crews and/or site operations.

- The FOL and/or SSO will preview access routes and work locations for nesting areas or signs of animal activities (tracks, foraging areas, etc.). All identified suspect areas will be communicated to the field crews. Where avoidance of these areas, or the animals that inhabit them, is not possible, the relocation of animals and nests will be coordinated with the Maryland Fish and Wildlife Commission.

6.3.3.1 Snake Bites

As stated above, all initial efforts will be directed to avoid, where possible, nesting and territorial areas claimed by these reptiles. However, should field personnel receive a bite, the following actions are necessary.

- Obtain a detailed description of the snake. This and the bite mark will enable medical personnel administering aid to provide prompt and correct antidotes as necessary.

- Immobilize the bite victim to the greatest extent possible. Physical exertion will mobilize the toxins (in poisonous varieties) from the bite point systemically through the body.

- Apply a pressure wrap (for extremities), just above and over the bite area. With a couple wraps of the pressure wrap in place over the bite area, apply a splint, and continue the application of the pressure wrap. The purpose for the splint is to restrict the movement of the extremity; this along with the pressure wrap will aid in restricting the toxins from leaving the site of the bite.

- Seek medical attention immediately.

6.3.4 Poisonous Plants

Various plants that can cause an allergic reaction may be encountered during field work. These include, but are not limited to, poison ivy, poison oak, and poison sumac. Contact may occur when clearing vegetation to gain access to work areas.

Protective measures to control and minimize the effects of poisonous plants include the following:

- Identify plants for field personnel.

  - Poison Ivy plants are characterized by climbing shrubbery, three leaf configuration ovate to elliptical in shape, greenish flowers, and white berries that produce irritating oils.

  - Poison Sumac plants characterized as a tall bush of the sumac family bearing compound leaves (7-13 entire leaflets), branched from a central axis, drooping, with axillary clusters of white fruit producing irritating oils.

- Poison oak plants are characterized as similar to poison ivy consisting of a shrub, stems erect, 0.3 to 2.0 meters tall, leaflets consisting of broad thick lobes coarsely serrated configuration, denser at the base, less so than the top.

- Use of disposable garments such as Tyvek when clearing brush. After use remove and properly dispose of disposable PPE; do not reuse.

- Practice personal hygiene. The oils from the plants will only cause an allergic response when the person's protective skin layer is penetrated. This can be accomplished through pores open when perspiring, or through cuts, nicks, scratches, etc. This can also be accomplished when using excessively hot water for cleaning the skin, which also causes pores to open. Prior to break time wash potentially exposed skin with cool water and soap to remove as much of the oils as possible. In heavily vegetated areas of these plants, additional measures including barrier creams and blocks may be used to prevent the oils from accessing and penetrating the dermal layer.

7.0 TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS

7.1 INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING

This section is included to specify health and safety training and medical surveillance requirements for both TtNUS and subcontractor personnel participating in on site activities.

7.1.1 Requirements for All Field Personnel

All TtNUS and subcontractor personnel who will engage in field associated activities as described in this HASP must have completed 40 hours of introductory hazardous waste site training or equivalent work experience as defined in OSHA Standard 29 CFR 1910.120(e) prior to performing work at the NSWC White Oak facility. Personnel who have had introductory training more than 12 months prior to site work must have completed 8 hours of refresher training within the past 12 months before being cleared for site work. In addition, 8-hour supervisory training in accordance with 29 CFR 1910.120(e)(4) will be required for site supervisory personnel.

Documentation of introductory training or equivalent work experience, supervisory, and refresher training as well as site-specific training will be maintained at the site. Copies of certificates or other official documentation will be used to fulfill this requirement.

TtNUS subcontractors must certify that each employee has had such training or equivalent work experience by sending TtNUS a letter, on company letterhead, containing the information in the example letter provided in Figure 7-1. Training certificates or some other form of official documentation shall accompany this letter for all subcontractor personnel participating in site activities. This letter should be received at least 5 business days prior to the scheduled commencement of site activities.

FIGURE 7-1
TRAINING LETTER

The following statements must be typed on company letterhead and signed by an officer of the company and accompanied by copies of personnel training certificates:

LOGO
XYZ CORPORATION
555 E. 5th Street
Nowheresville, Kansas 55555

Month, day, year

Mr. Scott A. Nesbit, P.E.
Project Manager
Tetra Tech NUS, Inc.
Foster Plaza 7, 661 Andersen Drive
Pittsburgh, Pennsylvania 15220

Subject: HAZWOPER Training for NSWC White Oak, Silver Springs, Maryland

Dear Mr. Nesbit:

As an officer of XYZ Corporation, I hereby state that I am aware of the potential hazardous nature of the subject project. I also understand that it is our responsibility to comply with all applicable occupational safety and health regulations, including those stipulated in Title 29 of the Code of Federal Regulations (CFR), Parts 1900 through 1910 and Part 1926.

I also understand that Title 29 CFR 1910.120, entitled "Hazardous Waste Operations and Emergency Response," requires an appropriate level of training for certain employees engaged in hazardous waste operations. In this regard, I hereby state that the following employees have had 40 hours of introductory hazardous waste site training or equivalent work experience as requested by 29 CFR 1910.120(e) and have had 8 hours of refresher training as required by 29 CFR 1910.120(e)(8) and site supervisory personnel have had training in accordance with 29 CFR 1910.120(e)(4).

LIST FULL NAMES OF EMPLOYEES AND THEIR SOCIAL SECURITY NUMBERS HERE.

Should you have any questions, please contact me at (555) 555-5555.

Sincerely,

(Name and Title of Company Officer)

Enclosure - Copies of training certificates

7.2 Project Specific Training

TtNUS will provide project-specific training to all TtNUS employees and subcontractor personnel who will perform work on this project. A listing of project specific training requirements is as follows:

- Names of personnel and alternates responsible for site safety and health
- Safety, health and other hazards present on site
- Use of personal protective equipment
- Work practices to minimize risks from hazards
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure to site contaminants
- The contents of the site-specific HASP
- Use and application of the Safe Work Permits
- Emergency response procedures (evacuation and assembly points)
- Review the contents of relevant Material Safety Data Sheets
- Relevant NSWC White Oak policies and procedures while on-site

Figure 7-2 will be used to document the provision of the project-specific training. All site personnel will be required to sign this form prior to commencement of site activities.

7.3 MEDICAL SURVEILLANCE

7.3.1 Medical Surveillance Requirements for TtNUS and Subcontractor Personnel

All TtNUS and subcontractor personnel participating in project field activities will have had a physical examination. All physical examinations shall meet the minimum requirements of paragraph (f) of OSHA 29 CFR 1910.120. All personnel will be medically qualified to perform hazardous waste site work using respiratory protection.

Documentation for medical clearances will be maintained at the job site and made available, as necessary. The "Subcontractor Medical Approval Form" provided in Figure 7-3 can be used to satisfy this requirement, providing it is properly completed and signed by a licensed physician. This approval form should be accompanied by a letter, on company letterhead, containing all of the information in the example letter presented in Figure 7-4 of this HASP.

7.3.2 Requirements for All Field Personnel

Each field team member, including subcontractors and visitors, entering the exclusion zone(s) shall be required to complete and submit a copy of the Medical Data Sheet found in the TtNUS Health and Safety Guidance Manual. This shall be provided to the SSO, prior to participating in site activities. The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention.

7.4 SUBCONTRACTOR EXCEPTION

In situations in which the exclusion zone is not entered or when there is no potential for exposure to site contaminants, subcontractor personnel may be exempt from some of the training and medical surveillance requirements. All subcontractors and visiting personnel are required to receive site-specific training (as discussed in Section 7.2) regarding information provided in this HASP. Examples of subcontractors who may be exempt from training and medical surveillance requirements may include surveyors who perform surveying activities in site perimeter areas or areas were there is no potential for exposure to site contaminants. **Use of this Subcontractor exception is strictly limited to the authority of the CLEAN Health and Safety Manager.**

FIGURE 7-2

SITE-SPECIFIC TRAINING DOCUMENTATION

My signature below indicates that I am aware of the potentially hazardous nature of performing investigation activities at NSWC White Oak, and that I have received project-specific training which included the elements presented below:

- Names of personnel and alternates responsible for site safety and health
- Safety, health and other hazards present on site
- Use of personal protective equipment
- Work practices to minimize risks from hazards
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure
- The contents of the health and safety plan
- The use and application of the Safe Work Permit
- Emergency response procedures (evacuation and assembly points)
- Review contents of relevant Material Safety Data Sheets
- Review of relevant NSWC White Oak policies and procedures

I further state that I have been given the opportunity to ask questions and that all of my questions have been answered to my satisfaction.

I further state, by the presence of my signature below that the date of my training (introductory, refresher, and supervisory, as applicable) and my medical surveillance requirements are accurate and correct to the best of my knowledge.

Name	40-Hour General Site Worker Training (Date)	8-Hour Refresher Training (Date)	8-Hour Supervisory Training (Date)	Medical Surveillance	SIGNATURE

FIGURE 7-3
SUBCONTRACTOR MEDICAL APPROVAL FORM

For employees of _____
Company Name

Participant Name: _____ Date of Exam: _____

Part A

The above-named individual has:

1. Undergone a physical examination in accordance with OSHA Standard 29 CFR 1910.120, paragraph (f), and was found to be medically -

( ) qualified to perform work at the NSWC White Oak work site
( ) not qualified to perform work at the NSWC White Oak work site

and,

2. Undergone a physical examination in accordance with OSHA 29 CFR 1910.134(b)(10) and was found to be medically -

( ) qualified to wear respiratory protection
( ) not qualified to wear respiratory protection

My evaluation has been based on the following information, as provided to me by the employer.

( ) A copy of OSHA Standard 29 CFR 1910.120 and appendices.
( ) A description of the employee's duties as they relate to the employee's exposures.
( ) A list of known/suspected contaminants and their concentrations (if known).
( ) A description of any personal protective equipment used or to be used.
( ) Information from previous medical examinations of the employee that is not readily available to the examining physician.

Part B

I, _____, have examined _____
Physician's Name (print) Participant's Name (print)

and have determined the following information:

FIGURE 7-3
SUBCONTRACTOR MEDICAL APPROVAL FORM
PAGE TWO

1. Results of the medical examination and tests (excluding findings or diagnoses unrelated to occupational exposure):

_____
_____
_____

2. Any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health:

_____
_____
_____

3. Recommended limitations upon the employee's assigned work:

_____
_____
_____

I have informed this participant of the results of this medical examination and any medical conditions which require further examination or treatment.

Based on the information provided to me, and in view of the activities and hazard potentials involved at the NSWC White Oak, Silver Springs, Maryland work site, this participant

( ) may
( ) may not

perform his/her assigned task.

Physician's Signature _____

Address _____

Phone Number _____

NOTE: Copies of test results are maintained and available at:

_____
Address

FIGURE 7-4
MEDICAL SURVEILLANCE LETTER

The following statements must be typed on company letterhead and signed by an officer of the company:

LOGO
XYZ CORPORATION
555 E. 5th Street
Nowheresville, Kansas 55555

Month, day, year

Mr. Scott A. Nesbit, P.E.
Project Manager
Tetra Tech NUS, Inc.
Foster Plaza 7, 661 Andersen Drive
Pittsburgh, Pennsylvania 15220

Subject: Medical Surveillance for NSWC White Oak, Silver Springs, Maryland

Dear Mr. Nesbit:

As an officer of XYZ Corporation, I hereby state that the persons listed below participated in a medical surveillance program meeting the requirements contained in paragraph (f) of Title 29 of the Code of Federal Regulations (CFR), Part 1910.120, entitled "Hazardous Waste Operations and Emergency Response." I further state that the persons listed below have had physical examinations under this program within the past 12 months and that they have been cleared, by a licensed physician, to perform hazardous waste site work and to wear positive- and negative-pressure respiratory protection. I also state that, to my knowledge, no person listed below has any medical restriction that would preclude him/her from working at NSWC White Oak, Silver Springs, Maryland work site.

LIST FULL NAMES OF EMPLOYEES AND THEIR SOCIAL SECURITY NUMBERS HERE.

Should you have any questions, please contact me at (555) 555-5555.

Sincerely,

(Name and Title of Company Officer)

8.0 SPILL CONTAINMENT PROGRAM

8.1 SCOPE AND APPLICATION

It is not anticipated that quantities of bulk potentially hazardous materials (greater than 55 gallons) will be handled during some of the site activities conducted as part of the scope of work. Significant quantities of waste water (decontamination) and Investigative-Derived Wastes (IDW) may be generated as part of site activities. It is not anticipated, however, that spillage of these materials would constitute a significant danger to human health or the environment. Further, it is possible that, as the job progresses, disposable PPE and other non-reusable items may be generated. As needed, 55 -gallon drums will be used to contain waste waters, IDW, and other unwanted items generated during investigatory activities. These drums will be labeled as follows:

- Site name, SWMU or other designation
- Location(s) – where wastes were generated
- Date – (Note: Date the drum only once it is full and not during the filling cycle)
- Drum number
- The type of contents (purge waters, soils, decontamination water)
- Volume
- Point of contact with telephone number.

An updated Inventory Log will be provided to the Base Contact (Mr. Bob Ridgway) and to the PM at the termination of every 10-day shift. This will be done to keep a running tab of containers retained within an established marshaling area.

Samples will be collected and analyzed to characterize the material and determine appropriate disposal measures. Once characterized, they can be removed from the staging area and disposed of in accordance with Federal, State and local regulations.

8.2 POTENTIAL SPILL AREAS

Potential spill areas will be monitored in an ongoing attempt to prevent and control further potential contamination of the environment. Currently, there are various areas vulnerable to this hazard including the following:

- Areas used for central staging of resources
- Areas used for central staging of IDW materials
- Decontamination area

Additionally, areas designated for handling, loading, and unloading of potentially contaminated soils, waters, and debris present limited potential for leaks or spills. Monitoring of these areas will be done at least weekly.

8.2.1 Site Drums/Containers

All drums/containers used for containing soils and liquids will be sealed, labeled, and staged within a centralized area awaiting shipment or disposal. Drums used for the storage and transportation of IDW will meet the packaging requirements for steel drums category U.N. 1A2, removable head as specified in paragraph 9.6.1, United Nations Transport of Dangerous Goods.

8.2.1.1 Staging Area Configuration

The staging or marshaling area, as referred to before, will be configured to support this spill prevention and control program. The area will be configured as follows:

- Where possible, secondary containment should be provided. This would include a bermed area sufficient in size to hold 10% of the total volume or the volume of largest container, whichever is greater. This calculation of secondary containment should also consider any displacement by containers or pallets. This bermed area should be lined (plastic liner or other impermeable surface) to prevent any spillage inside the containment from saturating the ground.

- Drums will be organized no more than four to a pallet. The drums label and the head bolt arranged as such to permit reading/review or removal of the head without requiring the drum to be moved on the pallet. Drums will be segregated to site and media. A minimum of two feet shall be maintained between each row of pallets to permit access for spill response measures.

8.3 LEAK AND SPILL DETECTION

To establish an early detection of potential spills or leaks, a periodic (once a week) walk around by the SSO will be conducted during working hours to visually determine that containers are not leaking. If a leak is detected, the first approach will be to transfer the container contents using a hand pump into a new

container. Other provisions for the transfer of container contents will be made and appropriate emergency contacts will be notified, if necessary. In most instances, leaks will be collected and contained using absorbents such as Oil-dry, vermiculite, or sand, which will be stored at the staging area in a conspicuously marked drum. This material, too, will be containerized for disposal pending analyses. All inspections will be documented in the Project Logbook.

8.4 PERSONNEL TRAINING AND SPILL PREVENTION

All personnel will be instructed on the procedures for spill prevention, containment, and collection of hazardous materials in the site-specific training. The FOL and/or the SSO will serve as the Spill Response Coordinator for this operation should the need arise.

8.5 SPILL PREVENTION AND CONTAINMENT EQUIPMENT

The following represents the minimum equipment which will be maintained at the staging area at all times for the purpose of supporting this Spill Prevention/Containment Program.

Spill Response Equipment:

- Sand, clean fill, vermiculite, or other noncombustible absorbent (oil-dry);
- Drums (55-gallon U.N 1A2)
- Portable storage tanks or additional drums
- Shovels, rakes, and brooms
- Labels

PPE stored at the staging area:

- Rubber boot covers, nitrile outer gloves, PVC rain-suit or other form of impermeable splash protection, should it be required.

8.6 SPILL CONTROL PLAN

This section describes the procedures the TtNUS field crew members will employ upon the detection of a spill or leak.

1) Notify the SSO or FOL immediately upon the detection of a leak or spill.

2) Employ the personnel protective equipment stored at the staging area. Take immediate actions to stop the leak or spill by plugging or patching the drum or raising the leak to the highest point. Spread the absorbent material in the area of the spill, covering completely.

3) Transfer the material to a new container, collect and containerize the absorbent material. Label the new container appropriately. Await analyses for treatment or disposal options.

4) All spills occurring on soils, grassy areas, gravel lots will be re-containerized including 2-inches of top cover on which the spill occurred, and await test results for treatment or disposal options.

It is not anticipated that a spill will occur in which the field crews cannot handle. Should this occur notification of appropriate emergency response agencies will be carried out by the FOL or SSO.

9.0 SITE CONTROL

This section outlines the means by which TtNUS will delineate work zones and use these work zones in conjunction with decontamination procedures to prevent the spread of contaminants into previously unaffected areas of the site. It is anticipated that a three-zone approach will be used during work at this site. This three zone approach will utilize an exclusion zone, a contamination reduction zone, and a support zone. It is also anticipated that this control measure will be used to control access to site work areas. Use of such controls will restrict the general public, minimize the potential for the spread of contaminants, and protect individuals who are not cleared to enter work areas.

9.1 EXCLUSION ZONE

The exclusion zone will be considered those areas of the site of known or suspected contamination. It is not anticipated that significant amounts of surface contamination are present in the proposed work areas of this site. Therefore, the exclusion zones for this project will be limited to those areas of the site where active work is being performed plus a designated area surrounding the point of operation (see Table 5-1 for specific operation).

Site 1/SWMU 3 – Parking Lot Landfill:

- Test Pit Operations – Physical barriers will be established to include the pit under construction, and the maximum swing of the boom plus 3 feet. Access points for ground personnel will only be permitted from routes visible to the operator. Ground personnel will be permitted to approach the trenches to a proximity of 2 feet from the edge. This distance may be increased depending on the soil and/or fill classification in accordance to 29 CFR 1926.650.

Surface and subsurface soil sampling (by hand):

- Five (5) feet circumference surrounding the point of operation.

Site 28/SWMU 88 – Building T-14 Scrap-yard:

- Five (5) feet circumference surrounding the point of operation.

When necessary, exclusion zones will be delineated using barrier tape, cones and/or drive poles, and postings to inform personnel other than the field crew.

9.1.1 Exclusion Zone Clearance

Prior to the initiation of site activities, utility locations will be identified by commercial utility location companies [Maryland One-Call System – Miss Utilities (800)257-7777] and drawings made available through the NSWC White Oak Contact (Mr. Robert Ridgway). The positions of identified utilities will be field located and staked, to minimize the potential for damage during intrusive activities. Sample locations can be located to avoid buried utilities. In the event that a utility is struck during a subsurface investigative activity, the emergency numbers provided in Section 2.9 and Table 2-1 will be notified.

Access to work areas will be controlled by TtNUS personnel. No persons will be permitted to enter site exclusion zones without site-specific training. Site visitors will be provided site-specific training and will be escorted by TtNUS personnel at all times (see Section 9.4).

9.2 CONTAMINATION REDUCTION ZONE

The contamination reduction zone (CRZ) will be a centralized area used for decontamination of equipment. This area was established and controlled for the purpose of equipment decontamination and IDW storage. Equipment transported to this location will be required to be wrapped in plastic or bagged for the transport. Limited decontamination will take place at the exclusion zone. This will be done to remove mud from tires, boots, etc., for the purpose of minimizing tracking mud and potential contaminants outside the exclusion zone.

9.3 SUPPORT ZONE

The support zone for this project will include a staging area where site vehicles will be parked, equipment will be unloaded, and where food and drink containers will be maintained. In all cases, the support zones will be established at areas of the site where exposure to site contaminants would not be expected during normal working conditions or foreseeable emergencies.

9.4 SITE VISITORS

Site visitors for the purpose of this document are identified as representing the following groups of individuals:

- Personnel invited to observe, or participate in, operations by TtNUS
- Regulatory personnel (EPA, OSHA, etc.)
- NSWC White Oak or DOD Personnel
- Other authorized visitors

All personnel working on this project are required to gain initial access to the NSWC White Oak by coordinating with the TtNUS FOL or designee and following established NSWC White Oak access procedures.

Once access to NSWC White Oak is obtained, all personnel who require site access into areas of ongoing operations will be required to obtain permission from the FOL and SSO. The prerequisites for all site visitors wishing to observe operations in progress in the exclusion zone are discussed below:

- All site visitors will be routed to the FOL, who will sign them into the field logbook. Information to be recorded in the logbook will include the individual's name (proper identification required), the entity which they represent, and the purpose of the visit.

- All site visitors will be required to produce the necessary information supporting clearance to the site. This shall include information attesting to applicable training (40-hours of HAZWOPER training) and medical surveillance as stipulated in Section 7.0 of this document. In addition, to enter the site operational zones during planned activities, all visitors will be required to first go through site-specific training covering the topics stipulated in Section 8.2 of this HASP.

Once the site visitors have completed the above items, they will be permitted to enter the operational zone. All visitors are required to observe the protective equipment and site restrictions in effect at the site at the time of their visit. Any and all visitors not meeting the requirements stipulated in this plan will not be permitted to enter the site operational zones during planned activities. Any incidence of unauthorized site visitation will cause the termination of all on-site activities until the unauthorized visitor is removed from the premises. Removal of unauthorized visitors will be accomplished with support from the Base Contact and GSA Physical Security. All site visitors granted access to the exclusion zones during ongoing operations will be escorted by a TtNUS representative (arranged for by the FOL) at all times while the visitor remains in the exclusion zone.

9.5 SITE SECURITY

TtNUS will retain control over active operational areas. The FOL will serve as a focal point for site personnel, and will serve as the final line of security for the work areas. As stated above, all work will cease in the event of unauthorized personnel entering the exclusion zone. Work will remain temporarily suspended until the unauthorized visitor can be removed. The Base Contact will serve as the primary enforcement contact for removing unauthorized visitors.

9.6 SITE MAP

Once the areas of contamination, access routes, utilities, topography, and dispersion routes are determined, a site map will be generated and adjusted as site conditions change. These maps will show utility locations, potential points of contact with the public, roadways, and other significant characteristics that may impact site operations and safety. Site maps will be posted to illustrate up-to-date collection of contaminants and adjustment of zones and access points.

9.7 BUDDY SYSTEM

Personnel engaged in on-site activities will practice the "buddy system" to ensure the safety of all personnel involved in this operation.

9.8 MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS

TtNUS and subcontractor personnel will provide MSDSs for all chemicals brought on-site. The contents of these documents will be reviewed by the SSO with the user(s) of the chemical substances prior to any actual use or application of these substances on site. A chemical inventory of all chemicals used on site will be developed. The MSDSs will then be maintained in a central location and will be available for anyone to review upon request.

9.9 COMMUNICATION

As personnel may not always be working in proximity to one another during field activities, a supported means of communication between field crews will be used as necessary. As a result, two-way radio communication devices will be used by field personnel while at the site. All two-way radio communications intended for use at NSWC White Oak, will have GSA approval prior to being brought on-site for use.

External communication will be accomplished by using provided telephones at the site or cellular telephones. External communication will primarily be used for the purpose of resource and emergency resource communications.

9.10 SAFE WORK PERMITS

All exclusion zone work conducted in support of this project will be performed using SWPs to guide and direct field crews on a task-by-task basis. An accompanying support binder containing materials and documentation required on-site includes partially completed SWP for tasks that are to be performed as part of the investigation. Information, such as field crew performing the task, date, time, procedure reviews, and equipment preparation information, need to be completed by the FOL or SSO prior to the

initiation of site activities. SWPs will be further supported by the daily safety meetings. This effort will ensure all site specific considerations and changing conditions are incorporated into the planning effort. All permits will require the signature of the FOL and/or SSO. All personnel engaged in on-site activities will be aware of the elements indicating levels of protection and precautionary measures to be used.

Use of these permits will provide the communication line for reviewing protective measures and hazards associated with each operation. This HASP will be used as the primary reference for selecting levels of protection and control measures. The SWP will take precedence over the HASP when more conservative measures are required based on specific site conditions.

Upon completion of work specified on the SWP, the person accepting the permit will return it to the SSO.

Any problems encountered regarding control measures taken will be annotated on the permit or a separate sheet of paper and returned to the SSO for review and evaluation.

10.0 CONFINED SPACE ENTRY

It is not anticipated, under the proposed scope of work, that confined space and/or permit-required confined space activities will be conducted. **Therefore, personnel under the provisions of this HASP are not allowed, under any circumstances, to enter confined spaces.** A confined space is defined as an area which has one or more of the following characteristics:

- Is large enough and so configured that an employee can bodily enter and perform assigned work.
- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).
- Is not designed for continuous employee occupancy.

A Permit-Required Confined Space is one that:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential to engulf an entrant.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
- Contains any other recognized, serious, safety or health hazard.

Under no circumstances are personnel to enter the test pits. These pits would be considered Permit-Required Confined Spaces.

For further information on confined space, consult the Health and Safety Guidance Manual or call the PHSO. If confined space operations are to be performed as part of the scope of work, detailed procedures and training requirements will have to be addressed and this HASP modified accordingly.

11.0 MATERIALS AND DOCUMENTATION

The TtNUS FOL shall ensure the following materials/documents are taken to the project site and used when required:

- A complete copy of this HASP
- Health and Safety Guidance Manual
- Incident Reports/OSHA 101 Form
- Medical Data Sheets
- Material Safety Data Sheets for all chemicals brought on site, including decon solutions, fuels, sample preservatives, calibration gases, etc.
- A full-size OSHA Job Safety and Health Poster (posted in the site trailers)
- Training/Medical Surveillance Documentation Form (Blank)
- First-Aid Supply Usage Form
- Equipment Inspection Forms
- Equipment Calibration Forms
- Emergency Reference Form (Section 2.0, extra copy for posting)

11.1 MATERIALS TO BE POSTED AT THE SITE

The following documentation is to be posted at the site for quick reference purposes. In situations where posting of these documents is not feasible (such as no office trailer), these documents should be separated and immediately accessible.

Chemical Inventory Listing - This list represents all chemicals brought on site, including decontamination solutions, sample preservatives, fuel, calibration gases, etc.. This list should be posted in a central area.

Material Safety Data Sheets (MSDSs) - The MSDSs should also be in a central area accessible to all site personnel. These documents should match all the listings on the chemical inventory list for all substances employed on site. It is acceptable to have these documents within a central folder and the chemical inventory as the table of contents.

The OSHA Job Safety & Health Protection Poster - This poster, as directed by 29 CFR 1903.2 (a)(1), should be conspicuously posted in places where notices to employees are normally posted. Each FOL shall ensure that this poster is not defaced, altered, or covered by other material.

Site Clearance Posting - This list is found within the training section of the HASP (See Figure 8-1). This list identifies all site personnel, dates of training (including site-specific training), and medical surveillance. This lists indicates not only clearance, but also status. If personnel do not meet these requirements, they do not enter the site while site personnel are engaged in activities.

Emergency Phone Numbers and Directions to the Hospital(s) - This list of numbers and the directions will be maintained at all phone communications points and in each site vehicle.

Medical Data Sheets/Cards - Medical Data Sheets will be filled out by all on-site personnel and filed in a central location. The Medical Data Sheet will accompany any injury or illness requiring medical attention to the medical facility. A copy of this sheet or a wallet card will be given to all personnel to be carried on their person.

Hearing Conservation Standard (29 CFR 1910.95) - This standard will be posted anytime hearing protection or other noise abatement procedures are employed.

Personnel Monitoring - All results generated through personnel sampling (levels of airborne toxics, noise levels, etc.) will be posted to inform individuals of the results of that effort.

Placards and Labels - Where chemical inventories have been separated because of quantities and incompatibilities, these areas will be conspicuously marked using Department of Transportation (DOT) placards and acceptable [Hazard Communication 29 CFR 1910.1200 (f)] labels.

These items have been gathered and provided for the FOL/SSO in a three ring-binder for easy access and reference in the above areas.